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Yana van der Meulen Rodgers
Nidhiya Menon

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Yana van der Meulen Rodgers

Rutgers University

Nidhiya Menon

*Brandeis University
and IZA*

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IZA

P.O. Box 7240
53072 Bonn
Germany

Phone: +49-228-3894-0

Fax: +49-228-3894-180

E-mail: iza@iza.org

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ABSTRACT

Impact of the 2008-2009 Food, Fuel, and Financial Crisis on the Philippine Labor Market^{*}

This study examines how the 2008-2009 surges in international food and fuel prices and coinciding global financial crisis impacted the Philippine labor market, with a focus on gendered outcomes. A battery of descriptive statistics and probit regressions based on repeated cross sections of the Philippine Labor Force Survey indicate that both men and women experienced declines in the likelihood of employment, especially in 2008 and in manufacturing. While men's job losses were limited to wage employment, women lost job opportunities in wage- and self-employment, and they experienced increases in unpaid family work. Real wages fell for men and women, with much of the decline at the upper tails of the wage distribution. If one considers education as a proxy for skill, results suggest that unskilled workers were affected most adversely when the crisis began, especially in terms of employment losses, but as the crisis conditions wore on, skilled workers experienced negative impacts as well, especially in terms of real wage cuts.

JEL Classification: J31, J24, O12

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Corresponding author:

Yana van der Meulen Rodgers
Women's and Gender Studies Department
Rutgers University
New Brunswick, NJ 08901
USA
E-mail: yrodgers@rci.rutgers.edu

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I. Introduction

The global financial crisis has resulted in considerably slower economic growth in the Philippines, as elsewhere in East Asia. Real annual GDP growth decelerated after 2007 but remained positive, unlike the 1997-1998 Asian financial crisis when the Philippine economy contracted. In particular, GDP growth in 2008 slowed to 4 percent down from an average rate of 5 percent between 2003 and 2006 and 7 percent in 2007 (the highest growth since the mid-1980s). The reduction in global demand caused industrial production in the Philippines to slow down in 2008 and decrease in 2009, especially in manufacturing industries. 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. Reports indicate that the top-ten export products together accounted for three-quarters of total export revenues, and in 2009, export earnings declined by about a quarter compared to 2008 (NSO 2010a).¹

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.* 2009; Yap *et al.* 2009).² Hence, some of the negative impacts in the Philippines may have been reduced as a consequence of the remittance flows from abroad.

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. 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 an 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. Evidence in Reyes *et al.* (2010) suggests that these price increases served as the main transmission mechanism for the food and fuel crisis 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.

A crisis assessment analysis undertaken by the World Bank indicates that poor households were hit harder than richer ones by the crisis, bearing disproportionate labor market setbacks (ASEAN 2009). Because remittance amounts have remained steady, any declines in household incomes are likely to arise from losses in employment and wages. With the manufacturing sector bearing the most severe initial impacts due to the declining global demand, such losses are expected to show most strongly in the manufacturing 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, female workers in the Philippines may have experienced greater negative pressures on employment and wages as compared to male workers. The food, fuel, and financial crisis is likely to have caused spillover

effects in sectors outside of manufacturing as domestic demand for goods and services fell. In addition, vulnerable households may have tried to cope by increasing their indebtedness, selling their productive assets, or by investing less in human capital by withdrawing children from school. Such second-round effects are projected to last into the future (World Bank 2009).

The probability of crisis impacts lasting into the future becomes more compelling upon considering past trends in the Philippine labor market following the 1997-1998 Asian financial crisis. Although GDP growth in the Philippines recovered substantially, from -3 percent in 1998 to about 4 percent in 2001, the unemployment rate remained stubbornly high at about 10 to 11 percent (Albuero 2002). This period is known as the time of “jobless growth” in the Philippines’ formal industrial sector and is attributed mainly to high labor standards and capital-intensive production techniques (Sibal 2005). Hence, given existing fundamentals in the Philippine labor market, economic recovery from the food, fuel and financial crisis of 2008-2009 may not necessarily be accompanied immediately by rapid improvements in formal sector employment.

These issues provide strong motivation for further exploration of crisis impacts in the labor market, with a focus on employment and wage effects. We conduct this more detailed exploration using a large set of labor market indicators based on published aggregate data as well as micro-data from quarterly waves of the Philippine Labor Force Survey. Although the methodology utilizes regression techniques, the results are descriptive in nature. We would need a convincing counterfactual in order to be able to argue that these effects were caused by the food, fuel, and financial crisis (Son and San Andres 2009). That is, we would need a robust measure of how the Philippine economy would have evolved in the absence of this crisis; with such a measure, we would be able to compare the actual value of the economic variables to those from the counterfactual and attribute the difference to the impact of the food, fuel, and financial

crisis. Unfortunately, constructing a long-term counterfactual requires more data than we currently have – using just four quarters of the Labor Force Survey data from 2007 (the pre-crisis period) is insufficient to generate a credible estimate of how the economy might have evolved if the food, fuel, and financial crisis had not occurred.

Regression estimates indicate that relative to 2007, the likelihood of employment declined by about 1 to 2 percent for both men and women as a result of the food and fuel price crisis and remained at the relatively lower levels during the financial crisis. Most of the declines for men came from wage-employment (especially in low-pay jobs), while women lost jobs in both wage- and self-employment. Moreover, job losses appear to have disproportionately hit the manufacturing sector as well as more vulnerable members of society, particularly unskilled workers and women. Women also saw increases as unpaid family workers, especially during the financial crisis. In a broader context, however, the 2008-2009 food, fuel, and financial crisis did not appear to hit the Philippines as hard as the 1997-1998 Asian shock, when workers saw substantially larger cuts in employment.

Men and women also experienced large wage declines as a result of the food, fuel, and financial crisis. Compared to 2007, men's overall real wages dropped by 3 percent and women's overall real wages dropped 2 percent in response to the food and fuel price crisis. Real wages during the financial crisis remained about 4 percent lower for men and 3 percent lower for women relative to 2007, implying back-to-back shocks for workers' real wages. 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 most sectors of the economy, they were particularly sharp for women in manufacturing and agriculture, and for men in other heavy industries (primarily construction). In

interpreting the employment and wage results together and considering the correlation between education and skill, the results suggest that unskilled workers may have suffered relatively more in terms of employment losses, especially during the food and fuel price crisis, whereas skilled workers may have experienced relatively greater declines in real wages, especially during the financial crisis.

II. Data and Methods

The study uses both aggregate-level data and micro-data for the labor market. The aggregate data, drawn primarily from the International Labor Organization's on-line database, provide a long time series through 2008 (ILO various years). These aggregate data are used for a set of descriptive analyses that allow us to describe a historical context for the food, fuel, and financial crisis. The micro-data come 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 its official labor market indicators. We perform the assessment using both descriptive and regression-based techniques. Note that both these data sources specifically cover market-based work and ignore 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 turn to previous time use studies for the Philippines and examine related categories in the Labor Force Survey: specifically, 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 the first half of 2009.³ Our employment sample retains all individuals ages 15 to 65 with observed values for the key

regressors, resulting in a total of 623,276 observations for men and 605,587 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 drops the self-employed who earn zero wages. Nominal daily wage rates are deflated using regional CPI data published by the Philippines National Statistics Office, where we constructed quarterly averages of the published monthly CPI deflators to convert nominal to real values (NSO 2010b).

In the regression analysis for employment, we used the pooled sample 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 began by specifying 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, which include 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 (for example, the first half of 2009) relative to the excluded time dummy (in our case, the first half of 2007). Finally, ϑ_{it} is the error term. Given the binary nature of the dependent variable, we employed a probit model to estimate the standard

labor supply model in equation (1). The paper reports marginal effects of the probit coefficients and their bootstrapped standard errors.⁴

We started the regression analyses for wages by examining the gender wage gap during the crisis period, with controls 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. The notation ε is a random error term assumed to be normally distributed with variance σ^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 weights correct for the fact that the proportion of individuals and households in each sample differs from the proportion in the true population. 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 food, fuel, and financial crisis 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:

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

As before, the notation w_i denotes the natural logarithm of real wages for the sample of men and women, and X_i is the matrix of observed characteristics. Now β_θ 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 θ 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 θ , the coefficients β_θ can be estimated by solving the following minimization problem:

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

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 θ 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 β_{θ} is then interpreted as the marginal change in the θ th conditional quantile of wages due to a marginal change in the regressor of interest. The results table reports the quantile coefficients and bootstrapped standard errors.

III. Employment

A. Employment Changes During the Crisis

The 2008-2009 food, fuel, and financial crisis entailed substantial shifts in employment and changes in the nature of work, with disproportionate job losses for women overall and for individuals with less education, as well as greater unpaid work for women. As shown in Figure 1, women and men with only some elementary school education were particularly vulnerable to employment losses after 2007 as the Philippine economy experienced the food and fuel price crisis, with a small rebound during the financial crisis.⁵ Individuals with some high school also experienced employment declines during the food and fuel crisis relative to 2007, again with some rebound during the financial crisis, but the losses for men were considerably smaller in scale than those for women. Both women and men with high school degrees and college educations, in aggregate, were spared the employment losses that their counterparts with relatively less education experienced. If one were to consider education as a proxy for skill, these results could be interpreted as an indication that unskilled workers, and especially unskilled

female workers, were more vulnerable than skilled workers to job losses following the food and fuel price crisis.

Insert Figure 1 Here.

A similar analysis by sector of production rather than education groups indicates disproportionate job losses for both men and women in manufacturing during the food and fuel crisis relative to the prior year, with additional losses during the financial crisis (Figure 2). In particular, women's manufacturing-sector employment dropped by about 62,000 jobs during the food and fuel crisis relative to 2007, which amounts to about a 5 percent drop in manufacturing sector jobs. During the financial crisis, women had 107,000 fewer jobs in manufacturing relative to 2007, about an 8 percent decline. For men, the respective percentage declines amounted to 4 percent and 6 percent. The intensification of employment losses in the manufacturing sector during the financial crisis is consistent with the argument that declining global demand for manufactured exports during the financial crisis is likely to have caused substantial employment losses in the Philippines. That these manufacturing-sector job losses were biased toward women suggests that female workers experienced relatively greater negative pressures on employment as a result of declines in mass-produced, low-cost manufactured exports, the production of which tends to employ more women than men.

Insert Figure 2 Here.

This analysis by sector of production also shows that women saw employment losses in agriculture and in services during the food and fuel crisis, with some rebound during the financial crisis. A closer look at the service sector data shows that women's service-sector losses during the food and fuel crisis included jobs that involved private household work in positions such as nannies and maids. This finding makes intuitive sense in the context of middle and upper

income families giving up the luxury of paid household help as they experienced losses in household earnings and higher consumer prices. In aggregate, men's job losses were limited to manufacturing in both years.

The back-to-back food, fuel, and financial crises have also had varying effects on different types of workers in the formal, informal, and household sectors. Historically, proportionately more women in the Philippines have worked in the informal sector compared to men: since 1998, 48 percent of employed women have held informal sector jobs, compared to 43 percent of men (ILO various years).⁶ Although the distribution between the formal and informal sector remained quite stable for the earlier part of the decade, the crisis period has put some pressure on increased informalization, especially for women. As shown in Figure 3, in aggregate, women lost jobs as wage and salaried workers and as self-employed workers during the food and fuel crisis relative to 2007, while men saw increases in both these categories of work. This decline in self-employment opportunities for women, which abated somewhat during the financial crisis, is consistent with a story of reduced demand for the small-scale products and services that women tend to sell. A more detailed breakdown of these self-employment declines during the food and fuel crisis indicates that they were concentrated in agriculture and services. During the financial crisis, women's self-employment opportunities in services rebounded, but women's self-employment in agriculture dropped to even lower levels.

Insert Figure 3 Here.

Figure 3 also shows that both men and women lost jobs as employers during both crises. Instead, employment in unpaid family work increased for men and women in both crises relative to 2007. The increases for women were considerably larger than those for men, especially during the financial crisis, when the number of female unpaid family helpers rose by 192,000 relative to

2007. This increase amounts to a 9 percent increase for women, compared to 4 percent for men. During times of hardship, households rely on employment in this category of work as a coping mechanism — the trends in the Philippine labor market during the crisis period are consistent with this idea. A closer look at these employment figures for unpaid family workers indicates that virtually all of the increase for women and men in both years occurred in the agricultural sector.

Women's relatively greater responsibility in performing unpaid domestic work helps to explain other trends in the Philippine labor market during the crisis. For example, rates of underemployment — the proportion of employed workers who want more hours of work — increased noticeably for both men and women in 2008 at the height of the food and fuel price crisis, and they were higher for men than women. One could reasonably argue that women's time constraints due to their heavier responsibility in performing unpaid domestic work prevented them from formally claiming that they desired additional paid work. In addition, due to differences in preferences and in how people express their dissatisfaction with work, women may appear to be more satisfied than men with their jobs and not formally desire additional work (Hodson 1989). A similar argument may be made about workers holding two or more paid jobs. In the Philippines, this indicator rose noticeably in the second half of 2008 and was higher for men than women.

Previous studies for the Philippines based on time use surveys clearly indicate that women perform a greater share of unpaid domestic work compared to men. In particular, time use data from the mid- to late-1970s indicate that men work 452 minutes/day in total, predominantly (84 percent) in market work, while women work 546 minutes/day in total, predominantly (71 percent) in non-market work (UNDP 1995; World Bank 2001). Findings

based on time use data from the 1980s suggest that mothers bear over 90 percent of the time costs of raising a young child in families with no older children, and about 50 percent of the time costs in families with older children. In addition, first-time mothers work significantly less in the labor market in the first 14 months after childbirth compared to pre-childbirth, and husbands have more leisure (about 30 – 40 hours per week) than wives if there is at least one small child in the household (Tiefenthaler 1997). Furthermore, results in Adair *et al.* (2002) covering the 1983-1991 period indicate that women with young children see a statistically significant reduction in cash earnings compared to women with no children. This earnings reduction acts as a “child tax”, similar to that found in other countries.

B. Point Estimates of Crisis Impacts

Table 1 reports results for the estimated impact of the food and fuel price 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. Each entry shows the coefficient on a dummy variable for either the first half of 2008 or the first half of 2009 from the probit regression specified in Equation 1, with the first half of 2007 as the reference dummy. 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 bootstrapped standard errors and significance levels that are calculated from the marginal effects of the probit regressions. Finally, results are shown for the decision to engage in any type of employment, wage-employment, self-employment, and unpaid family work.

Tables 1 and 2 indicate that the food and fuel price crisis had a statistically significant negative impact on both men’s and women’s overall employment. For men, the probability of

employment was 0.01 lower during the food and fuel crisis compared to a year earlier, and for women it was 0.02 lower. The larger decline for women is consistent with Figure 1's patterns across educational categories showing that women's overall employment was affected more negatively than that of men during the food and fuel crisis. Tables 1 and 2 further show that virtually all the drop for men during the food and fuel crisis came from wage-employment, while women lost jobs in both wage- and self-employment. Men in the urban sector experienced a slightly larger negative impact on overall employment compared to the rural sector. However, as compared to urban women, rural women saw a larger negative impact on overall employment. This large change for rural women during the food and fuel crisis is coming more from losses in self-employment, while urban women lost the most in terms of wage-employment.

Results for the education categories show that during the food and fuel crisis, men and women with some high school experienced the greatest negative impacts on their overall employment probabilities compared to the other groups. Almost all the education groups experienced a negative employment effect as a result of the food and fuel price crisis, an effect that was statistically significant in eight out of the twelve regressions for overall employment across men and women. Regarding age differences, the negative impacts of this crisis on overall employment were strongest for men below the age of 25 years compared to older men, while women experienced similar declines in their employment probabilities across all age groups. Finally, in terms of wage-employment, declines in the probability of employment tended to be greater for individuals with less education compared to their more educated counterparts. Using education as a proxy for skill, the result suggests that the food and fuel price crisis caused disproportionate losses in wage-employment for unskilled workers compared to skilled workers.

Results in Tables 1 and 2 for the financial crisis indicate that the probability of men's and women's overall employment was still lower during the financial crisis relative to 2007. For both men and women, the probability of employment was 0.01 lower in the financial crisis compared to two years earlier. However, these magnitudes are marginally smaller than the food and fuel crisis effects, suggesting that in aggregate, the negative employment effects that occurred during the food and fuel crisis did not worsen during the financial crisis. As before, virtually all the decline for men came from falling wage-employment, while women lost opportunities in both wage- and self-employment. In contrast to the earlier changes, during the financial crisis, women also saw a small but statistically significant increase in their work as unpaid family workers.

Also during the financial crisis, both men and women in the urban sector experienced a larger negative impact on overall employment compared to the rural sector. Furthermore, urban men and women saw an additional small decline in the likelihood of employment during the financial crisis compared to the food and fuel crisis, while rural sector men and women started to see a rebound by the end of the food and fuel crisis in their overall employment. In terms of the different types of employment, compared to urban women, rural women saw a substantially larger negative impact on their self-employment. However, the size of this coefficient for rural women is smaller during the financial crisis as compared to the food and fuel crisis, again suggesting a small rebound during the food and fuel crisis for rural-sector self-employment. These sector results also show that the financial crisis increase for all women in unpaid family comes entirely from the rural sector.

Table 2's results for the education groups show that men with little to no education and women with low levels of education experienced the greatest negative impacts on their wage-employment probabilities during the financial crisis. Combined with the sectoral decomposition

of employment changes described in Figure 2, one could infer that unskilled men and women in the manufacturing sector had more trouble than individuals in other sectors in keeping their precarious, low-wage jobs 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. Finally, in terms of age, the negative crisis impacts on overall employment were strongest for men below the age of 25 compared to older men, while women experienced similar declines in their employment probabilities across all age groups.

A closer look at the rural versus urban differences for men and women in Figure 4 indicates that both women and men experienced higher unemployment rates in the urban sector throughout the crisis period. While the rural and urban unemployment rates moved roughly in tandem with each other, women in the rural sector saw a sharper decline than their urban counterparts in the second half of 2008 as the food and fuel price crisis eased. Figure 4 also shows some interesting gender differences in labor force participation rates during the crisis period. Between the first and second quarters of 2008 as the food and fuel price crisis was increasing in severity, men's labor force participation increased, mostly in the urban sector, while it dropped noticeably for women in both urban and rural areas. However, by the third quarter of 2008 as the food and fuel crisis came to an end, the labor force participation rate for rural men rose slightly, while it increased substantially for urban and rural women. A similar observation is apparent at the beginning of 2009 during the financial crisis, when the labor force participation rate rose for urban and rural men and women. These increases in labor force participation as the food and fuel price crisis was ending is consistent with the observation made for some other crisis countries of an "added worker" effect," in which individuals, especially

women, join the labor force as they try to compensate for declines in household income caused by crisis-related disruptions (Parker and Skoufias 2004; Jones *et al.* 2009).

Insert Figure 4 Here.

C. Historical Context

In comparing the labor market impacts of the 2008-2009 food, fuel, and financial crisis with impacts of the 1997-1998 Asian financial crisis, we look to the standard unemployment rate by gender, as reported in Figure 5, Panel A. It is striking how the 2008-2009 crisis had a considerably smaller impact compared to the dramatic upswing in unemployment following the Asian financial crisis in the late 1990s. As a caveat, the definition of unemployment was revised in the underlying series in 2005. Hence the pre- and post-2005 unemployment rates in absolute terms are not strictly comparable, and the large drop between 2004 and 2005 is most likely due to the change in the statistical definition of unemployment. Also of note, the gap between men and women in unemployment rates steadily closed over time, and after 2005 the rate for women dropped and remained below the rate for men. This trend could be due to changes in the composition of the workforce for women, such as the exit of low-skilled, low-educated women from the labor market, or qualitative change in the composition of available jobs due to skill-biased technological change (Acemoglu 1999).

Insert Figure 5 Here.

As with unemployment, employment trends also reveal substantial declines following the 1997-1998 Asian crisis but not to the same extent in the more recent crisis. Figure 5, Panel B shows a large drop in the employment-to-population ratio for men, and somewhat for women, after the 1997-1998 Asian crisis, but not to the same extent during the 2008-2009 food, fuel and financial crisis, as indicated by the aggregate data. In addition, while men's employment-to-

population ratios have fallen somewhat since the early 1980s, they have risen for women, especially during the late 1990s. Both men and women experienced a small drop in the employment-population ratio in 2008 and 2009, but these drops were not as pronounced as the earlier crisis. These small drops in the employment-population ratios are also consistent with the labor force participation patterns shown earlier.

As in other developing economies, underemployment has remained a concern in the Philippine labor market during economic crises. Data from the Philippines Labor Force Surveys indicate that the underemployment rate (calculated as the percentage of employed individuals who want or desire additional hours of work) underwent several fluctuations during the food, fuel, and financial crisis. Using the three-month moving average of this measure since that is less volatile than the actual rate itself, estimates indicate that starting from April 2008, the moving average rose from 19 percent to a peak of 20 percent just three months later, before subsiding to its original level in January 2009. This three-month period of increased underemployment subsumes the food and fuel price crisis (March 2008 to August 2008). During the time period that corresponds to the financial crisis (October 2008 to April 2009), the moving average measure of underemployment actually fell (from 19 percent to 18 percent). Hence, the Labor Force Survey data indicates that the underemployment rate was affected differently by the two crises – the food and fuel price hikes increased this rate, whereas the financial crisis that followed had the opposite effect. The differential transmission mechanisms of the two crises could help to explain these opposing trends. Assuming that the primary transmission mechanism of the food and fuel price crisis was prices, while the financial crisis affected the Philippine economy primarily through the large external shock to external demand, one could reasonably argue that individuals felt greater budgetary constraints with the rising prices during the food and

fuel price crisis, and hence desired additional work to keep up with their rising household expenses. Once this price pressure eased in 2009, the desire for additional work subsided. They may also have been unable to find additional work due to the decline in external demand.

IV. Wages

A. Wage Changes During the Crisis

The food and fuel price crisis, back-to-back with the financial crisis, placed intense downward pressure on real wages. Although men's and women's nominal daily wages rose steadily in the 2001-08 period across sectors, it was not enough to keep pace with inflation, and real wages declined fairly steadily for men and women during the 2000s (ILO various years). The price increases associated with the food, fuel, and financial crisis period placed additional downward pressure on real wages. As shown in Figure 6, real wage cuts affected men and women across most education groups during both crises, including those with high school and college educations. In 2008 as the Philippine economy went through the food and fuel price crisis, men with no education, who were likely to be working in the informal sector in urban areas and as agricultural wage-laborers in rural areas, were among the least able to have their nominal wages keep pace with the rising prices.⁷ However, during the financial crisis, real wages for uneducated men had actually increased relative to 2007, indicating a relatively large rebound.

Insert Figure 6 Here.

Uneducated women did not suffer the same wage cuts during the food and fuel crisis, although they did experience very high employment losses, as shown earlier. Both women and men with completed high school educations experienced real wage declines during both crises. Even those with college education experienced either stagnant (men) or falling (women) real wages during both crises. Note also the large wage premium earned by women with college

educations compared to all other women. Although college-educated men also earned a wage premium, the gap between college-educated workers and those without a college degree was much higher for women. If one were to consider more education as a proxy for skilled workers, these results, together with the earlier employment results, are indicative that skilled workers in general were able to maintain employment at the cost of real wage cuts. In contrast, unskilled workers experienced the crisis conditions more through losses in employment.

A similar analysis by sector of production rather than education groups indicates that these real wage cuts hit men and women across sectors during the food and fuel crisis, with continued real wage losses into the financial crisis for some (Figure 7). Only women's service sector jobs were spared the sharp cuts in real wages seen elsewhere in the economy in the first half of 2008, but by the second half of 2008 women's real wages in services had also fallen. For example, relative to 2007, women's real daily wages in manufacturing dropped by 3 percent in 2008 and by 7 percent in 2009; for men these declines amounted to 5 percent and 4 percent, respectively.⁸ In comparing the changes in 2008 and 2009, women in manufacturing saw a worsening in their real daily wages even in 2009, while men's manufacturing sector wages had begun to rebound a little by 2009. Hence the 2009 global slump in consumer demand for manufactured goods and the resulting intense downward pressure on labor costs appears to have hit female workers in the Philippines particularly hard. This industry analysis further shows that both men and women in agriculture also experienced sharp cuts in real wages in 2008 relative to 2007, with a partial rebound for men by 2009. Such a rebound was not observed for other industries, which includes construction. Although the construction sector grew from election and stimulus spending, both men and women still experienced substantial real wage cuts in this sector in both years.

Insert Figure 7 Here.

During the crisis period, the wage gap between men and women fluctuated considerably. As shown by the Oaxaca-Blinder decomposition results in Figure 8, the residual wage gap between men and women shrank during the overall 2007-09 period, from 0.24 to 0.21 log points. However, this overall change masks substantial movements during the period. In particular, the gap increased in the second half of 2008, although there was some improvement thereafter. The latter half of 2008 marked a period of continued high prices in the Philippines, and U.S. financial markets were in turmoil. 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 lower workplace status are less able to negotiate for favorable working conditions and higher pay.

Insert Figure 8 Here.

B. Point Estimates of Crisis Impacts

Table 3 reports the results of the food, fuel, and financial crisis on men's and women's real wages. Nominal wages are deflated to real values using quarterly regional CPI measures from the Philippines National Statistics Office. Each entry in the table shows the coefficient (from a series of OLS wage regressions) on a dummy variable for either the first half of 2008 (column labeled "food, fuel crisis") or the first half of 2009 (column labeled "financial crisis"), with the first half of 2007 as the reference dummy. Standard errors reported in Table 3 are bootstrapped.

Discussing the impacts of the food and fuel price crisis first, estimates in Table 3 show that real wages fell for both men and women across sectors, education groups, and age groups.

Men's overall real wages dropped by 3 percent during the food and fuel crisis relative to a year earlier, while women's overall real wages dropped 2 percent. The sector results for wages indicate that men and women in the urban sector experienced substantially larger wage declines compared to their rural counterparts. Among education groups, men and women with high school and college degrees experienced the greatest wage impacts, with approximately 3 to 4 percent declines for both of these groups. While men in most other education groups experienced wage cuts of approximately 2 to 3 percent during the food and fuel crisis, women in the lower education groups experienced virtually no wage effects. Finally, older men and women saw larger real wage cuts as a result of the food and fuel price crisis compared to the youngest cohort. In conjunction with the employment results, older workers appear to have maintained their jobs at the expense of lower real wages. These wage results reinforce the general conclusion that while the food and fuel price crisis impacted uneducated individuals mainly in terms of decreases in employment, those with more education were affected primarily in terms of real wage declines. Note that some part of the real wage effects may reflect trend declines in real wages. Real wages declined fairly steadily during the 2001-08 period, as indicated by annual data published by the ILO (ILO various years).⁹ To disentangle how much of the real wage decline is due to the crisis and how much is due to the trend decline, we would need to include annual trends in the regression model. However, since our repeated cross sections of LFS data cover only the period 2007 through mid-2009, we have insufficient data to generate an accurate trend.

Table 3 further indicates the continuation of 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 larger than those of the food and fuel crisis, implying that

most, if not all, of the real wage decline occurred during the food and fuel crisis. The sector results for wages show that men in the urban sector and women in the rural sector experienced larger wage declines compared to their counterparts. That said, men and women across sectors, and especially in the rural sector, continued to experience a downward spiral in their real wages during the financial crisis. Among education groups, women with high school degrees experienced the greatest wage impacts, whereas the largest impacts for men were distributed between more and less educated groups. These impacts range in magnitude between 4 to 5 percent for men, and approximately 5 percent for women with high school degrees.

Similar to the impacts during the food and fuel crisis, women in the lower education groups 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 price crisis, the financial crisis affected real wages of those with less education (some elementary through some high school) and those with more education (completed high school through collage and above) relatively equally. Finally, older workers had more dramatic real wage cuts during the financial crisis compared to their younger counterparts, and the growing severity of wage cuts for older age groups occurred 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. Hence the interpretation of the results is specific to a particular quantile, and with respect to other data points within that quantile. For example, the 0.02 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 0.06 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.

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 6 percent drop in real wages during the food and fuel crisis and a drop of 8 percent during the financial crisis, compared to a 2 percent drop for men in the 10th percentile during the food and fuel crisis and a 3 percent drop during the financial crisis. This discrepancy between high- and low-earning men in the wage impacts occurred in both the urban sector and the rural sector. Women also saw greater wage impacts at the upper end of the wage distribution, although for women, more of this discrepancy between high- and low-earners appears to have occurred in the urban sector as compared to the rural sector. Interestingly, larger 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 continued to experience real wage declines during the financial crisis.

V. Conclusion

This study has analyzed the gender-disaggregated employment and wage impacts of the 2008-2009 food, fuel, and financial crisis in the Philippine labor market. An in-depth exploration based on descriptive statistics and probit regressions indicates substantial employment declines, especially during the food and fuel crisis for individuals with less education. The probability of overall employment fell for men by about 0.01 during the food and fuel crisis relative to 2007

and remained at this lower probability during the financial crisis. Women saw a slightly larger drop in the likelihood of overall employment during the food and fuel crisis, at 0.02, relative to 2007, with virtually no improvement during the financial crisis. Most of the decline for men came from falling wage-employment, while women lost opportunities in both wage- and self-employment. Results also indicate that the crisis has led to substantial job losses in labor- and capital-intensive manufacturing for both men and women. These losses in manufacturing are largely explained by the primary transmission mechanism of the financial crisis: the decline in world demand for many types of goods from developing countries such as the Philippines, whose primary export earnings came from electronic products and other manufactured commodities before the crisis.

Furthermore, the notion that women's unpaid domestic work responsibilities grow during crisis periods is supported with this study's findings: between 2007 and 2009, increases in employment as unpaid family workers were biased toward women at the same time that women lost remunerative jobs as self-employed workers, wage workers, and employers. The increase in women's unpaid work served as a coping mechanism for the main transmission mechanisms of the food and fuel price crisis (higher domestic prices) as well as the financial crisis (reduction in external demand). Reductions in self-employment opportunities for women is consistent with the idea that economic crises lead to reduced demand for the small-scale products and services that women produce and sell. Overall though, the employment impacts of the food, fuel, and financial crisis have proven to be less severe in the Philippines compared to the impacts of 1997-1998 Asian crisis.

Real wages fell sharply as a consequence of both the food and fuel price crisis and the financial crisis. During the food and fuel price crisis, men's overall real wages dropped by 3

percent and women's overall real wages dropped by 2 percent, with some additional decline for both men and women during the financial crisis. 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. For example, men in the 95th percentile of the male wage distribution in the national sample experienced a 6 percent drop in real wages during the food and fuel crisis and a drop of 8 percent during the financial crisis relative to 2007, compared to a 2 to 3 percent drop for men in the 10th percentile in these years. A similar discrepancy in the crisis impacts between the upper and lower tails of the wage distribution was also found for women, and this discrepancy was evident across both the rural and urban sectors.

In considering education as a proxy for skill, the results suggest that unskilled workers suffered relatively more in terms of losses in wage employment, whereas skilled workers experienced relatively greater declines in their real daily wages. This conclusion holds especially for women, and especially for the impacts of the food and fuel price crisis, given that men tended to see more of a stabilizing effect during the financial crisis as compared to women. One possible explanation for these trends is that in the face of downward pressure on wages and fewer paid-job opportunities, unskilled workers had little choice but to exit the labor market and to take up work as unpaid family workers. Skilled workers continued to participate in the labor market although at lower real wages.

Other possible explanations could hinge on the types of occupations in which skilled and unskilled workers were engaged. 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, leading to the labor market exit of workers who were formerly engaged in such occupations. In support of this

argument, the paper's descriptive evidence showed that relative to 2007, in aggregate, women lost jobs in agriculture and both women and men lost jobs in manufacturing during the food and fuel crisis. There was some improvement in terms of employment for women in agriculture during the financial crisis, but workers in manufacturing continued to experience substantial employment losses. On the other hand, jobs that required skill and experience were less vulnerable to economic shocks, although employers may have adjusted to difficult circumstances by postponing nominal wage increases. In a scenario of price increases as was the case with this 2008-2009 crisis period, the skill-story would manifest itself as a fall in real wages for more educated workers in the upper tails of the wage distribution.

The gender-disaggregated trends in employment and real wages varied across urban and rural areas of the Philippines. In terms of employment impacts of the food and fuel price crisis, men in urban areas and women in rural areas experienced a larger negative impact compared to their respective counterparts. During the financial crisis, though, men and women in urban areas were more negatively affected as compared to rural areas. Some of these changes could be explained by differences between urban and rural areas in the location of manufacturing and other industries. As shown in our descriptive analysis, during the financial crisis, employment for both men and women in manufacturing continued to decline, while employment in agriculture for both men and women improved. Since agricultural jobs tend to be concentrated in rural areas, such differences in the sector of production may explain why employment effects during the financial crisis were more negative in urban as compared to rural areas. Results further indicated that the real wage declines during the food and fuel crisis were larger in urban than rural areas for both men and women, and both urban and rural sector workers saw a further deterioration in real wages during the financial crisis. Finally, although both men and women in the upper tails of

the real wage distribution experienced the strongest declines in terms of real earnings power, the declines in urban areas were generally larger than in rural areas.

This research has also provided evidence that the employment and wage impacts of the food and fuel price crisis differed from those of the financial crisis. In particular, in response to the food and fuel crisis, less educated (unskilled) workers suffered employment losses whereas more educated (skilled) workers maintained their jobs but experienced declines in real wage. However, the financial crisis had the largest negative effects in terms of employment on the more educated workers. Furthermore, the financial crisis seems to have had real wage effects across most education sub-categories for men (although, like the food and fuel crisis, it continued to affect only more educated women). Thus the employment and real wage story for unskilled versus skilled is less clear-cut during the financial crisis. The differential responses in employment and wages during both crises is consistent with a story where the more vulnerable (less educated) are adversely affected first when a crisis begins, but as the crisis continues over time, the less vulnerable (more educated) are negatively impacted as well.

In terms of policy options, the Philippine government was quick to react to the crisis conditions soon after they appeared. In response to the adverse consequences of the global financial crisis, 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 in which workers take leave on other days, and forced leaves (Son and San Andres 2009). Participation in such flexible work arrangements was purely voluntary, and it was broadly recognized that such policies could help reduce business costs while reducing terminations and

maintaining competitiveness in the industrial sector. The skill level of all displaced workers was also compiled to help with formulating and planning responses in the future. 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 sector 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 indicate 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 is that employed workers will eventually have to search for other jobs when CLEEP ends as there are no plans instituted to situate workers into other private or public positions.

In summary, the government's response to the crisis in terms of the provision of temporary jobs and assistance to the poor succeeded in cushioning the adverse effects for those who had been especially hard-hit. It is likely that the employment effects estimated in this study would have been larger in the absence of Government provided stimuli. However, given data constraints, we were unable to separate out the impact of the stimulus package from the estimated employment and wage effects.

In terms of policy implications for the future, this study points to the need to determine which sectors will be the engines of growth in the long-run, and to redirect funds from the fiscal

stimulus towards these areas in order to lay the foundations for sustained economic growth. Key areas include health and education services, worker retraining, and the provision of incentives for firms to move in appropriate directions in terms of hiring and choice of activity (Son and San Andres, 2009). Since women's access to health, education, and vocational training programs is unlikely to be on par with men's access, policy reforms will need to address such gender disparities in access in order to ensure long-run equity.

One reason for why women may have more limited access to palliative programs is the fact that during periods of economic crisis, their total hours of work (paid and/or unpaid) increases. Lessons from the 1997-98 East Asian crisis showed that one of the labor market consequences was an exacerbation in the difference between the total number of hours worked by men and women, with the crisis resulting in "overworked" women and "underworked" men (Lim, 2000). Our results for the food, fuel, and financial crisis underscore a similar conclusion. If women are unable to attend remedial programs because of increased work burdens, one solution that might work well is to change the time at which the programs are held in order to facilitate greater attendance.

Moreover, women's ability to take advantage of other ameliorative policies may be limited by the type and specialization of labor required. For example, Yap *et al.* (2009) argue for increased private rural sector investment in the wake of the global financial and economic crisis in order to generate additional employment opportunities in the countryside where labor is underemployed and of low productivity. One of the recommendations is increased investment in rural road and rural electrification projects that will bring direct benefits to the farm sector and indirect benefits to the non-farm sector. Although investment in such infrastructure is critical, it is unlikely that women would benefit from the employment opportunities generated from such

projects because such employment tends to be hard physical labor where employers would prefer to hire male over female workers. A policy prescription that might generate work for women more effectively would be the implementation of assistance programs (such as subsidized loans and aid in marketing products) for generating employment in cottage and other small-scale industries to which women's labor is particularly suited.

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. Women may already be working more hours as a consequence of the crisis, and programs such as WEED can facilitate movement from unpaid work to work that is more remunerative. As is well established, increased income in the hands of women has beneficial impacts on children's nutrition, schooling, and other indicators of household welfare (Haddad *et al.* 1997, World Bank 2001). Hence, such programs are likely to have lasting salubrious consequences for future generations as well.

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Table 1. Marginal Effects for the Food and Fuel Price Crisis and the Financial Crisis Impacts on Male Employment

	All Employment		Wage Employment		Self-Employment		Family Workers	
	<i>Food, Fuel Crisis</i>	<i>Financial Crisis</i>						
<i>All country</i>	-0.012 ^{***} (0.002)	-0.011 ^{***} (0.002)	-0.010 ^{***} (0.002)	-0.013 ^{***} (0.002)	-0.002 (0.001)	0.0002 (0.002)	-0.001 (0.001)	-0.0003 (0.001)
<i>Sector</i>								
Urban	-0.013 ^{***} (0.003)	-0.015 ^{***} (0.003)	-0.011 ^{***} (0.003)	-0.011 ^{***} (0.003)	-0.001 (0.002)	-0.001 (0.002)	-0.001 [*] (0.001)	-0.002 ^{***} (0.001)
Rural	-0.010 ^{***} (0.002)	-0.008 ^{***} (0.002)	-0.009 ^{***} (0.003)	-0.014 ^{***} (0.003)	-0.002 (0.003)	0.002 (0.003)	-0.0002 (0.001)	0.002 (0.002)
<i>Education</i>								
None	-0.017 (0.014)	-0.014 (0.012)	-0.027 ^{**} (0.011)	-0.023 ^{**} (0.010)	0.006 (0.018)	0.004 (0.017)	0.008 (0.006)	0.005 (0.007)
Some elementary	-0.003 (0.003)	0.004 (0.003)	-0.015 ^{***} (0.005)	-0.017 ^{***} (0.005)	0.010 [*] (0.006)	0.017 ^{***} (0.006)	0.002 (0.002)	0.003 (0.002)
Completed elementary	0.003 (0.003)	0.006 [*] (0.004)	-0.001 (0.006)	0.002 (0.006)	0.001 (0.005)	0.002 (0.005)	0.002 (0.002)	0.001 (0.002)
Some high school	-0.022 ^{***} (0.005)	-0.017 ^{***} (0.006)	-0.014 ^{***} (0.005)	-0.012 ^{**} (0.005)	0.0002 (0.004)	-0.001 (0.003)	-0.005 ^{**} (0.002)	-0.003 (0.002)
Completed high school	-0.009 ^{***} (0.004)	-0.013 ^{***} (0.004)	-0.005 (0.004)	-0.013 ^{***} (0.004)	-0.004 (0.003)	-0.003 (0.004)	0.0001 (0.002)	0.002 (0.002)
College and above	-0.019 ^{***} (0.005)	-0.022 ^{***} (0.005)	-0.007 (0.004)	-0.011 ^{***} (0.004)	-0.007 ^{***} (0.003)	-0.004 [*] (0.002)	-0.002 [*] (0.001)	-0.003 ^{***} (0.001)
<i>Age</i>								
15-24	-0.023 ^{***} (0.003)	-0.021 ^{***} (0.004)	-0.010 ^{***} (0.003)	-0.012 ^{***} (0.003)	-0.004 ^{***} (0.002)	-0.005 ^{***} (0.002)	-0.007 ^{***} (0.002)	-0.002 (0.002)
25-39	-0.003 (0.002)	-0.007 ^{***} (0.002)	-0.006 (0.004)	-0.013 ^{***} (0.004)	-0.001 (0.003)	0.001 (0.003)	0.002 (0.001)	0.003 ^{**} (0.001)
40-65	-0.005 ^{**} (0.002)	-0.0004 (0.002)	-0.009 ^{***} (0.004)	-0.007 [*] (0.004)	0.002 (0.003)	0.008 ^{**} (0.004)	0.001 (0.001)	-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 a dummy variable for the 1st half of 2008 or the 1st half of 2009, with the 1st half of 2007 as the reference dummy. This dummy variable sequence implies that the Financial Crisis results represent cumulative effects. Regressions include controls for sector, education, and age. Observations for “all country” male employment are 623,276.

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

Table 2. Marginal Effects for the 2008 Food and Fuel Price Crisis and 2009 Financial Crisis Impacts on Female Employment

	All Employment		Wage Employment		Self-Employment		Family Workers	
	<i>Food, Fuel Crisis</i>	<i>Financial Crisis</i>	<i>Food, Fuel Crisis</i>	<i>Financial Crisis</i>	<i>Food, Fuel Crisis</i>	<i>Financial Crisis</i>	<i>Food, Fuel Crisis</i>	<i>Financial Crisis</i>
<i>All country</i>	-0.019 ^{***} (0.002)	-0.014 ^{***} (0.002)	-0.009 ^{***} (0.002)	-0.010 ^{***} (0.002)	-0.007 ^{***} (0.001)	-0.007 ^{***} (0.001)	-0.002 (0.001)	0.003 ^{***} (0.001)
<i>Sector</i>								
Urban	-0.016 ^{***} (0.003)	-0.017 ^{***} (0.003)	-0.010 ^{***} (0.002)	-0.011 ^{***} (0.002)	-0.003 ^{**} (0.001)	-0.004 ^{***} (0.001)	-0.002 ^{**} (0.001)	-0.001 (0.001)
Rural	-0.023 ^{***} (0.003)	-0.010 ^{***} (0.003)	-0.009 ^{***} (0.002)	-0.008 ^{***} (0.002)	-0.012 ^{***} (0.002)	-0.010 ^{***} (0.002)	-0.001 (0.002)	0.008 ^{***} (0.002)
<i>Education</i>								
None	-0.016 (0.014)	0.028 [*] (0.015)	-0.007 (0.006)	-0.003 (0.007)	-0.015 (0.010)	-0.013 (0.010)	0.009 (0.011)	0.044 ^{***} (0.011)
Some elementary	-0.024 ^{***} (0.006)	-0.002 (0.006)	-0.012 ^{***} (0.005)	-0.013 ^{***} (0.005)	-0.013 ^{***} (0.004)	-0.011 ^{**} (0.005)	0.003 (0.004)	0.022 ^{***} (0.005)
Completed elementary	-0.011 [*] (0.006)	-0.005 (0.006)	-0.011 ^{***} (0.004)	-0.011 ^{**} (0.004)	-0.006 (0.004)	-0.008 [*] (0.004)	0.007 ^{**} (0.003)	0.014 ^{***} (0.003)
Some high school	-0.027 ^{***} (0.005)	-0.013 ^{**} (0.005)	-0.010 ^{***} (0.004)	-0.003 (0.003)	-0.006 ^{***} (0.002)	-0.007 ^{***} (0.002)	-0.005 ^{**} (0.002)	0.001 (0.002)
Completed high school	-0.023 ^{***} (0.004)	-0.024 ^{***} (0.004)	-0.010 ^{***} (0.003)	-0.013 ^{***} (0.003)	-0.007 ^{***} (0.002)	-0.007 ^{***} (0.002)	-0.003 [*] (0.002)	-0.002 (0.002)
College and above	-0.012 ^{***} (0.004)	-0.013 ^{***} (0.004)	-0.002 (0.004)	-0.005 (0.004)	-0.005 ^{***} (0.002)	-0.004 ^{**} (0.002)	-0.003 ^{**} (0.001)	-0.002 (0.001)
<i>Age</i>								
15-24	-0.017 ^{***} (0.003)	-0.013 ^{***} (0.004)	-0.009 ^{***} (0.003)	-0.010 ^{***} (0.003)	-0.001 (0.001)	-0.001 (0.001)	-0.005 ^{***} (0.001)	-0.001 (0.001)
25-39	-0.019 ^{***} (0.004)	-0.014 ^{***} (0.004)	-0.007 [*] (0.004)	-0.007 ^{**} (0.003)	-0.012 ^{***} (0.003)	-0.010 ^{***} (0.002)	-0.0004 (0.002)	0.002 (0.002)
40-65	-0.017 ^{***} (0.003)	-0.010 ^{***} (0.003)	-0.010 ^{***} (0.003)	-0.009 ^{***} (0.003)	-0.010 ^{***} (0.002)	-0.011 ^{***} (0.002)	0.002 (0.002)	0.009 ^{***} (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 a dummy variable for the 1st half of 2008 or the 1st half of 2009, with the 1st half of 2007 as the reference dummy. This dummy variable sequence implies that the Financial Crisis results represent cumulative effects. Regressions include controls for sector, education, and age. Observations for “all country” female employment are 605,587.

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

Table 3. OLS Regression Estimates of the 2008 Food and Fuel Price Crisis and 2009 Financial Crisis Impacts on Real Daily Wages

	Male Wages		Female Wages	
	<i>Food, Fuel Crisis</i>	<i>Financial Crisis</i>	<i>Food, Fuel Crisis</i>	<i>Financial Crisis</i>
<i>All country</i>	-0.034 ^{***} (0.004)	-0.044 ^{***} (0.004)	-0.018 ^{***} (0.005)	-0.032 ^{***} (0.005)
<i>Sector</i>				
Urban	-0.040 ^{***} (0.005)	-0.046 ^{***} (0.005)	-0.022 ^{***} (0.006)	-0.028 ^{***} (0.006)
Rural	-0.026 ^{***} (0.005)	-0.040 ^{***} (0.006)	-0.009 (0.009)	-0.037 ^{***} (0.009)
<i>Education</i>				
None	-0.022 (0.033)	-0.062 (0.039)	0.027 (0.069)	0.084 (0.055)
Some elementary	-0.029 ^{***} (0.009)	-0.047 ^{***} (0.009)	0.034 ^{**} (0.015)	-0.003 (0.017)
Completed elementary	-0.032 ^{***} (0.009)	-0.040 ^{***} (0.008)	0.023 (0.014)	-0.007 (0.014)
Some high school	-0.019 ^{**} (0.008)	-0.038 ^{***} (0.009)	-0.001 (0.016)	-0.023 (0.016)
Completed high school	-0.040 ^{***} (0.006)	-0.048 ^{***} (0.006)	-0.034 ^{***} (0.010)	-0.053 ^{***} (0.010)
College and above	-0.037 ^{***} (0.007)	-0.041 ^{***} (0.007)	-0.025 ^{***} (0.008)	-0.029 ^{***} (0.009)
<i>Age</i>				
15-24	-0.014 ^{**} (0.007)	-0.027 ^{***} (0.008)	0.007 (0.009)	-0.020 ^{**} (0.009)
25-39	-0.037 ^{***} (0.005)	-0.041 ^{***} (0.005)	-0.031 ^{***} (0.008)	-0.030 ^{***} (0.008)
40-65	-0.045 ^{***} (0.007)	-0.059 ^{***} (0.008)	-0.017 [*] (0.010)	-0.038 ^{***} (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 coefficient on a dummy variable for the 1st half of 2008 or the 1st half of 2009, with the 1st half of 2007 as the reference dummy. This dummy variable sequence implies that the Financial Crisis results represent cumulative effects. Regressions include controls for sector, education, and age. Observations total 197,171 for male wages and 127,602 for female wages.

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

Table 4. Quantile Regression Estimates of the 2008 Food and Fuel Price Crisis and 2009 Financial Crisis Impacts on Real Daily Wages

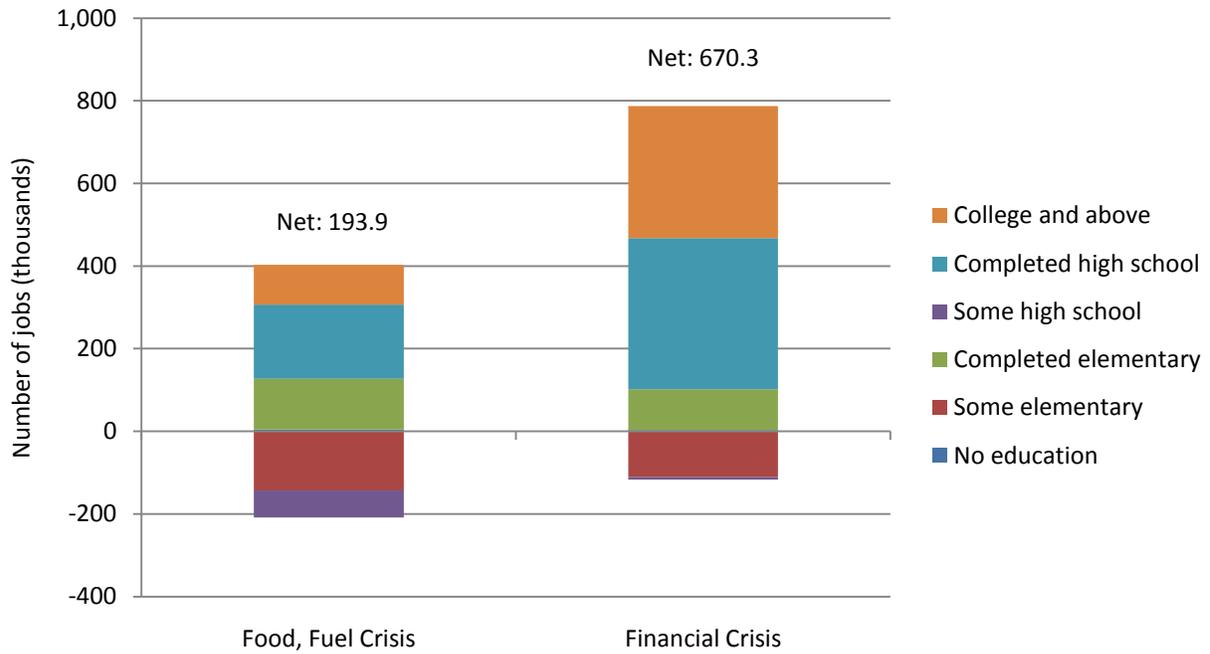
Wage Percentile	Total		Urban		Rural	
	<i>Food, Fuel Crisis</i>	<i>Financial Crisis</i>	<i>Food, Fuel Crisis</i>	<i>Financial Crisis</i>	<i>Food, Fuel Crisis</i>	<i>Financial Crisis</i>
<i>Male</i>						
10	-0.022 ^{***} (0.007)	-0.027 ^{***} (0.007)	-0.029 ^{**} (0.017)	-0.031 ^{***} (0.010)	-0.019 [*] (0.011)	-0.026 ^{***} (0.010)
30	-0.023 ^{***} (0.005)	-0.027 ^{***} (0.004)	-0.013 ^{**} (0.006)	-0.013 ^{**} (0.005)	-0.027 ^{***} (0.007)	-0.036 ^{***} (0.008)
50	-0.028 ^{***} (0.003)	-0.046 ^{***} (0.003)	-0.026 ^{***} (0.006)	-0.032 ^{***} (0.006)	-0.027 ^{***} (0.007)	-0.053 ^{***} (0.008)
70	-0.038 ^{***} (0.003)	-0.044 ^{***} (0.004)	-0.037 ^{***} (0.004)	-0.043 ^{***} (0.005)	-0.027 ^{***} (0.007)	-0.044 ^{***} (0.006)
90	-0.046 ^{***} (0.005)	-0.062 ^{***} (0.004)	-0.058 ^{***} (0.006)	-0.068 ^{***} (0.007)	-0.029 ^{***} (0.010)	-0.059 ^{***} (0.009)
95	-0.063 ^{***} (0.006)	-0.080 ^{***} (0.007)	-0.075 ^{***} (0.008)	-0.082 ^{***} (0.008)	-0.048 ^{***} (0.008)	-0.081 ^{***} (0.011)
<i>Female</i>						
10	0.016 [*] (0.010)	-0.001 (0.008)	-0.006 (0.012)	-0.013 (0.015)	0.013 (0.020)	0.006 (0.018)
30	-0.015 ^{***} (0.006)	-0.017 ^{***} (0.005)	-0.019 ^{**} (0.008)	-0.004 (0.005)	-0.022 ^{**} (0.009)	-0.045 ^{***} (0.012)
50	-0.025 ^{***} (0.005)	-0.044 ^{***} (0.007)	-0.025 ^{***} (0.009)	-0.031 ^{***} (0.009)	-0.024 ^{***} (0.008)	-0.055 ^{***} (0.009)
70	-0.029 ^{***} (0.006)	-0.045 ^{***} (0.006)	-0.041 ^{***} (0.010)	-0.045 ^{***} (0.009)	-0.014 [*] (0.008)	-0.044 ^{***} (0.010)
90	-0.034 ^{***} (0.006)	-0.055 ^{***} (0.006)	-0.048 ^{***} (0.007)	-0.053 ^{***} (0.007)	-0.024 ^{**} (0.010)	-0.057 ^{***} (0.011)
95	-0.034 ^{***} (0.008)	-0.053 ^{***} (0.009)	-0.051 ^{***} (0.009)	-0.048 ^{***} (0.011)	-0.007 (0.013)	-0.051 ^{***} (0.013)

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 coefficient on a dummy variable for the 1st half of 2008 or the 1st half of 2009, with the 1st half of 2007 as the reference dummy. This dummy variable sequence implies that the Financial Crisis results represent cumulative effects. Regressions include controls for sector, education, and age. Observations are 197,171 for total men, 127,602 for total women, 109,279 for urban men, 87,892 for rural men, 79,219 for urban women, and 48,383 for rural women.

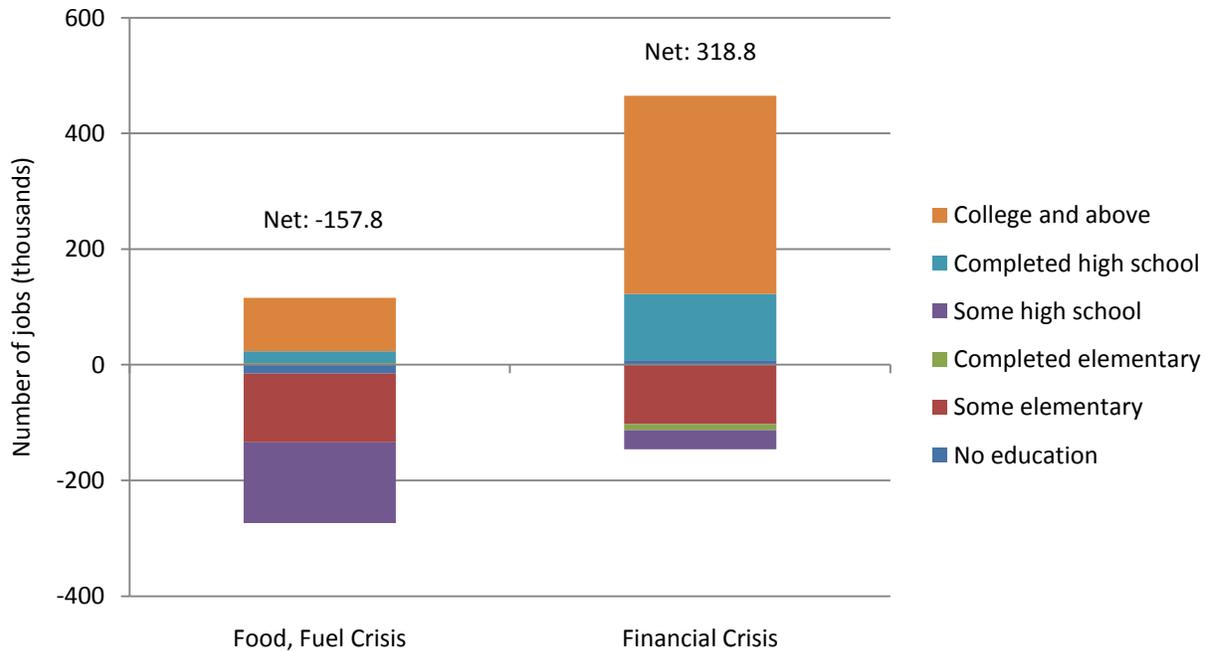
Source: Authors' calculations based on NSO (various years).

Figure 1. Employment Changes by Gender and Education Groups, 2007-2009

Panel A: Men



Panel B: Women

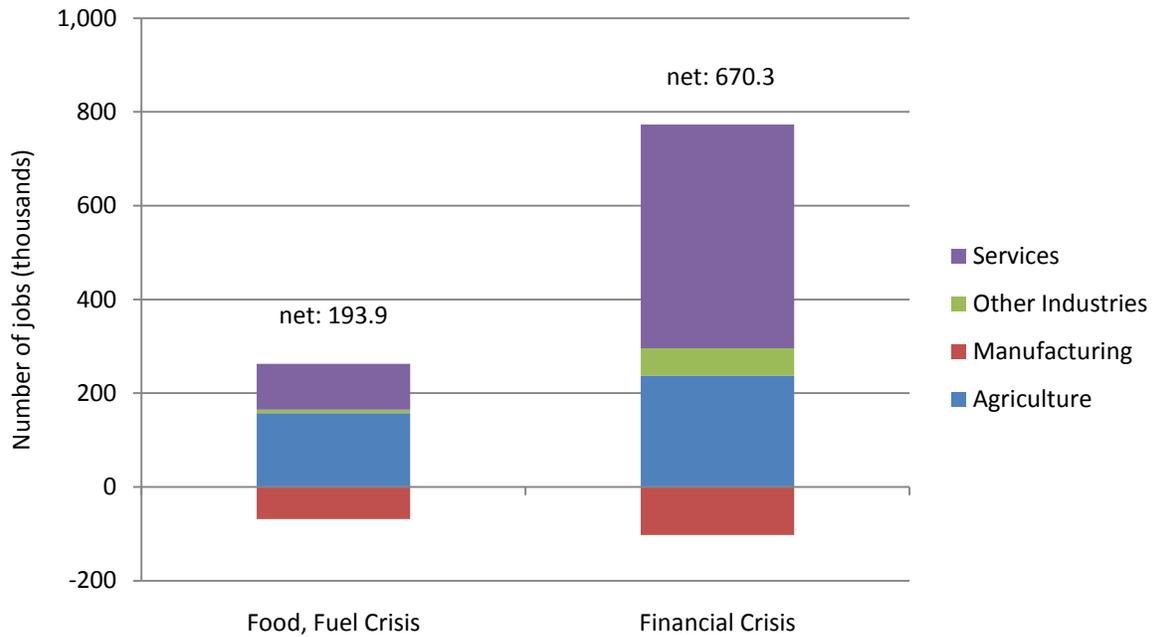


Note: Data represent differences in the number employed between 2007 and 2008 (Food, Fuel Crisis) and 2007 and 2009 (Financial Crisis), using the first semester as the reference point.

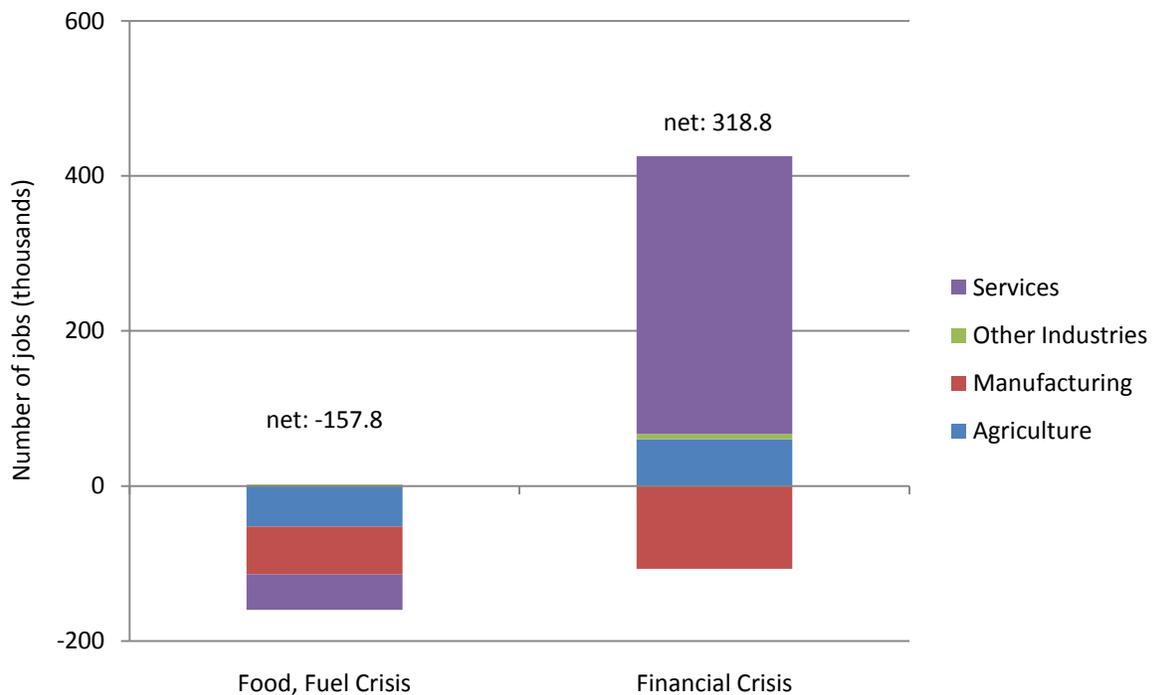
Source: Authors' calculations based on NSO (various years).

Figure 2. Employment Changes by Gender and Sector of Production, 2007-2009

Panel A: Men



Panel B: Women

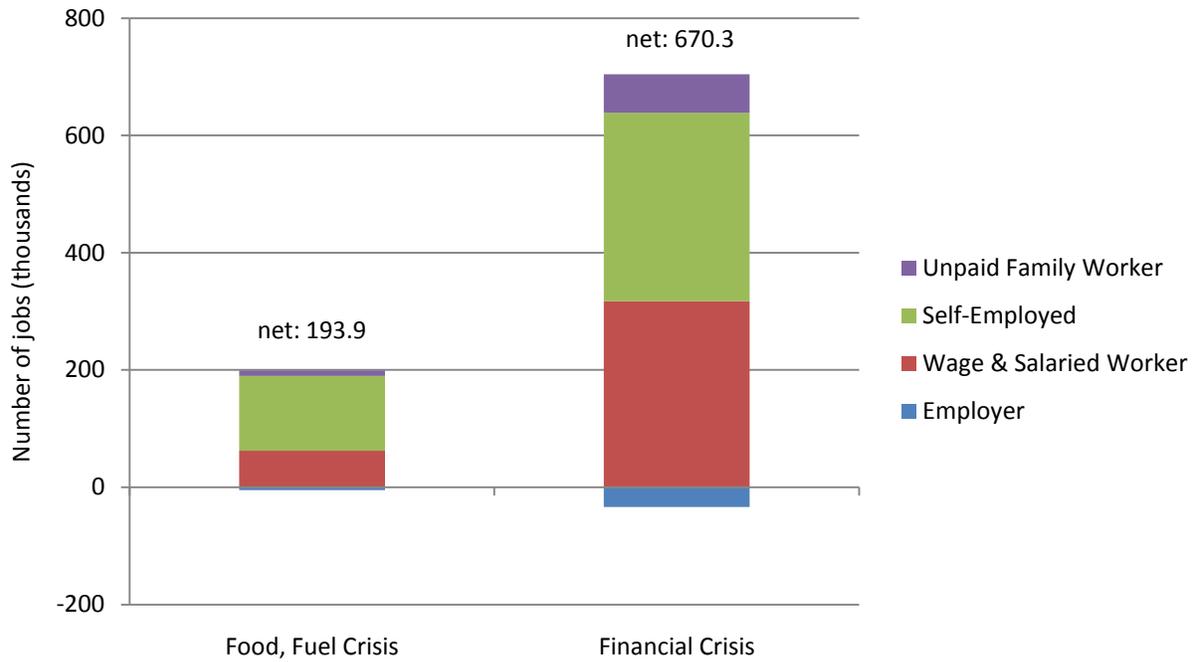


Note: Data represent differences in the number employed between 2007 and 2008 (Food, Fuel Crisis) and 2007 and 2009 (Financial Crisis), using the first semester as the reference point.

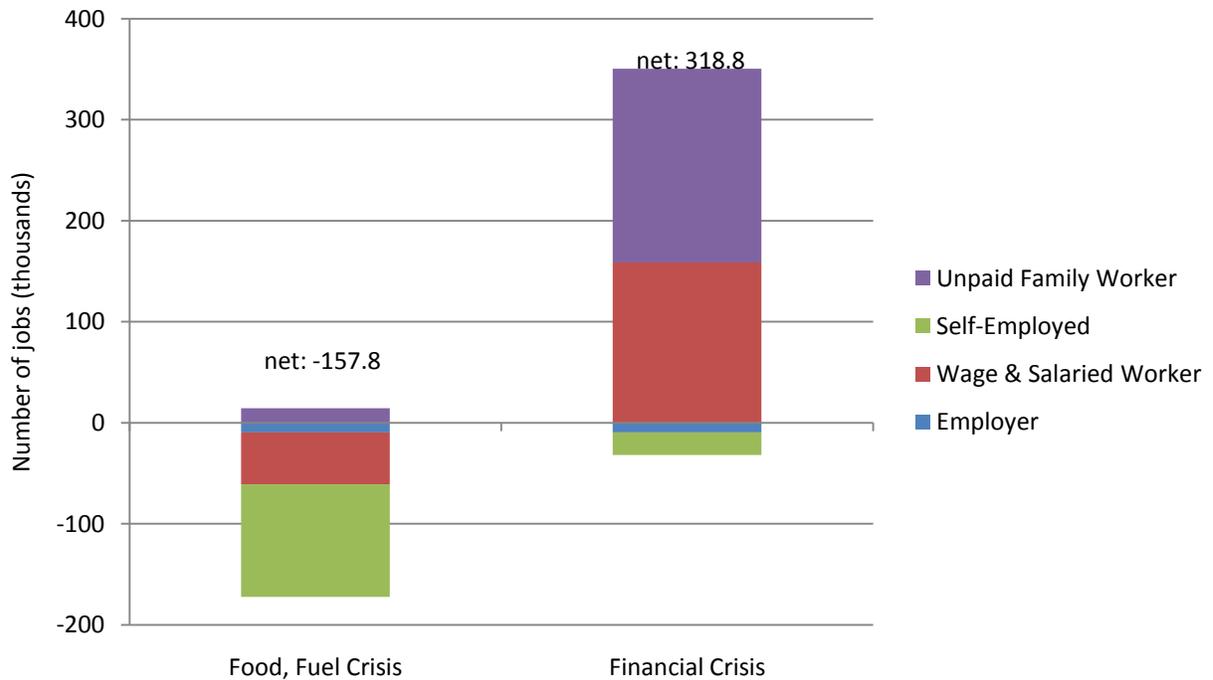
Source: Authors' calculations based on NSO (various years).

Figure 3. Employment Changes by Worker Status, 2007-2009

Panel A: Men



Panel B: Women

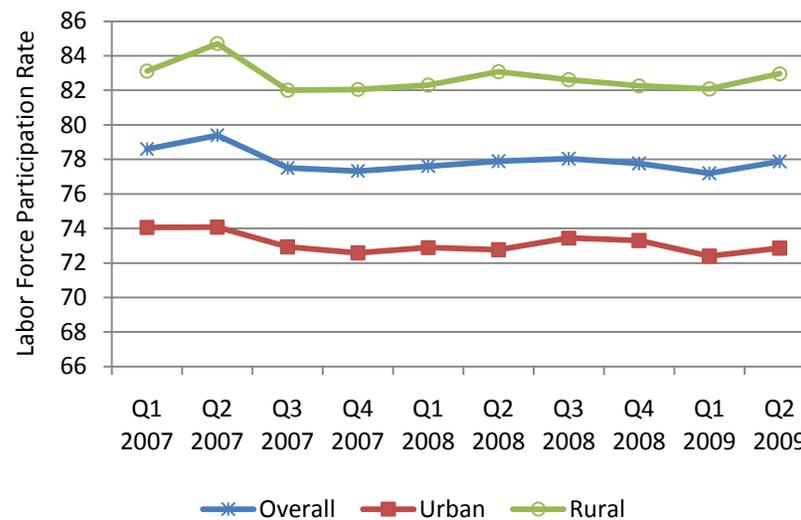
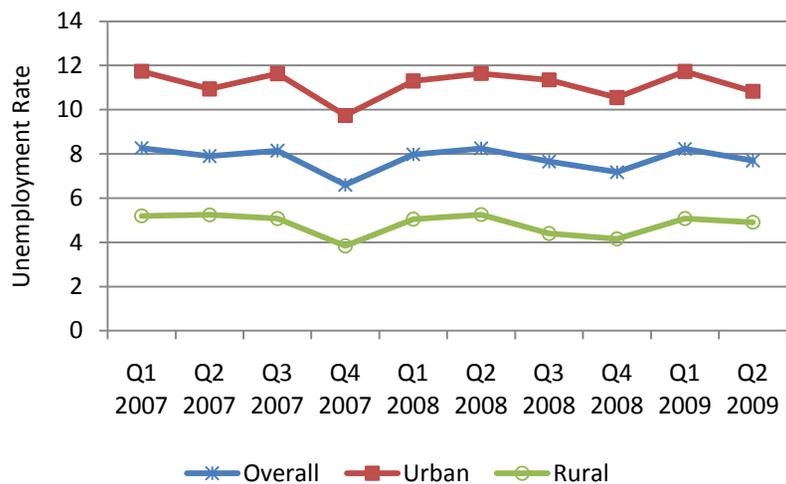


Note: Note: Data represent differences in the number employed between 2007 and 2008 (Food, Fuel Crisis) and 2007 and 2009 (Financial Crisis), using the first semester as the reference point.

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

Figure 4. Changes in Labor Force Participation and Unemployment by Gender and Sector, 2007-2009.

Panel A. Men



Panel B. Women

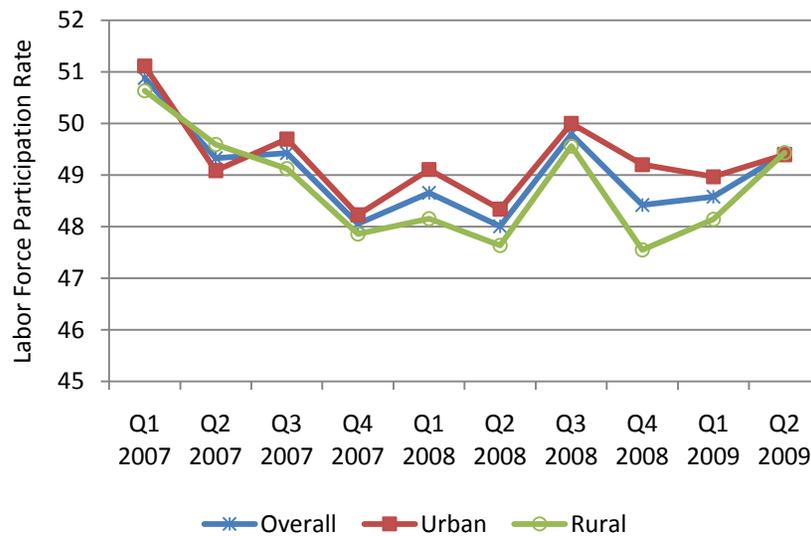
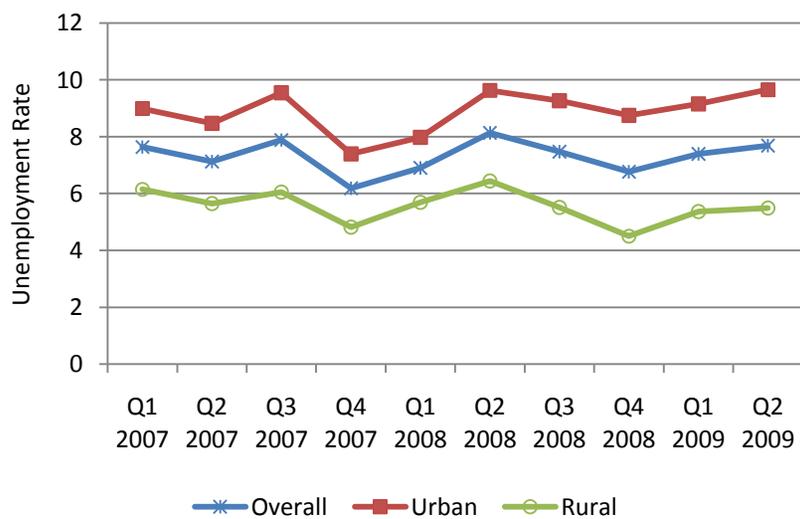
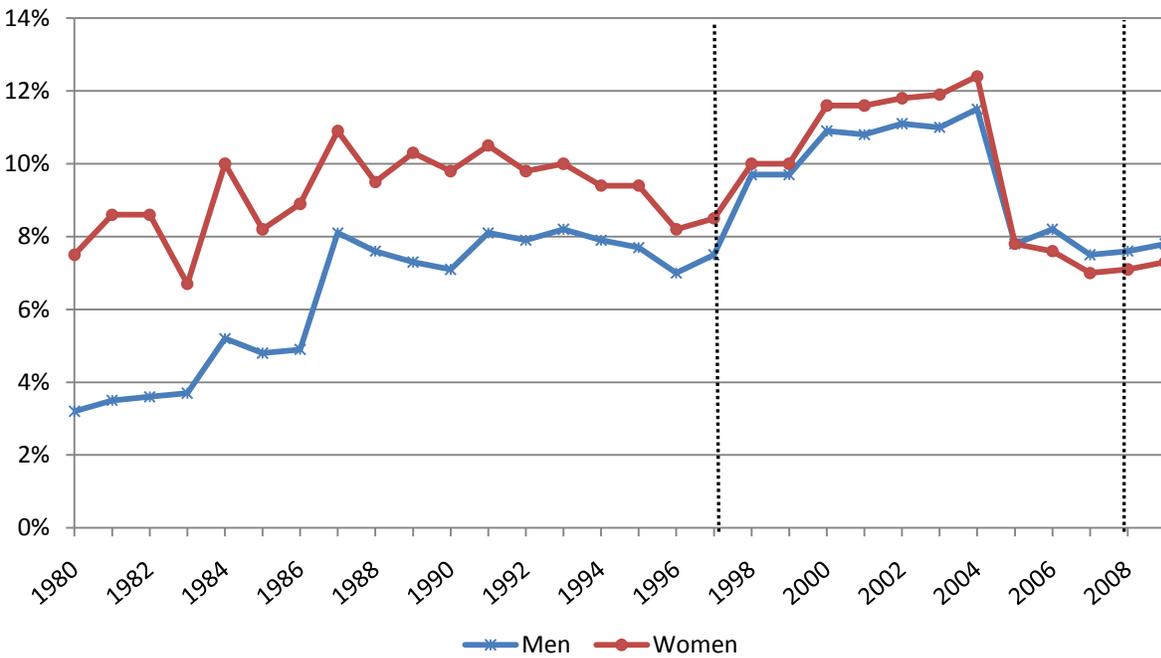
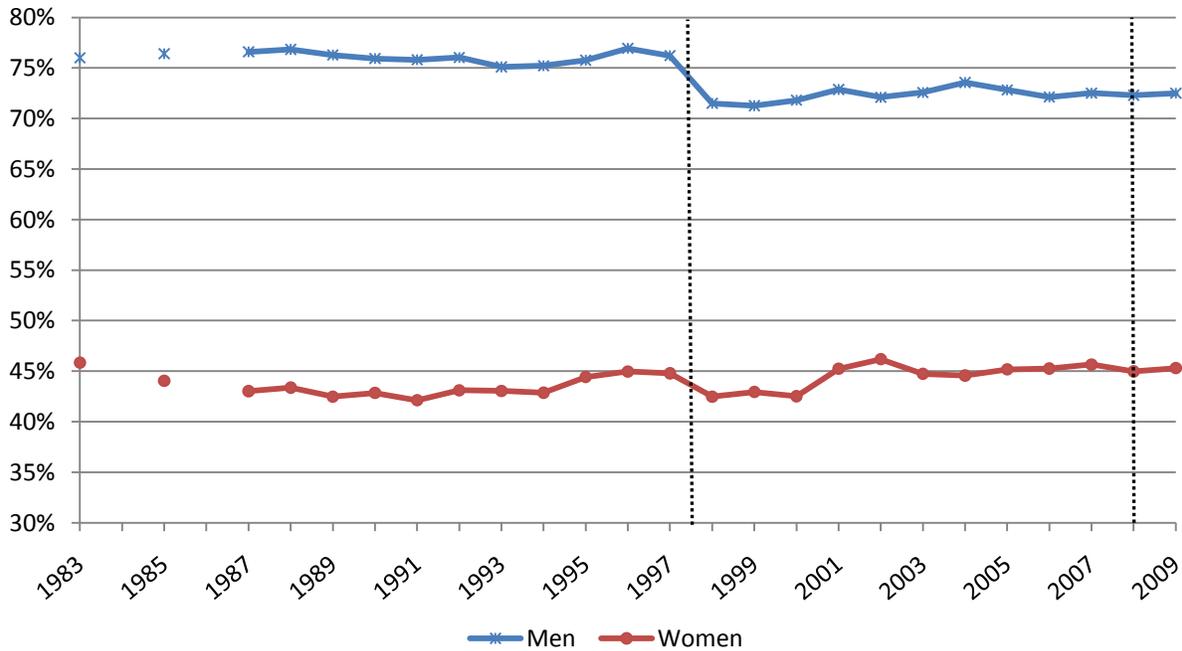


Figure 5. Historical Trends in Unemployment and Employment by Gender, 1980-2009

Panel A. Standard Unemployment Rate



Panel B. Employment-to-Population Ratios

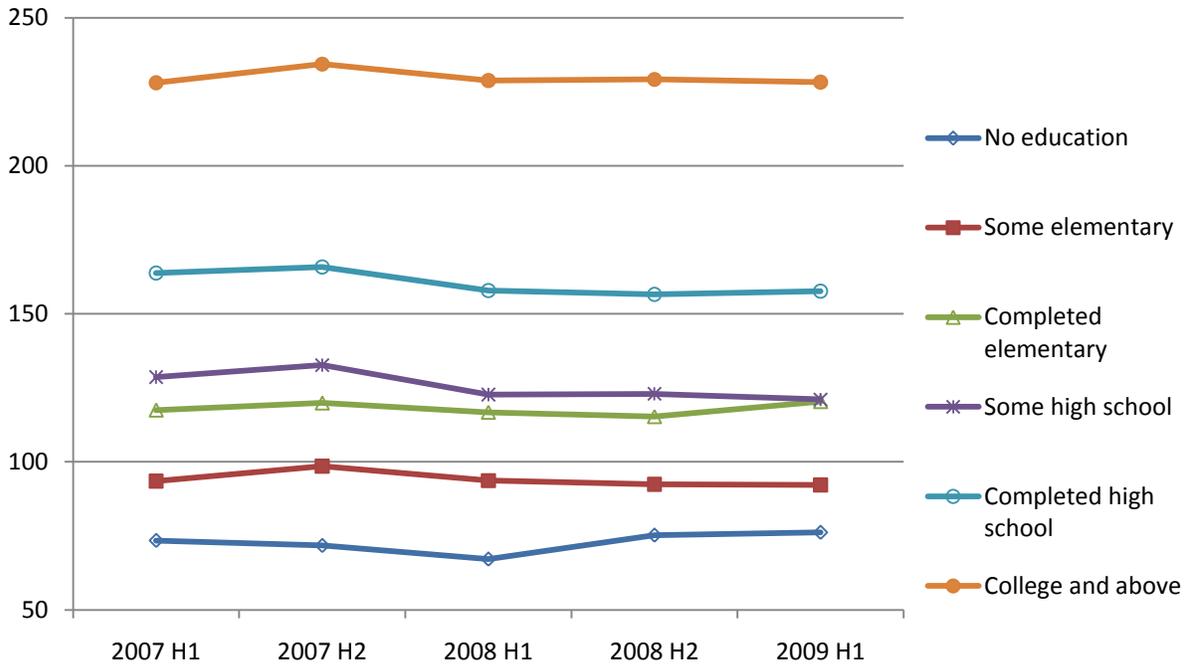


Note: Persons aged 15 years and over. Definitions were revised in the underlying series in 2005; data are not strictly comparable. Results for 2009 are for January-June. The 1997-1998 and 2008-2009 crises are indicated with vertical lines.

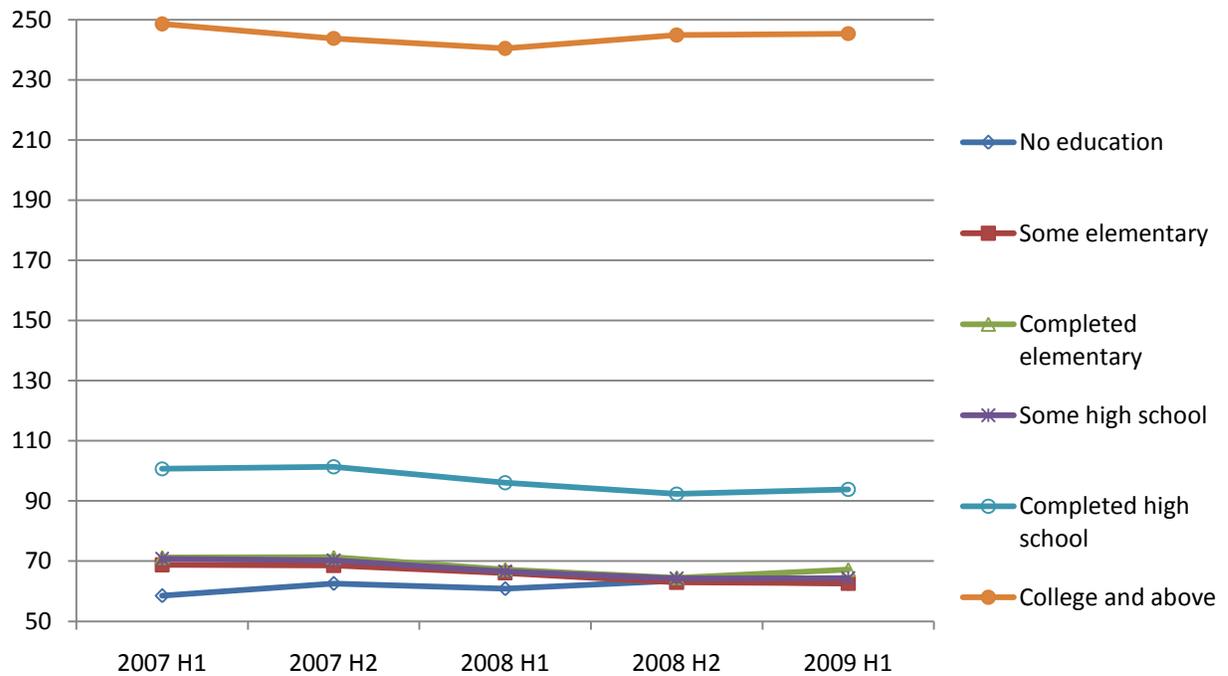
Source: Authors' manipulations based on ILO (various years) and NSO (various years).

Figure 6. Real Daily Wage Rates by Gender and Education Groups, 2007-2009

Panel A: Men



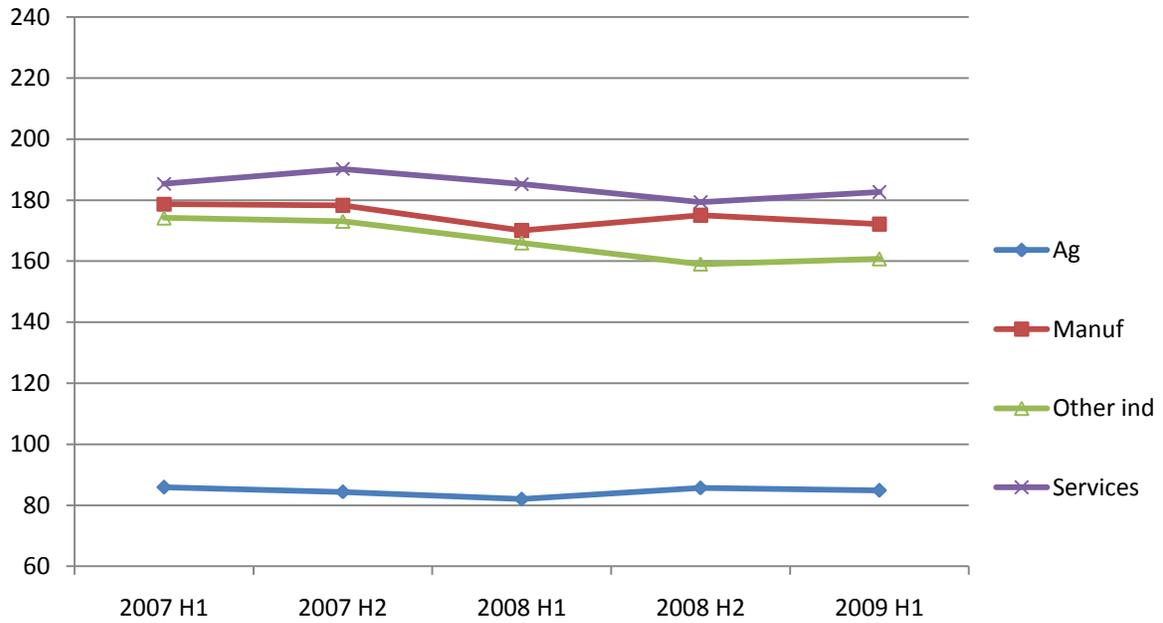
Panel B: Women



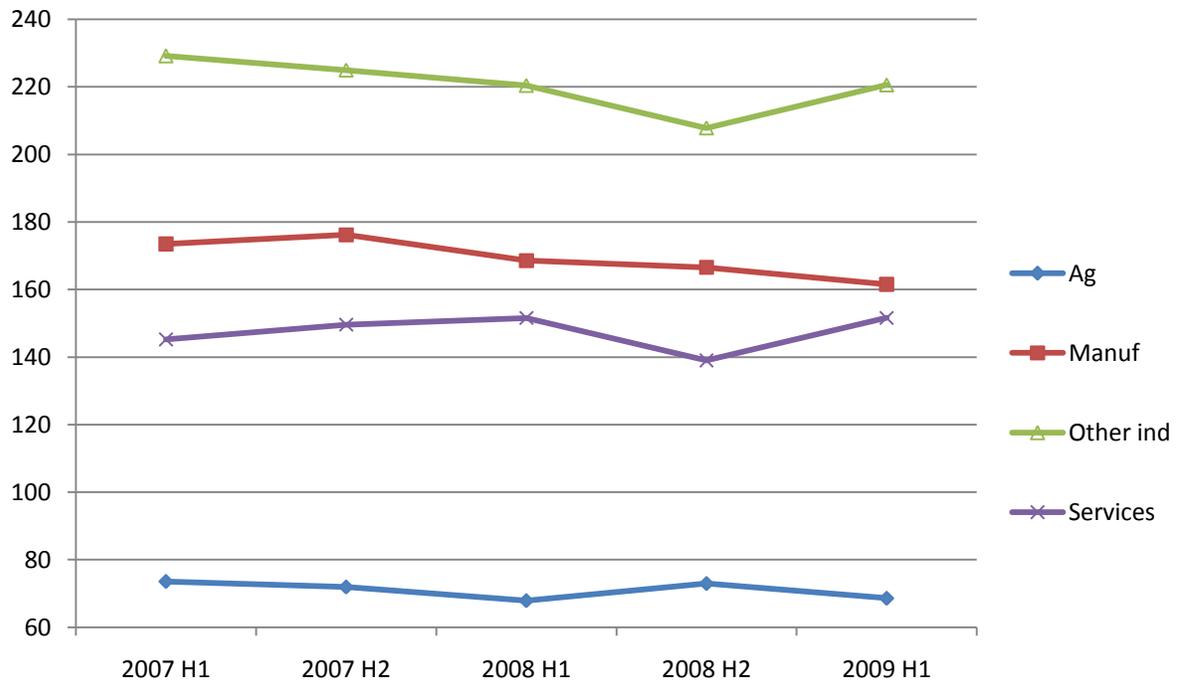
Source: Authors' calculations based on NSO (various years).

Figure 7. Real Daily Wage Changes by Gender and Sector of Production, 2007-2009

Panel A: Men

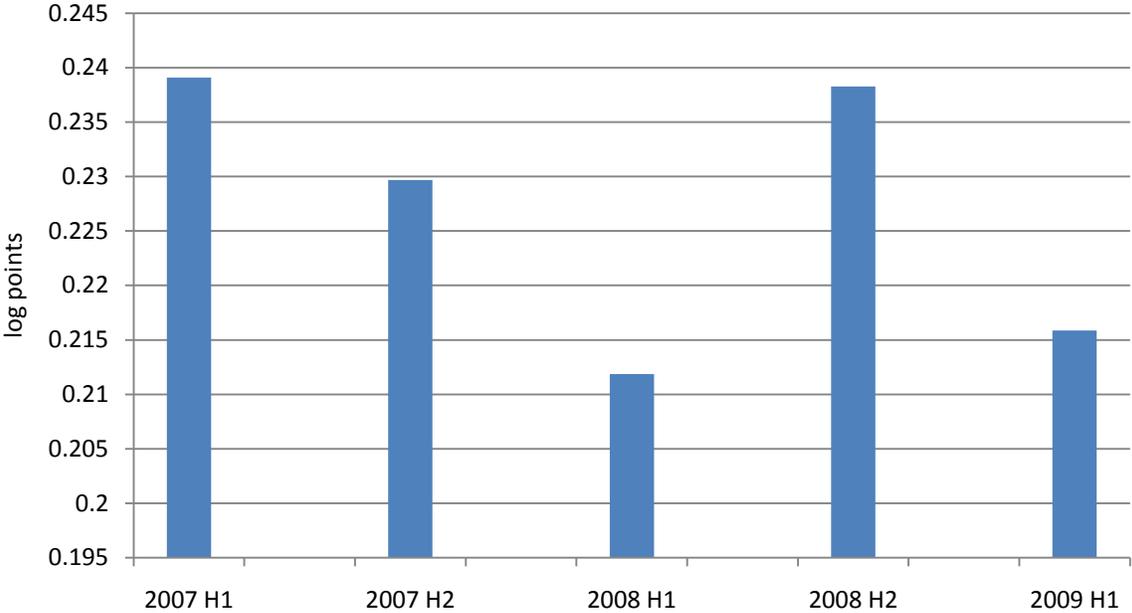


Panel B: Women



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

Figure 8. Log Residual Wage Gap, 2007-2009



Note: H1 and H2 denote the first half and second half of the years indicated.

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

Endnotes

¹ 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 2010a).

² 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.* 2009).

³ The second half of 2009 had not yet been released at the time of writing.

⁴ As a robustness check, we estimated multinomial logit and multinomial probit models that allow several categories of employment (either wage worker, self-employed, or unpaid worker) 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 or logit regressions showed that the magnitudes of the significant coefficients measuring economic effects remained about the same. We decided to estimate marginal probit models over the polytomous choice models since the bootstrapping of standard errors for marginal probits is relatively straightforward to implement.

⁵ Because we did not have access to data for the second half of 2009, we also needed to control for seasonality by comparing the first half of 2009 and the first half of 2008 with the first half of 2007 in all the descriptive figures and regression analyses. In an effort to capture the exact crisis periods more precisely, we estimated an alternative set of regressions in which the food and fuel crisis was represented by a dummy for Quarters 2 and 3 of 2008, and the financial crisis was represented by a dummy for Quarter 4 of 2008 and Quarter 1 of 2009, with 2007 as the reference period. Because the seasonality of employment may confound these estimated crisis effects, we chose not to report them, but the results are available upon request.

⁶ Wage employees and employers are classified as formal sector workers in the ILO data, while own-account workers and contributing family workers are classified as informal sector workers.

⁷ A closer look at men's hours worked, however, indicates a small increase in men's hours worked in the agricultural sector (from 33.5 hours per week in 2007 to 35 in 2008) as men tried to stabilize their total earnings.

⁸ In addition, the lower real wages for women workers in manufacturing were accompanied by a small reduction in their hours worked in 2009 (from 48 to 45 hours per week), while men's working hours in manufacturing stayed the same.

⁹ In fact, running a very simple regression of annual real wages from 2001 to 2008 on a linear trend using the ILO data indicates a negative and statistically significant coefficient on the trend variable for male and female wages.