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How Did the Great Recession Affect Different Types of
Workers? Evidence from Seventeen Middle-Income Countries

Yoonyoung Cho
David Newhouse
The World Bank

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How Did the Great Recession Affect Different Types of Workers? Evidence from 17 Middle-Income Countries

Yoonyoung Cho and David Newhouse[*]

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Abstract: This paper examines how different types of workers in 17 middle income countries fared during the great recession. It documents how the crisis altered trends in employment and unemployment, status and sector of employment, and wage and hours of work. Outcomes for different groups varied greatly by country, even after accounting for the size of the downturn. Among active workers, youth experienced the largest adverse impacts on employment, unemployment, and wage employment. Men also experienced disproportionate slowdowns in unemployment and wage employment. Differences by education and urban and rural location were milder, except in Latvia and Lithuania where the crisis was particularly devastating. No group consistently experienced larger falls in wages. The results suggest scope for targeting employment re-activation programs towards affected groups, particularly in the most severely distressed countries, and reinforce the importance of country-specific data for policy design.

1   Introduction

Labor market outcomes are a critical determinant of household well-being during a crisis, especially in developing countries where labor is usually the main source of income. Understanding how labor market outcomes changed for different groups is therefore a critical first step in implementing appropriate and well-targeted policies to respond to the crisis. This paper examines *which groups of workers were most affected by the shock, and along what dimensions*? The analysis sets aside other important dimensions affecting household well-being, such as changes in consumption patterns or non-labor income such as transfers, and focuses only on changes in labor market outcomes.

We examine changes in labor market trends for different types of workers, defined by their gender, age, education, and urban or rural residence. The outcomes measure aspects of individuals' main labor market activities and job quality. They include the ratios of employment, unemployment, and non-participation to total population, rates of unemployment, wage employment, and agricultural employment among the active labor force, and changes in wages, hours worked, and earnings among workers. We focus on the relative performance of each group and how their labor market trends changed during the crisis. For example, youth are almost always less likely to be employed than adults, but if the employment gap between youth and adults widened more rapidly after the crisis than before, we conclude that the crisis disproportionately affected youth employment.

Our main findings are as follows. Employment slowdowns during the crisis were largest for men (compared to women), followed by youth (compared to older workers). Among those active in the labor force, however, impacts were most severe for youth, due to dramatic declines in wage employment and large increases in unemployment rates. Active men, to a lesser extent, also suffered disproportionate declines in wage employment and increases in unemployment. Differences across education levels among active workers were often small, except in Latvia and Lithuania, where falls in wage employment losses were heaviest for the less educated. Differences across urban and rural residences were also small, though earnings and hours, if anything, fell more in rural areas.

While this evidence is descriptive and preliminary, the age and gender disparities likely result from decisions by both firms and workers. Differences in participation behavior contributed to disparities, as youth and men tended to drop out of the labor force, while women and adult were more likely to remain or become active. Unlike some previous crises, however, there is little evidence that women shifted into self-employment, except in the most severely stricken countries. On the firm side, declines in labor demand appear to be most acute for youth, as firm hiring and firing decisions likely favored more experienced workers. Greater employment loss among men may also partially reflect occupational segregation, as in many cases men were overrepresented in export and construction sectors, which were severely affected by the crisis. While the wage data are limited, neither youth nor men

experienced disproportionate reductions in wages or hours, suggesting that greater reductions in labor demand for youth and men led to larger employment losses rather than wage reductions.[2]

This paper is organized as follows. Section 2 reviews existing studies that investigate explanations of why labor market adjustments vary for different types of workers. Section 3 describes the data and methodology used in the analysis. Section 4 presents aggregate patterns of labor market adjustment for different indicators, and Section 5 discusses the effects of the crisis on each group of workers' outcomes. Section 6 concludes the paper.

2   What explains differential impacts across groups?

Studies of past crises and the current great recession typically refer to three potential mechanisms to explain particular groups' vulnerability to economic downturns. These are: Differences in workers' initial exposure to the shock, firms' employment decision during a downturn, and workers' labor market behavior in response to household income declines.

Sectoral employment differences are particularly salient for women.[3] Worldwide, women are moderately more likely than men to work in the service sector rather than the industrial sector (ILO, 2010b).[4] Initially, the brunt of the current crisis was borne by workers in heavily affected sectors such as manufacturing, construction, and financial services. Partly as a result of occupational segregation, both current and past recessions in the United States have caused greater job losses for men, who are disproportionately represented in vulnerable sectors (Elsby et al., 2010). In Canada and Finland, initial reductions in employment during the current recession were also greater in male-dominated sectors such as manufacturing, construction, and finance (ILO, 2010b). In several Asian countries, however, women are well-represented in the manufacturing sector, which raised concerns that women were particularly vulnerable to employment losses during this downturn (ILO, 2010b, World Bank, 2009, Whalby, 2009).

 In contrast to gender, little evidence exists regarding occupational segregation by age, education, and region. Youth in the UK are disproportionately likely to work in low-paying industries and occupations. (Bell and Blanchflower, 2010), but it is not clear whether these low-paying industries were most severely affected by the crisis. Furthermore, additional analysis suggests occupational segregation among youth was not a main factor increasing youth unemployment during this crisis. A study of several European and North American countries found mixed evidence of a link between pre-crisis patterns of youth employment and subsequent youth employment increases; there was a marked relationship for

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[2] It is also possible that the wage differences between groups are also mitigated by selection rather than rigidity. For example, average wages could rise for youth despite greater declines in demand if the lowest-wage youth were rationed out of jobs.

[3] See, for example, Polochek (1979, 1985) and other references in Altonji and Blank (1999)

[4] The ILO estimates that, in 2009, 47 percent of women worldwide worked in services, while 37 percent worked in agriculture and 16 in manufacturing. The corresponding percentages for men are 40, 33, and 27. Unfortunately, the ILO's Key Indicators of the Labor Market does not disaggregate sectoral employment by age, education, or region.

construction but none for manufacturing (Verick, 2009). With respect to differences in education and region, less educated and rural workers are more likely to participate in agriculture, which may help insulate them from this and other downturns. We know of no study, however, that describes in detail how sectoral employment patterns depend on education and region.

The second main mechanism that can explain differential impacts are firm employment decisions. Firms can respond to a crisis by adjusting employment, wages, and hours. Workers' level of firm specific skills, labor market attachment, and labor market regulations all influence firms' employment decisions. In particular, firms may find young and unskilled workers more dispensable because they have acquired fewer important firm-specific skills (World Bank, 2009). Firms may shed female workers first because they are less attached to the labor market, due to child-rearing career disruptions, or because they are less likely to be bread winners. During the Asian financial crisis, South Korean women experienced 7 times higher lay off rates than men (Seguino, 2009). Another possibility is that labor regulations affect firms' demand for certain groups during a crisis. Minimum wages, for example, may reduce firms' downward wage flexibility for young and unskilled workers, who tend to earn lower wages. This could lead to greater reductions in employment and increases in unemployment among these groups. Finally, existing employment protection legislation such as severance pay, restrictions on collective dismissals, and conditions for termed contracts can also disproportionally affect new workers vis-à-vis incumbent ones. Indeed, the proportion of youth in temporary contracts, who would have limited benefit packages, is rising in the advanced economies (OECD, 2010). However, there is little evidence on the role of labor market regulations during a crisis. While one study suggested that employment protection legislation may have prevented a surge of layoffs among young workers in Europe (Verick, 2009), evidence on how these regulations affect different types of workers during a crisis remains limited.

The third main mechanism that can contribute to differential impacts on employment and unemployment is household labor supply decisions. The most commonly invoked pattern is the added worker effect, where women compensate for falls in household income by rejoining the workforce. During Argentina's financial crisis, for example, job exits increased for both men and women, but employment losses for women were less due to an increase in job entry.[5] In theory, youth could face similar pressures; families facing job loss or a fall in real income may withdraw youth from school, or idle youth may be forced to work. Evidence from the Mexican tequila crisis, however, indicates that most of the burden of the adjustment, in terms of increased labor force participation, fell on wives rather than children (Skoufias and Parker, 2006). In rural areas, employment declines may be smaller, if women and youth joining the workforce find it particularly convenient to enter family businesses, which are more common in rural areas.

How have these three mechanisms affected the vulnerability of different groups during downturns? While several studies have examined households' vulnerability to crises, fewer have documented their

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[5] See McKenzie (2004).

effects on individual workers.[6] Most studies of crisis impacts focus on Europe and the United States (Verick, 2009, OECD, 2010, Elsby et al., 2010,) or highlight the experience of particular groups or countries (ILO 2010a, 2010b, Ha et al., 2010, Leung et al., 2009).

The best existing evidence on the effect of past crises on workers' income and employment exploits longitudinal data from Indonesia and Urban Argentina. Men and women experienced equally destructive falls in real wages in both Indonesia and Argentina. Employment patterns were different, however. In Indonesia, female employment fell markedly less than male employment, as women entered self and family employment to offset job losses in the formal sector (Smith et al, 2002). Employment in medium and large manufacturing firms also declined more for men than women, as women were overrepresented in larger and exporting firms, which were more resilient to the crisis. (Hallward-Driemeier et al, 2010). During Argentina's 1995 crisis, however, employment fell equally for both men and women. (Mckenzie, 2004) In the current crisis, preliminary ILO estimates suggest that men and women have experienced roughly equal increases in unemployment, from which they conclude that the downturn has affected male and female outcomes more or less equally (ILO, 2010).

Preliminary studies of the current crisis have emphasized large increases in youth unemployment (Ha et al., 2010, IMF and ILO, 2010, Bell and Blanchflower, 2010, Verick, 2010, OECD 2010). Most of this evidence is from OECD countries, and indicates that youth unemployment skyrocketed in 2009. In addition, there are some indications that youth were more likely to shift to informal sector employment in six Latin American countries (Ha et al., 2010). This appears to be more consistent with past experience in Indonesia than Argentina. In Indonesia, employment declined slightly more for youth than adults, largely because older women rejoined the labor force in large numbers. Young workers, particularly women, experienced somewhat larger wage declines than their older counterparts. In Argentina, meanwhile, young and old workers experienced similar wage and employment changes.

The experience of educated workers depends on the nature of the crisis, although some studies suggest the current crisis has led to larger employment reductions for less educated workers. In the US, the current recession has reduced employment more for less skilled workers (Elsby et al., 2010). In South Africa, additional education substantially reduced the risk of employment loss (Leung et al., 2010). Finally, preliminary evidence from China suggests that the crisis disproportionately affected unskilled migrant workers (Cai et al., 2010).[7] In contrast, during the Indonesian and Argentinian crises, better educated women were most severely affected. In both countries, declines in incomes were similar for less educated and better educated men, but significantly larger for educated women than less educated women. Educated women were also particularly likely to lose their job or exit employment in both cases.

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[6] Households' vulnerability and response to economic crises has been explored in Peru (Glewwe and Hall, 1998), Mexico (Cunningham and Maloney, 2001 and Mckenzie, 2004), Russia (Lokshin and Ravallion, 2003), Indonesia (Strauss et al., 2004) and Argentina (Corbacho et al., 2007), among others.

[7] Mixed results are also found when looking at household income or consumption. Households with better educated heads experienced smaller consumption drops in Peru and Argentina (Glewwe and Hall, 1998 and Corbacho et al., 2007) but larger income and consumption reductions in Mexico (Mckenzie, 2004)

We know of no analysis of the effects of the current crisis on urban and rural workers. Review of previous crises showed, however, that the initial impact of financial crisis hit harder the urban manufacture and construction sector at least initially.[8] During the 1998 financial crisis in Indonesia, both overall and salaried employment declines were larger in urban areas, and urban women suffered substantially larger wage declines than rural women.

To sum up, existing empirical evidence from past and present crises suggests four hypotheses:

- Men and women experienced roughly equal falls in income and employment, although in some settings, the added worker effect may lead to smaller falls among women.
- Young workers experienced greater increases in unemployment and self-employment than adult workers.
- Impacts on less educated workers were more severe than better educated results, but the results depend on the country context and the nature of the shock.
- The shocks may have reduced employment and earnings more for urban workers than rural workers.

Evidence on the vulnerability of different types of workers to this shock remains quite limited. Past crises in Argentina and Indonesia may not be relevant to the current great recession, since the macroeconomic causes and consequences are very different.[9] Most initial evidence on the current crisis focuses on how unemployment has risen for particular groups and is often limited to OECD or European countries. This is the first study, to our knowledge, that compares disparate impacts across several groups and countries.

3   Data and Methodology

3.1   Data

This analysis draws on repeated cross sectional household data. The micro data contain information on a wider variety of job and worker characteristics, including job status (e.g., wage and salary employment versus self-employment or family work) and sector (agriculture vs. non-agriculture), in addition to participation, employment, unemployment, and hours and earnings. In some countries, these data also contain information on household responses to the crises and individuals' labor market transitions during the crisis, but these topics are left for future research.

The data represent 17 countries (Table 1).[10] These include five Latin American and Caribbean countries (Argentina, Brazil, Chile, Costa Rica and Mexico), seven European and Central Asian countries (Bulgaria,

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[8] See Fallon and Lucas (2002).
[9] In particular, exchange rates have changed relatively little during this crisis, while both Argentina and Indonesia experienced extraordinary currency devaluations during their crises.
[10] For European countries, we use Eurostat Survey data instead of individual country's Labor Force Survey, which were not available. Eurostat provides the mean of key labor market indicators by demographic cells. For European countries, age, education, and gender estimates rely on data from the 8 cells defined by the three characteristics, while urban/rural estimates rely on a separate set of 8 cells defined by residence, age, and gender.

Latvia, Lithuania, Macedonia, Poland, Romania and Turkey), two counties in East Asia (Indonesia and the Philippines) two countries in Middle East and North Africa countries (Egypt and Jordan) and South Africa. Countries differ in terms of the indicators collected, span and frequency of data, and coverage of rural areas: ECA countries do not report hours, earnings, and sector, and include only the means of key variables by demographic cell rather than individual workers' outcomes; three LAC countries cover only urban areas, and earnings are often reported for salaried workers. The size of the shock is measured as a change in GDP growth rates in 2009,[11] and varies widely, from 1.9 percentage points in Indonesia to 22 percentage points in Lithuania. Europe and Latin American countries are over-represented in the data, but these were the two regions most affected by the shock.

Our analysis examines how seven indicators evolved for workers, disaggregated along four key dimensions. Workers are distinguished according to their gender, age, education and region (urban/rural), which are present in all surveys. In order to accommodate a large variation in the form of data across countries, we classify individuals into 16 cells based on their demographic type, and construct the means of each outcome variable.[12]

The main labor market measures capture aspects of labor market activity and job quality. The activity indicators are the share of the population that is employed, unemployed, and out of labor force, as well as the standard unemployment rate. Changes in these indicators can provide some information on mechanisms of different labor market adjustments. For example, group differences in employment loss could reflect both firm employment decisions and added worker effects, but the former is more consistent with increases in unemployment while the latter could be explained by smaller declines in participation. To measure job quality, we examine the share of the labor force that is a self-employed or family worker, and the share of working in the agricultural sector, as well as average earnings, hours, and wage rates where available. A significant portion of workers in many developing countries are self-employed working poor, earning small profits, such as smallholder farmers or street retailers. Unemployed or idle adults may be forced to take these low paying jobs to cope with the downturn, in order to mitigate losses to household income during recessions, which would appear as an increase in the share of the labor force in self-employed or agricultural work.

Normative interpretation of the results requires caution because indicators can have ambiguous welfare implications. Changes in economic activities, in particular, are not straightforward to interpret. Greater employment declines for men than women, for example, do not imply that men were more disadvantaged during the crisis. Gender employment disparities, for example, may partly reflect men suffering from their over-representation in distressed sectors, in addition to women suffering from an increase in female distress work. Compared with changes in employment and unemployment, declines in wage and salaried employment, non-agricultural employment, and wage rates can more confidently be interpreted as a welfare loss, largely because wage and salaried jobs and non-agricultural jobs tend

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[11] The slowdown is calculated as the difference between GDP growth rate in 2009 and the average GDP growth rates over 2007-2008. See Appendix Table A1 for calculation of slowdown in GDP growth rates in each country.
[12] For detailed information on data construction for our analysis, refer to the technical note in the Appendix.

to be more productive and offer greater access to benefits. [13] Changes in earnings and wage rates also relate directly to changes in workers' income, but there are important concerns about the coverage and accuracy of earnings data. Fewer countries collect earnings data than employment data, and some countries only collect earnings data for salaried workers. The profits of self-employed workers are notoriously difficult to measure accurately, and inaccurate measures of inflation can also introduce additional noise into earnings data.[14]

3.2   Methodology

The focus is on how the crisis altered labor market trends and how disruptions varied across different group of workers. A simple way of looking into crisis impact on various groups of workers is to compare pre and post outcomes for each group. However, this comparison may be misleading if baseline trends in labor market vary across groups. Even before the crisis, socioeconomic changes in these countries were affecting different groups in different ways. For example, in many countries, employment rates were growing faster for women than men, due to trends in educational achievement and cultural norms that encourage greater female employment. To take this into account, the analysis examines how each group's trend changed, relative to their pre-crisis trend. In other words, the key indicator is the rate at which changes in each indicator slowed down or sped up, compared across groups.

Accounting for differences in pre-crisis trends can affect the size of group differences. For example, the Mexican male employment ratio – the percentage of men employed –declined slightly before the crisis by 0.5 percentage points, from 80.0% in 2007 to 79.5% in 2008. After the crisis, the male employment ratio fell by 2.2 percentage points to 77.3% in 2009. For women in Mexico, the employment ratio changed little, increasingly only 0.2 percentage points from 45.9% in 2007 to 46.1% in 2008, before falling moderately -- by 0.9 percentage points -- in 2009. The slowdown in employment was therefore greater for men (1.7 percentage points) than for women (1.1 percentage points) by 0.6 percentage points. Considering only post-crisis changes would give a 1.3 percentage point difference between male and female employment changes, which may overstate the effect of the crisis on male employment.

Workers are divided into 16 cells, based on their gender, age, education and location of residence. Only workers between age 15 and 64 are included in the sample. Age is broken into youth (age 15-24) and adults (age of 25-64) and education is grouped into least educated (primary schooling) and more

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[13] This does not imply or assume that all self-employed workers are unproductive, or that all self-employed workers are excluded from wage employment, as many workers are self-employed by choice. Workers often choose to start a business, for example, because they have acquired sufficient assets to earn greater profits in self-employment, or because they value time flexibility. The use of wage employment as a proxy for changes in job quality during the crisis is based on the plausible assumption that the downturn, rather than raising preferences for self-employment among workers, reduced demand for wage workers. If wages are rigid, then reductions in demand would ration workers out of wage employment jobs, forcing them to enter self-employment.

[14] Comparing changes in urban and rural earnings is also problematic in countries that only collect price indices in urban areas.

educated (secondary level and above).[15] Weighted average outcomes are taken for each cell, country, and survey, before calculating the difference between average pre and post-crisis year on year changes for each cell. We then regress this difference on dummy variables for the four characteristics, for each outcome and country.[16] Using regressions rather than simple tabulations isolates changes in the returns to a single characteristic, independent of the other three; for example, a rise in the coefficient on youth unemployment cannot be attributed to higher education levels among youth.[17]

While each country suffered falls in economic growth, countries can be divided into four groups based on the severity of the crisis. Countries in Asia tended to be less affected by the crisis, while countries in Europe suffered the largest declines in growth. Latvia and Lithuania in particular suffered tremendous economic disruptions, as growth rates in these countries slowed by roughly 20 percentage points in 2009, compared to the average growth rates in the two prior years. Turkey, Romania, Bulgaria, and Mexico also suffered severe slowdowns in growth, due to a decline in exports to Western Europe and the US. In contrast, a larger group of seven countries, including the non-Mexican Latin countries, Poland, Jordan, the Philippines, and South Africa were only moderately affected. Finally, Indonesia and Egypt escaped the brunt of the crisis, as growth only fell around 2 percentage points.

4 Aggregate labor market adjustments

The crisis led to large adjustments in labor market conditions. Figures 1-3 show the labor market adjustments for all individuals (Figure 1), labor force participants (Figure 2), and workers (Figure 3), sorting by the magnitude of the shock. The horizontal axis indicates the severity of the crisis, as shown in Table 1. The vertical axis is defined as slowdown in each indicator. For example, the average year on year employment rates changes over 2006, 2007, and 2008 in Lithuania were 63.6, 64.9, and 64.3 percent, respectively, and the average yearly change over 2006-2008 was 0.4 percentage points. The year on year change in employment in 2009 was -4.2 percentage points as employment rate changes from 64.3 to 60.1 percent. The difference between these two changes for each country (-4.6 percentage points for Lithuania) is plotted in Figure 1.[18]

More severely affected countries tended to experience larger declines in employment and increases in unemployment, but there is considerable variation across countries. Poland, Costa Rica, and Bulgaria, for example, experienced unexpectedly large employment losses, based on the severity, while Romania and Turkey experienced substantially smaller reductions.[19] These patterns suggest that employment

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[15] In ECA countries, as their education level is higher than other regions, the least educated group is those with secondary education or below.

[16] Observations are weighted both by the population weight for that cell, and by the number of unweighted observations used to generate the average, to adjust for heteroscedasticity in the cell mean outcomes.

[17] See Appendix B for the specification and a discussion of the regression model.

[18] Two letters in Figures represent each country: AR (Argentina), BG (Bulgaria), BR (Brazil), CH (Chile), CR (Costa Rica), EG (Egypt), ID (Indonesia), JO (Jordan), LT (Lithuania), LV (Latvia), ME (Mexico), PH (Philippines), PL (Poland), RO (Romania), SA (South Africa), and TR (Turkey).

[19] This is consistent with findings from Crisis Survey in Turkey. See World Bank (2010).

slowdown may not be related to labor market rigidity. For example, Turkey and Romania were able to maintain employment and wage employment, even though Turkey is probably among the most regulated labor markets in the OECD, with a low *Doing Business* ranking in employing workers, and 40 percent of Romanian workers belong to a union.[20] Costa Rica and Bulgaria, where employment fell more, have relatively free labor markets. Both countries score relatively highly on the Fraser index of labor market freedom, and only 13 percent of Costa Rican workers belong to a union. If labor markets with high firing costs responded to the crisis by reducing hours rather than shedding employment, employment loss may have been smaller in more rigid countries.[21] This is line with evidence that employment during the crisis fell slightly less in countries with higher firing costs (Khanna et al, forthcoming). Other studies also cast doubt on the link between existing measures of institutions and worse employment outcomes (Baker et al., 2004, Freeman, 2005).

Employment declines are generally more reflected in unemployment increases than declines in participation [22] However, the extent of this adjustment also varies across countries. Bulgaria and Poland, for example, experienced greater employment losses than would be expected based on the severity of the shock. While Bulgaria's employment losses were largely explained by an increase in nonparticipation, large employment losses in Poland were entirely linked to unemployment increases. These patterns may be related to their labor market policy such as unemployment insurance. Poland's unemployment insurance has relatively high coverage and impacts compared to other East European countries, which may reduce the incentive of unemployed workers to leave the labor market (Vodopivec, 2009).

Labor markets also adjusted through declines in the share of wage employment among the labor force, but there is little evidence of large increases in self-employment. Declines in the share of wage employment were greater for more severely affected countries. Latvia and Lithuania experienced large declines in wage employment and slight shifts to self-employment. In other countries, declines in wage employment did not lead to an increase in self-employment. This suggests that self-employment did not serve as an informal safety net by absorbing displaced workers, except to a limited extent in the most severely affected countries. This is consistent with the small changes in the share of agricultural employment in most countries.[23]

Earnings slowed due to declines in both hours and wage growth, but there was no discernible relationship between these indicators and the severity of the GDP shock. Figure 3 shows changes for earnings, hours, and wage rates, which unfortunately is limited to 6 countries. In some countries, such as Argentina and Costa Rica, earnings decreases were driven by declines in hours, while in other

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[20] Turkey ranked at 145 out of 183 countries in 'employing workers' in *2010 Doing Business,* which reflects labor market rigidity with substantial hiring and firing costs.

[21] Unfortunately, hours information on these rigid countries mentioned is not available.

[22] Note by definition that the share of employed, unemployed, and out of labor force workers sums up to one, and the changes of each share sums up to zero.

[23] Egypt is an outlier where wage employment increased and share of self employment and agricultural employment decreased. Given the openness of Egypt to the international financial market, economic slowdown in Egypt must be largely affected by the food price crisis rather than the financial crisis, which may explain a large slowdown in agriculture. A decrease in agriculture is probably highly associated with a decline in self employment and a slight increase in wage employment.

countries such as Mexico and Jordan earnings declined were mainly due to decreased wage rates. Wage rate declines do not appear to be systematically related to changes in self-employment and agricultural employment. Self-employment rates changed little in Jordan, despite a large decline in wage rates. Egypt, on the other hand, experienced even larger declines in wage rates despite falling self employment and agricultural employment. This suggests that the extent to which declines in labor demand translate into wage declines varies from country to country.

Changes in labor market outcomes separately by gender showed similar patterns, but there were important gender differences in some indicators and countries[24] Decreases in employment and wage employment, and increases in unemployment are greater for men than women, and the gender disparity is generally larger in more severe affected countries. Shifts to self-employment observed in Latvia and Lithuania, and a large decline in self employment and agriculture in Egypt appear to be driven largely by women. Median changes in earnings, hours, and wage rates are similar for both genders with no significant correlation with the severity of shock, but the variance across countries are slightly larger for women. Gender disparities in outcomes of interest are further discussed in the following section.

5   Differences in groups' adjustments.

This section examines how adjustments varied for different types of workers. As discussed above, we examine how trends in indicators changed, conditional on gender (men relative to women), age (young relative to older workers), education (less educated relative to highly-educated workers), and location (urban relative to rural workers). Figures 4 through 12 show group comparisons, in which the vertical axis represents the percentage point adjustment in the indicator, and the horizontal axis again indicates the slowdown in GDP growth. Each point represents a coefficient from a regression for a particular country, in which the dependent variable is the difference between the year on year change in the indicator in 2009, minus the average year on year change between 2007 and 2008. The independent variables in the regression are dummy variables for men, youth, less educated, and urban residence. There are 16 observations in each regression, one for each of the 16 cells defined by these four characteristics.[25][26] For convenience, throughout this section we refer to these as changes for particular groups as if they were simple unconditional trends, even though they are in fact conditional regression coefficients.[27] In addition, the words slowdown and fall, acceleration and rise, and change and

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[24] Average adjustments in changes of the 10 indicators are presented separately by gender. See Appendix Table A2.

[25] As mentioned above, in European countries, the full 16 cells are unavailable. In these countries, cells defined by gender, age, and education are used for those three groups, while cells by urban residence, age, and gender are used to generate urban/rural disparities.

[26] We repeated a similar exercise separately for each gender. The median coefficient is presented in Appendix Table B1, which show group comparisons by age, education, and location within each gender.

[27] We also generated unconditional results and the patterns are qualitatively similar to the conditional results in all cases.

adjustment are all used interchangeably during the discussion, and all refer to the change in the rate of year on year change.[28]

5.1 Population trends: Employment, Unemployment, and Participation

Trends in employment, unemployment, and non-participation rates as a share of the population are an informative indicator of primary activity for each group. These indicators are also appealing because employment changes can be decomposed into the portion attributable to increases in unemployment and non-participation, which has important implications for the nature of the adjustment. Also, population trends may be relevant for policies, such as universal transfers, that are delivered outside the labor market.

Employment typically slowed most for men, youth, the better educated, and urban residents. Male employment, as a share of the population, slowed more than female employment in three quarters of the 17 countries (left panel of figure 4). Similarly, the second panel shows that youth employment slowed more than adult employment in 13 of 17 countries. The third panel tells a similar story for education, where employment slowed more for more educated workers in 14 of 17 countries. Finally, the rightmost panel shows that in 7 of 9 countries, employment slowed more in urban areas than rural areas, though differences were small in several cases. Employment disparities across groups were generally larger in countries with the greater declines in GDP growth, although there were several countries with small GDP declines where youth employment disproportionately fell.

Disparities in employment adjustments were sizeable, when compared with overall employment declines. This is true even in Latvia and Lithuania, where overall employment rates fell by a hefty 5 to 9 percentage points (figure 1). In these two countries, employment, for example, fell by 6 percentage points more for men, 2 to 4 percentage points more for youth, and 2 to 6 percentage points more for least educated. In Costa Rica, where overall employment fell by about 2.5 percentage points, the 4 percentage point disparity faced by young workers is very large in comparison.

Male and youth employment losses are reflected in larger increases in both unemployment and non-participation. As mentioned above, disproportionate employment losses for particular groups can be explained, in an accounting sense, by a combination of differential increases in the share of the population that is unemployed and not participating. For men, both unemployment and non-participation rose more for men than for women, as seen in the left panel of figure 5 and 6. The same is true for youth, though non-participation appeared to play a slightly larger role than unemployment in explaining youth's disproportionate employment decline. In contrast, less educated tended to exit the labor force rather than remain unemployed, while the opposite is true for urban workers.

In sum, employment ratios fell disproportionately for male, young, urban, and more educated workers. Employment disparities, in general, however, varied greatly by country. Employment reductions for men and young workers were reflected both in increases in unemployment and non-participation.

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[28] For example, a negative coefficient on the youth dummy in the employment regression is described as "youth employment fell" or "Youth employment slowed".

Employment declines for more educated workers, on the other hand, were driven by larger unemployment increases, while declines in participation account for declines in employment among urban workers.

5.2 Labor force trends: Unemployment, Sector, and Status

To better understand changes among potential workers and to inform the design of labor market programs, we examine labor market outcomes for the active labor force. Active workers are either working or unemployed, and those that are working can be divided into self-employed or wage workers, or agricultural and non-agricultural workers. In many developing countries, a large portion of workers are self-employed or unpaid family workers in low-productivity jobs, particularly in the agriculture and service sectors. Workers may adjust to large shocks by migrating into these types of low-productivity jobs, where entry barriers are low, as occurred in Indonesia during the East Asian crisis. To assess changes in different types of jobs, figures 7 through 10 show disparities in changes in unemployment, wage employment, self-employment, and agricultural employment shares among those active in the labor force.

Unemployment rate increases were largest for youth. The second panel of figure 7 shows large disparities in increases in the unemployment rate relative to adults, averaging about 2.5 percentage points. The unemployment rate increased more for youth than for adults in all countries except Jordan and Egypt, while only Jordan showed a significant disproportionate decline in youth unemployment. There is no clear relationship between the size of the shock and the increase in youth unemployment, however. Disparities were largest in Latvia and Lithuania, but they were also large in Costa Rica, Poland, and Indonesia – countries that escaped the full brunt of the crisis.

Unemployment rates also increased more for men and urban workers, but difference were more muted. Gender disparities in unemployment rates were not large, with male increases typically one half to one percentage point greater. Unemployment increased significantly more for women in only 3 of the 17 countries, and disproportionate male increases in unemployment were particularly large in Latvia and Lithuania. Urban workers also experienced larger rises in unemployment, in 7 of the 10 countries for which data are available, but the disparity tended to be small.

Shifts out of wage employment tended to be greatest for youth, and male workers also experienced slight declines (figure 8). In 15 of 17 countries, wage employment rates declined more for youth than adults, while declines were larger for men than women in 13 countries. Differences between youth and adults were particularly large, as increases exceeded 3 percentage points in seven countries. The gender and education disparities shown in median are largely driven by Latvia and Lithuania where wage employment was greatly reduced for male and less educated workers. For the other countries, disparities in education are less clear. Similarly, differences between urban and rural residents are not systematic.

Increases in self-employment, while smaller, were most apparent for young and less educated workers. Disparities in self-employment were smaller than unemployment or wage employment, but are noticeable for youth and less educated workers. Youth rates of self-employment disproportionately increased in 11 out of 17 countries, and in seven countries, the disparity ranged from 1 to 2 percentage points. Meanwhile, less educated workers also experienced increases in self-employment in 10 countries, though only in Latvia, South Africa, and Lithuania did the disparity exceed 2 percentage points. This pattern suggests that youth displaced from wage employment remained unemployed rather than shift into self-employment, while less educated workers tended be enter self-employment instead.

*There are few disparities in agricultural employment. F*igure 10 shows how shifts into the agricultural sector varied for different groups. Agricultural jobs tend to be less productive on average than industry or service sector jobs, making this a useful supplemental measure of job quality, but unfortunately information on sector is only available in half the countries. Agricultural employment rates increased slightly more for men than women, but the differences are small and there are no consistent patterns across other groups.

Overall, differences between types of active workers were largest for youth, and most apparent in unemployment increases and wage employment declines. Unemployment increases among youth could result from higher reservation wages among youth, whose lifetime earnings may be more sensitive to their current job. Differences in unemployment increases and wage employment declines were smaller but noticeable for male and less educated workers. Less educated workers, however, were slightly more likely to shift out of wage employment into self-employment, which partially mitigated their employment loss.

5.3 Job trends: Wages, Hours, and Earnings.

Few patterns emerge with respect to wage changes. Figure 11 shows adjustments in hourly wage changes, which is unfortunately only available for 7 countries. Male, urban, and youth wages fell less in Egypt and Indonesia, two countries not heavily affected by the crisis, though wage data in Indonesia is only collected for salaried employees. Meanwhile, wages fell more for men in Argentina and Costa Rica, and more for youth in Argentina and Jordan. In Mexico, the country with available data that was hit hardest by the crisis, there are essentially no wage disparities across any group.

Hours and earnings disparities also vary greatly from country to country. With respect to hours, men experienced much larger declines in Egypt but larger increases in Argentina, Costa Rica, and negligible differences in Mexico, the Philippines, and Indonesia. The results for hours are similarly scattered for youth and education disparities, and since there are few systematic differences in wages, this is also reflected in the earnings changes in figure 12. The results in the first three panels, showing gender, age, and education disparities, show no clear patterns across countries. This could partly result from difficulties measuring earnings and inflation in labor force survey data.

Earnings and hours reductions were somewhat larger in urban than rural areas. Reduction in hours were larger in rural than urban areas in four of the six countries (figure 12), while disparities were small in the other two -- Philippines and Indonesia. This led to larger earnings declines in rural areas in all countries except the Philippines, where earnings declines were similar in urban and rural areas. However, due to the small number of countries for which data are available, and the difficulty in collecting real earnings in rural areas, these findings should be treated with appropriate caution.[29]

6 Conclusion

This paper identifies groups in 17 middle income countries that experienced the greatest labor market dislocations during the 2009 financial crisis. Most conjectures about the vulnerability of different groups are based on three potential mechanisms: uneven exposure to the shock across sectors, firms' employment decisions, and households' labor supply decisions in response to the crisis. Empirical findings from this and previous crises, particularly the two well-documented cases in Indonesia and Argentina, suggested four hypotheses: Employment outcomes were similar for men and women, youth experienced greater increases in unemployment, adjustments for less educated workers were more severe, and that the shock reduced employment more in urban areas.

Among active workers, youth experienced the greatest employment dislocations. As in past crises, active young workers experienced large reductions in employment. But youth disparities are stronger when considering active workers, as the shift of young workers from wage employment to unemployment during this crisis was particularly striking. Somewhat surprisingly, however, there is little evidence of disproportionate reductions in hours or wages for youth. It is possible that changes in the types of youth working mask a decline in wages, if for example low-wage youth are more likely to withdraw from the workforce than low-wage adults. However, the estimates control at least in a crude way for education, age, and gender, and the results are also consistent with institutions that prevent group differences in labor demand from being passed through to lower wages.

Unlike past crises, in which men and women experienced similar employment changes, overall employment rates declined markedly more for men. Men experienced larger increases than women in the share of the population unemployed and non-participating. Among active men, there was a small but noticeable shift from wage employment to unemployment. The mild employment declines for men among active workers could result from several factors: Women likely rejoined the labor force in greater numbers, men may have been less flexible in taking a new job and more apt to remain unemployed, or the crisis may have affected male-dominated industries. The latter explanation of occupational segregation, however, would suggest a larger reduction in hours, wages, and earnings for men. The fact that this did not occur suggests that the added worker effect and differences in search behavior were more likely explanations for larger falls in employment rates for active men.

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[29] Difficulties in urban-rural comparisons of wage trends stem both from the difficulty of collecting accurate earnings data for the self-employed (who tend to be more common in urban areas), and from the difficulty of accurately deflating rural earnings, since Consumer Price Indices are typically based on urban prices.

Although women may have rejoined the labor force, they did not enter self-employment except in the worst-hit countries. In this respect, added worker effects during this crisis generally were more similar to the past crisis in urban Argentina, where there was little increase in female self-employment, than Indonesia where female self-employment increased substantially. The exceptions are Latvia and Lithuania, which experienced GDP slowdowns exceeding 20 percentage points, and women experienced much larger increases in self-employment.

There were few noticeable differences by education or urban residence. As in past crises, there were few large disparities across education groups. Wage employment fell more for less educated workers in exactly half of the countries, although there are slight indications that self-employment increased more for less educated workers. The evidence for urban and rural disparities is weaker, but in most countries, urban workers experienced greater falls in hours and earnings dislocations than urban workers.

The results highlight the importance of targeting active labor market programs, providing accurate information on labor market conditions, and possibly increasing wage flexibility for youth. Among those remaining in the labor force, youth tended to experience the greatest declines in wage employment and the greatest increases in unemployment. Although the evidence is limited, there is no indication that wages fell systematically more for youth, and large hours declines for youth were limited to a few countries. This suggests that, compared to adults, declines in demand for youth has led to rationing, denying youth the opportunity to gain employment experience at lower wages. Supply side factors also could contribute. Youth may have less access to information about the labor market than adults, and therefore adjust their reservation wages more slowly. Their longer time horizon may also lead them to search longer, to the extent that their first job affects their future earnings trajectory.

In contrast to youth, there appears to be little evidence to support targeting crisis response programs specifically to urban or less educated workers. Differences among less educated and more educated workers depended greatly on the country, and were only particularly large in Latvia and Lithuania where less educated workers suffered the brunt of the crisis. If anything, rural workers experienced greater declines in hours and earnings growth than urban workers.

Finally, the results confirm the importance of country-specific information when targeting policy responses to crises. Outside of Latvia and Lithuania, the size of disparities between groups was usually weakly related to the size of the shock. Although there was no consistent patterns across countries for many indicators and groups, disparities were often large. Groups in each country responded differently to the shock, meaning that country-specific data is critical to help policymakers gauge the optimal policy response. Furthermore, this study only covers seventeen countries, selected on the basis of data availability, and the patterns of adjustment in other countries may be different. Further development of data collection and dissemination systems will enable the policy response to this and future crises to better serve the needs of the most severely affected workers.

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Table 1: Data used for the analysis

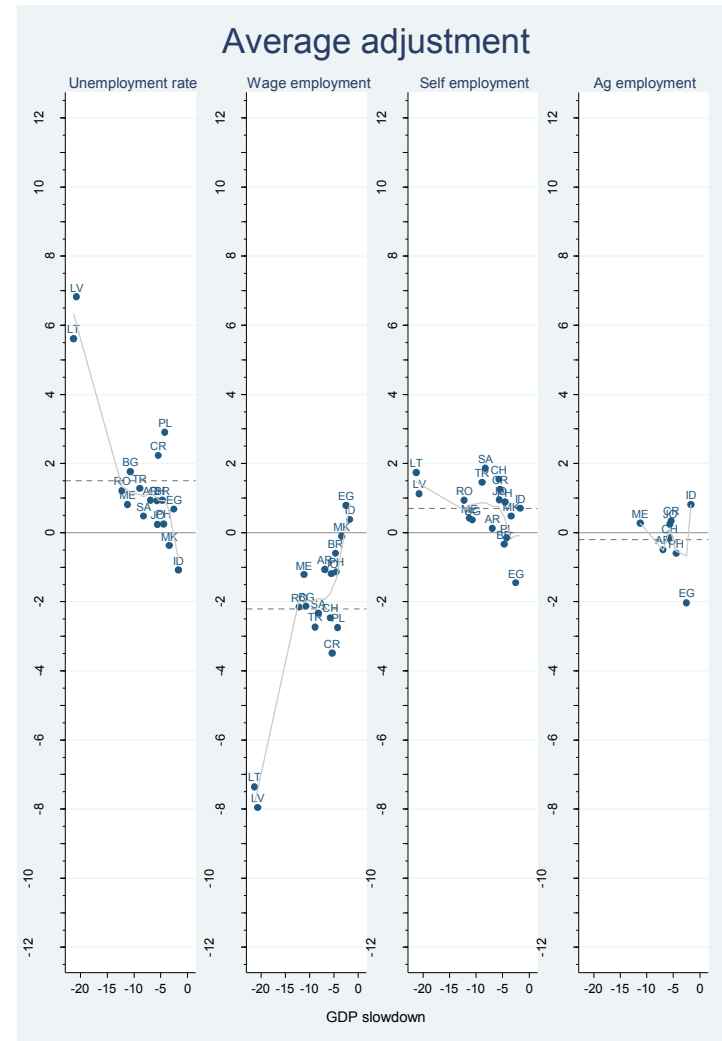| Region	Country	Slowdown in GDP growth	Source	Period	Frequency	Note
LAC	Argentina	-6.9	Household survey (EPH)	2006 Q4 - 2009 Q2	Quarterly	-Urban only -rotational panel -self employed and family worker combined
	Brazil	-4.7	Monthly Survey of Employment (PME)	1/2006 - 8/2009	Monthly	-Urban only -Rotational panel -No agricultural sector
	Chile	-5.7	National survey of Employment (ENE)	2006 Q1 - 2009 Q3	Quarterly	-Urban only -No earnings info
	Costa Rica	-5.4	Multi –purpose Household survey (EHPM)	2006-2009	Annually	
	Mexico	-11.2	National Survey of Occupation and Employment (ENOE)	2007 Q1 - 2009 Q1	Quarterly	-Rotational panel
EAP	Indonesia	-1.7	Indonesian Labor force Survey (Sakernas)	Feb 2006 - Feb 2009	Biannually	-Earnings only for wage and salary workers
	Philippines	-4.5	Philippines Labor force Survey	2006 - 2009	Biannually	-Daily wage rate for earnings
MENA	Egypt	-2.5	Egyptian Labor Force Survey (ELFS)	2006-2009	Quarterly	-rotational panel
	Jordan	-5.6	Jordanian Employment and Unemployment Survey (JEUS)	2006-2009	Quarterly	
ECA	Bulgaria	-10.7	Eurostat	2006 - 2009	Annually	- Cell means by gender, education, and age reported by Eurostat - Urban/rural breakdown only available for selected outcomes - No earnings and hours information
	Latvia	-20.7				
	Lithuania	-21.3				
	Macedonia	-6.1				
	Poland	-4.2				
	Romania	-12.2				
	Turkey	-7.4				
AFR	South Africa	-8.2	Labor force Survey and Quarterly labor force survey	2006 - 2009	Biannually	-Earnings not available -urban/rural information not available

Note: Slowdown in GDP growth rate due to the recession is calculated as GDP growth rate in 2009 compared from the average GDP growth rates in 2007-2008. For detailed numbers, see Appendix Table A1.

Figure 1: Country adjustments: Employment indicators

**Figure 2: Country adjustments: Wage and agricultural share**
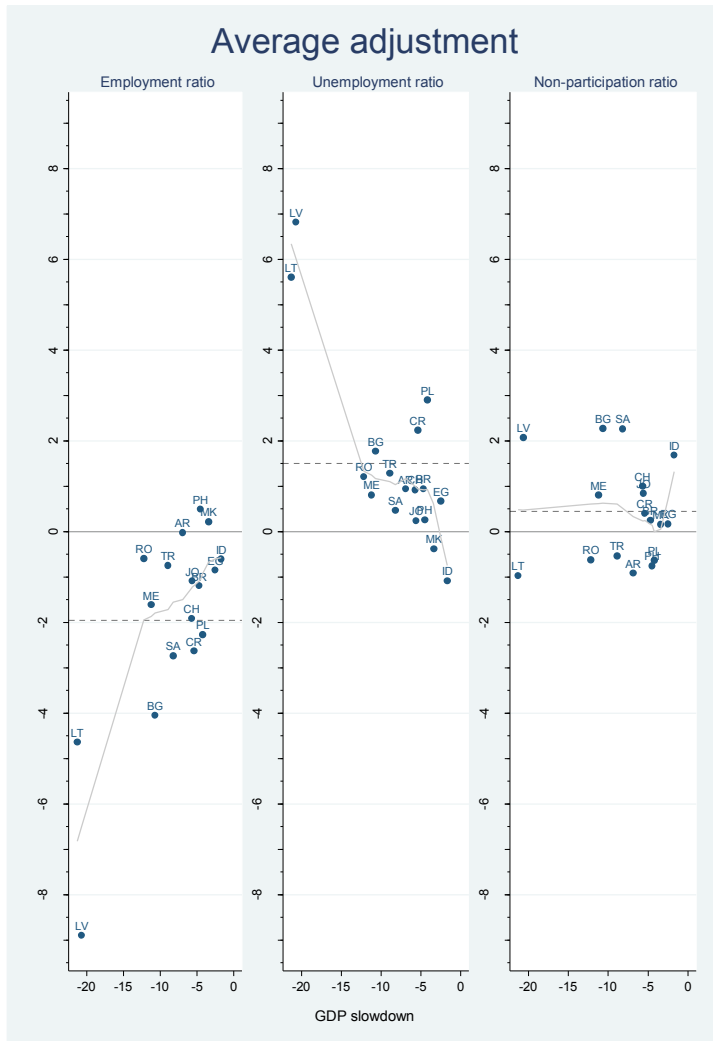
Note: The horizontal axis represents the slowdown in real GDP growth rate as defined in Table 1. The vertical axis is analogously defined as slowdown in the indicator. For example, the average yearly change in employment rate in Lithuania (LT) changes from 0.4 pct points (2006-2008) to -4.2 pct points in 2009, which plots the difference of -4.6 pct points. Two letter codes represent countries.
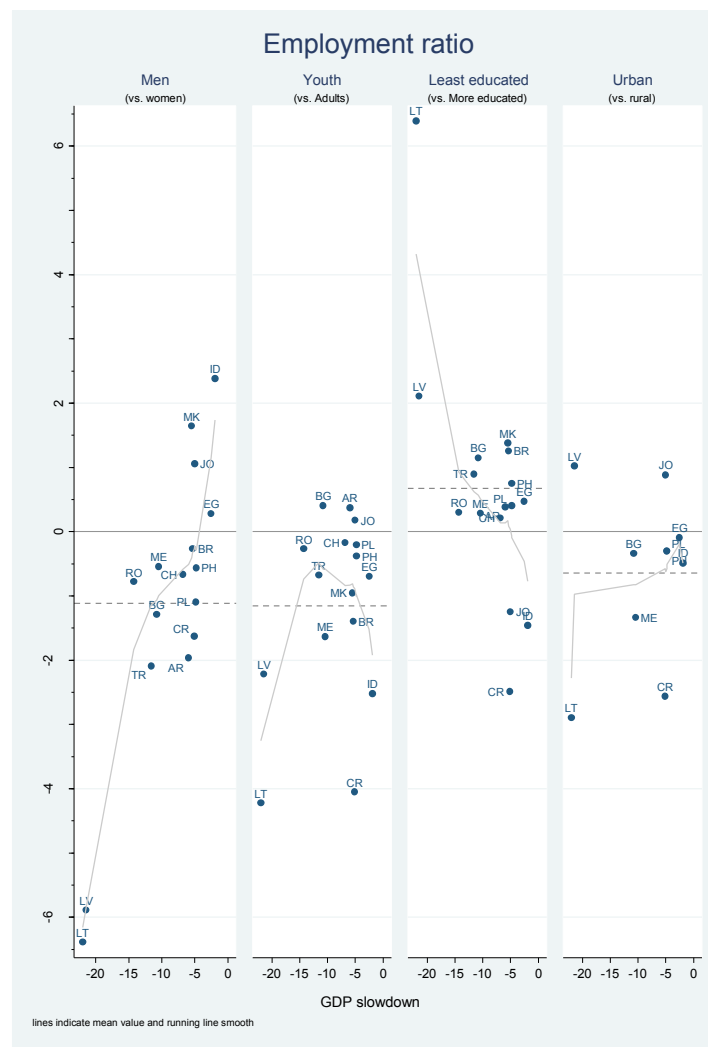
See note for figure 1. All four indicators are measured as a share of the active labor force. Self-employment includes self-employed and unpaid family workers.

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Figure 3: Country adjustments: Earnings, hours, and wages.
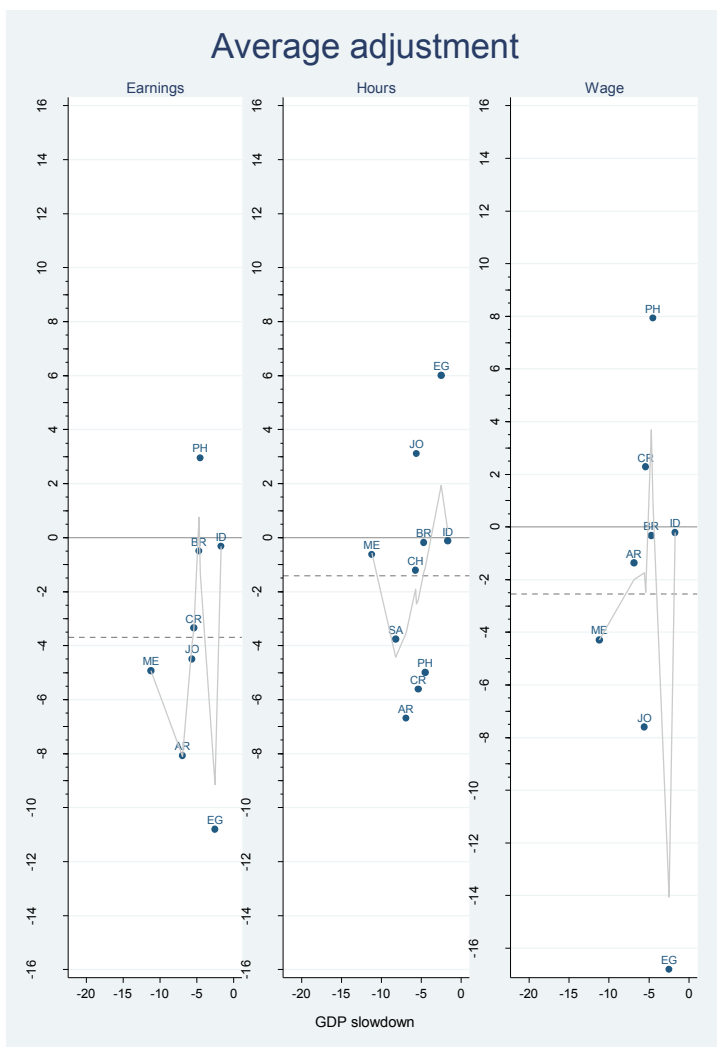
See note for figure 1

Figure 4: Employment ratio adjustment: group comparisons

Note: The figure shows the disparity between groups, controlling for other characteristics, in the slowdown in the employment to population ratio. The plotted number is the coefficient from regression for each country (equation (3) in Appendix C). The horizontal axis represents the slowdown in real GDP growth rate as defined in Table 1. Two letter codes represent countries.

Figure 5: Unemployment ratio adjustment: Group comparisons
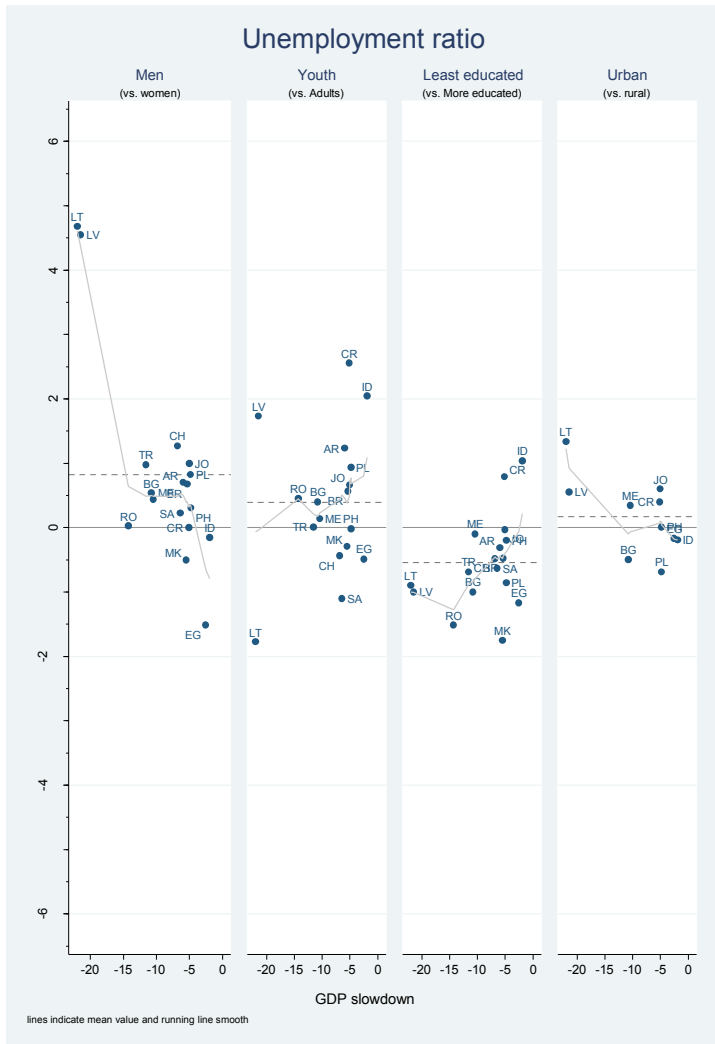
Figure 6: Non-participation ratio adjustment: group comparisons

See notes for figure 4.
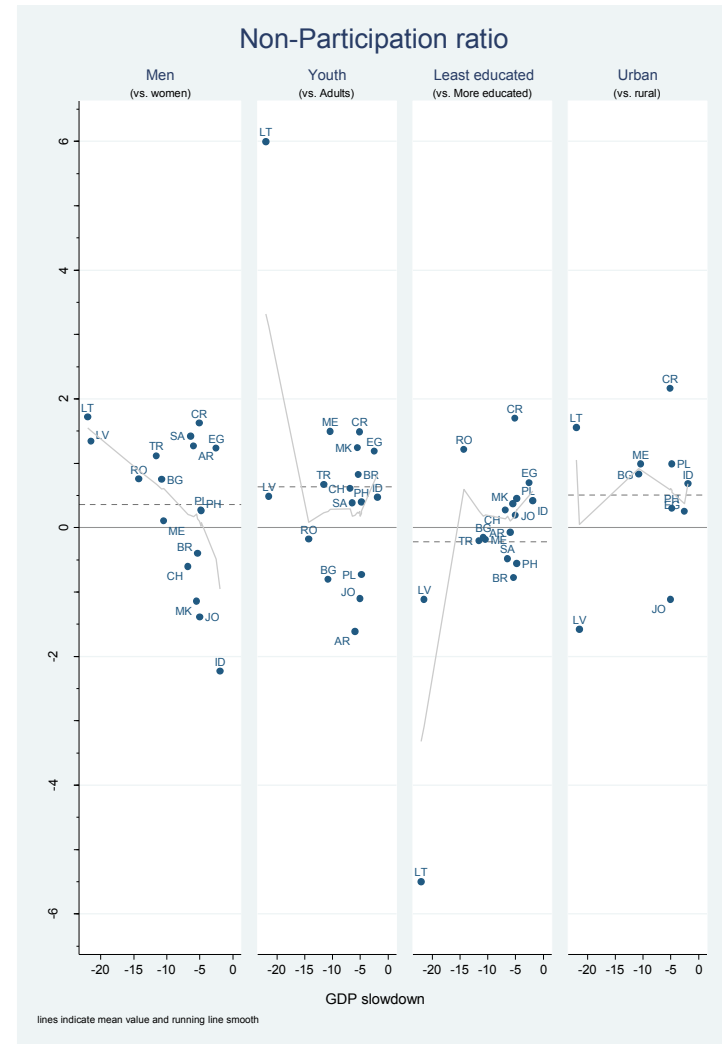
See notes for figure 4.

Figure 7: Unemployment rate adjustment: Group comparisons

See notes for figure 4.

Figure 8: Wage employment rate adjustment: group comparisons
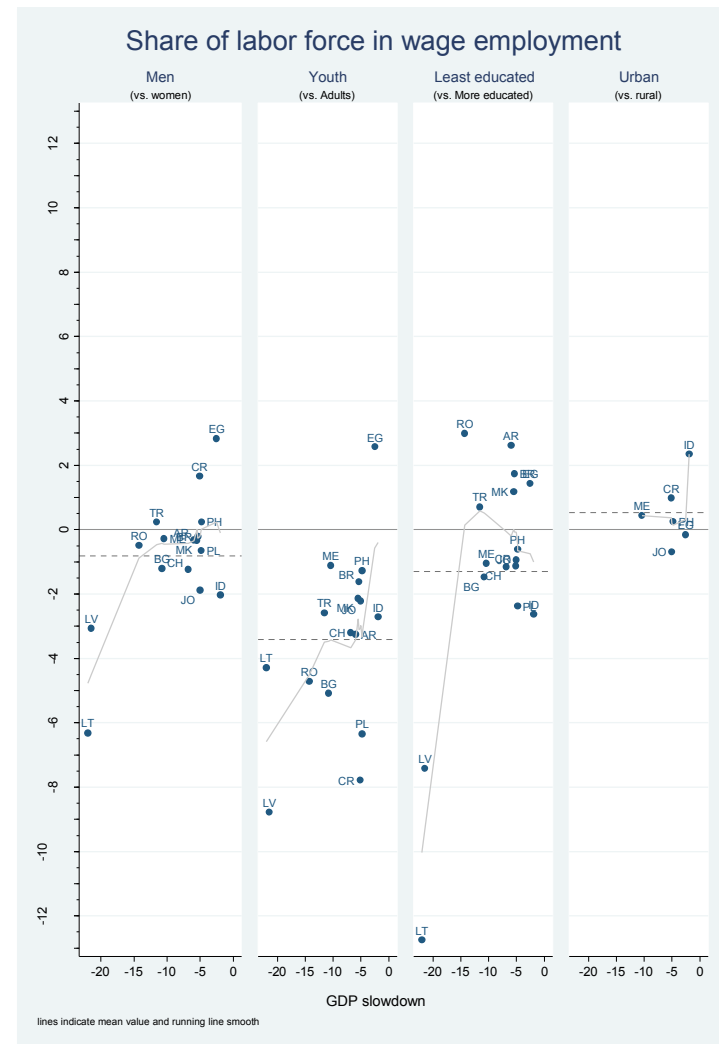
See notes for figure 4.

Figure 9: Self employment rate adjustment: Group comparisons

Figure 10: Agricultural rate adjustment: Group comparisons
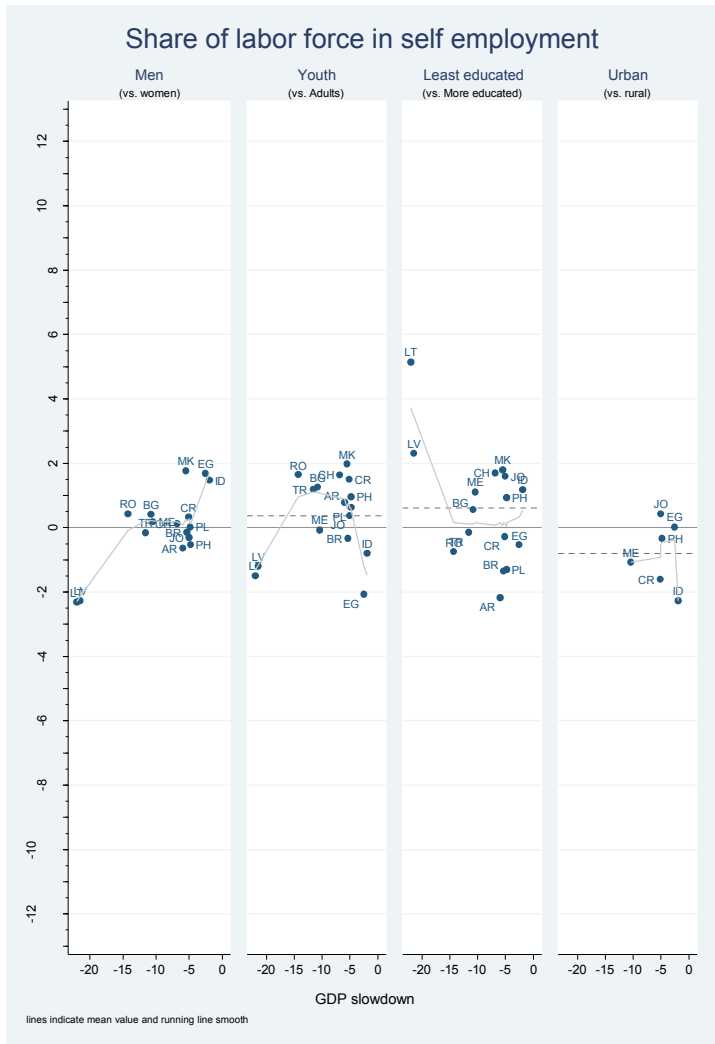
See notes for figure 4. Self-employment includes unpaid family workers.

See notes for figure 4.

25
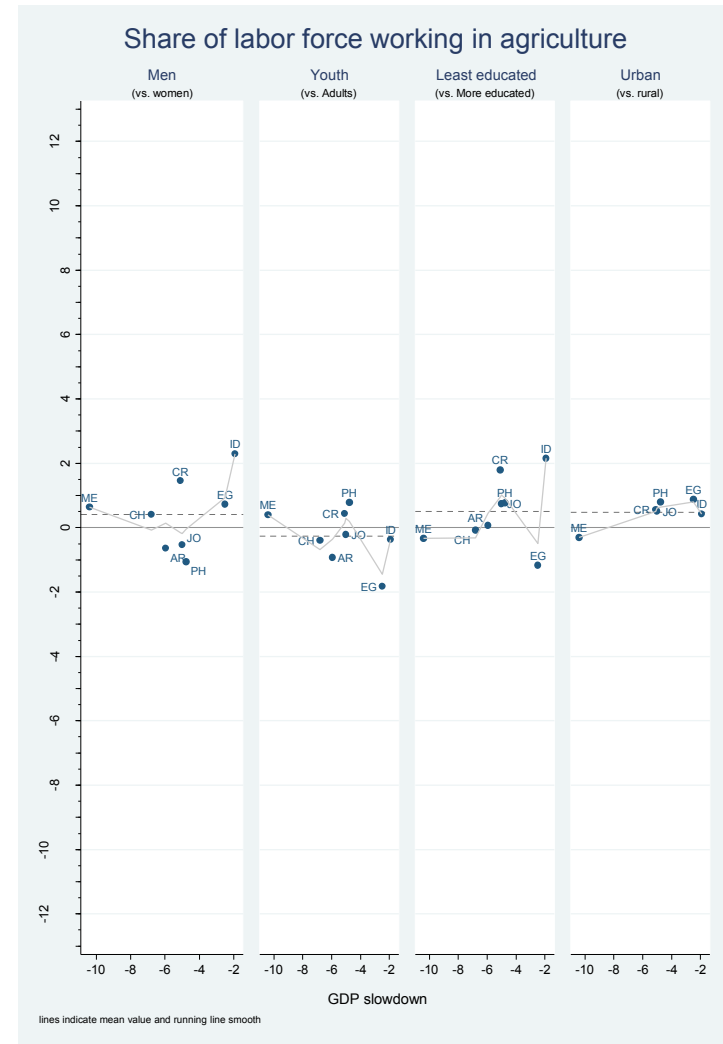
Figure 11: Wage adjustment: Group comparisons

Hourly wage

lines indicate mean value and running line smooth
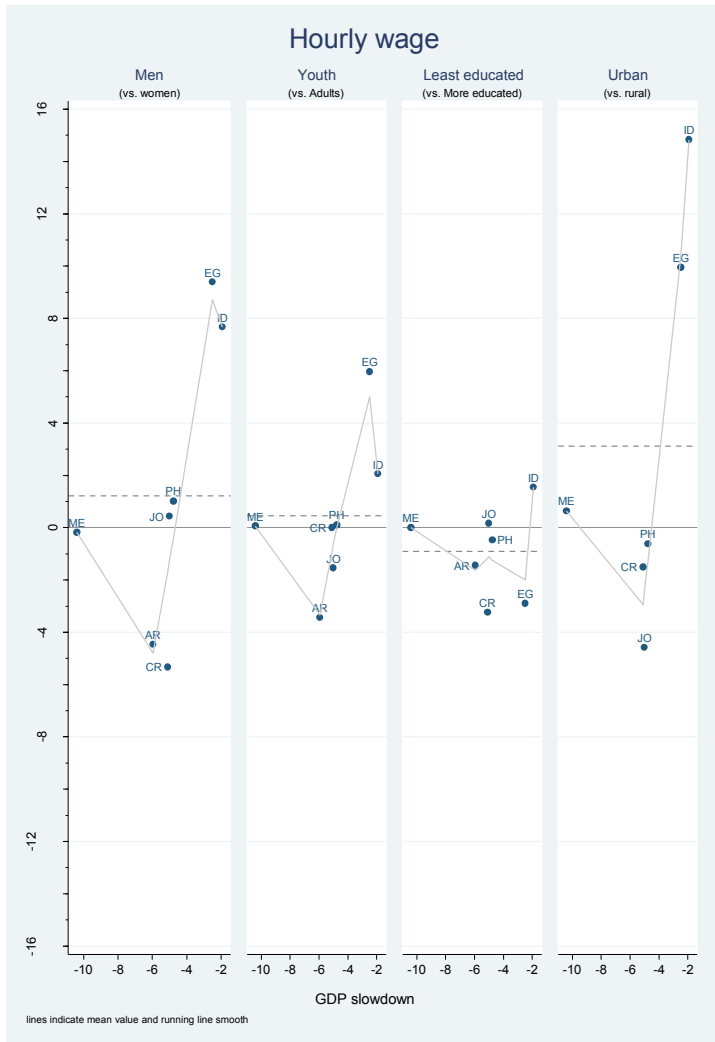
See notes for figure 4.

Figure 12: Hours adjustment: Group comparisons

Hours

lines indicate mean value and running line smooth
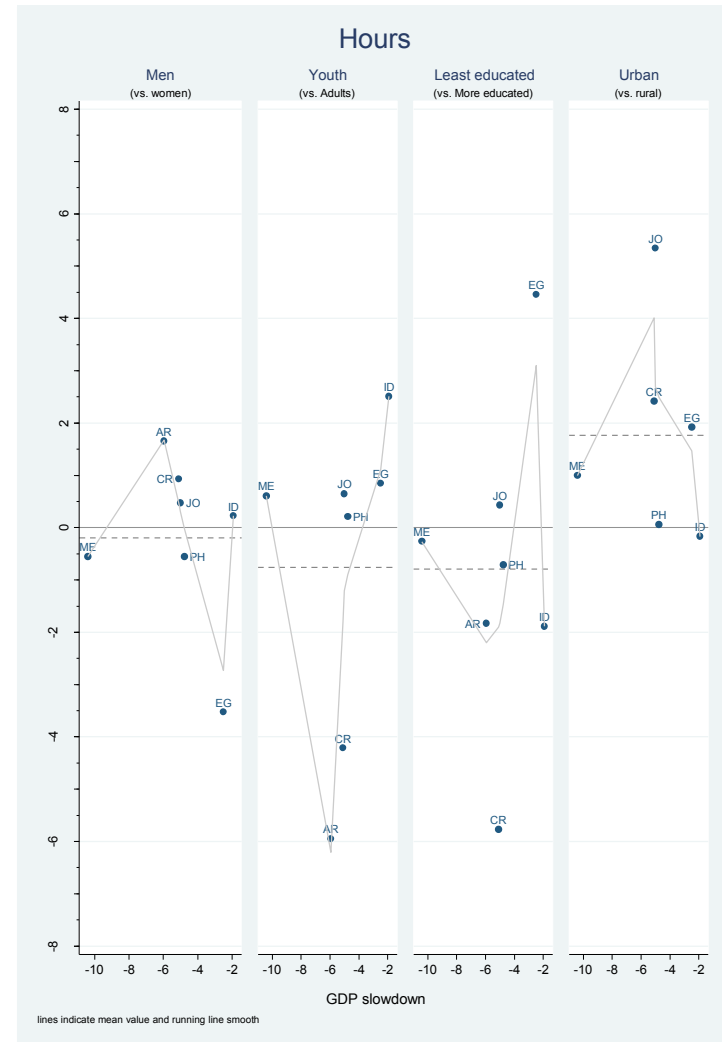
See notes for figure 4.

Figure 13: Earnings adjustment: Group comparisons

lines indicate mean value and running line smooth
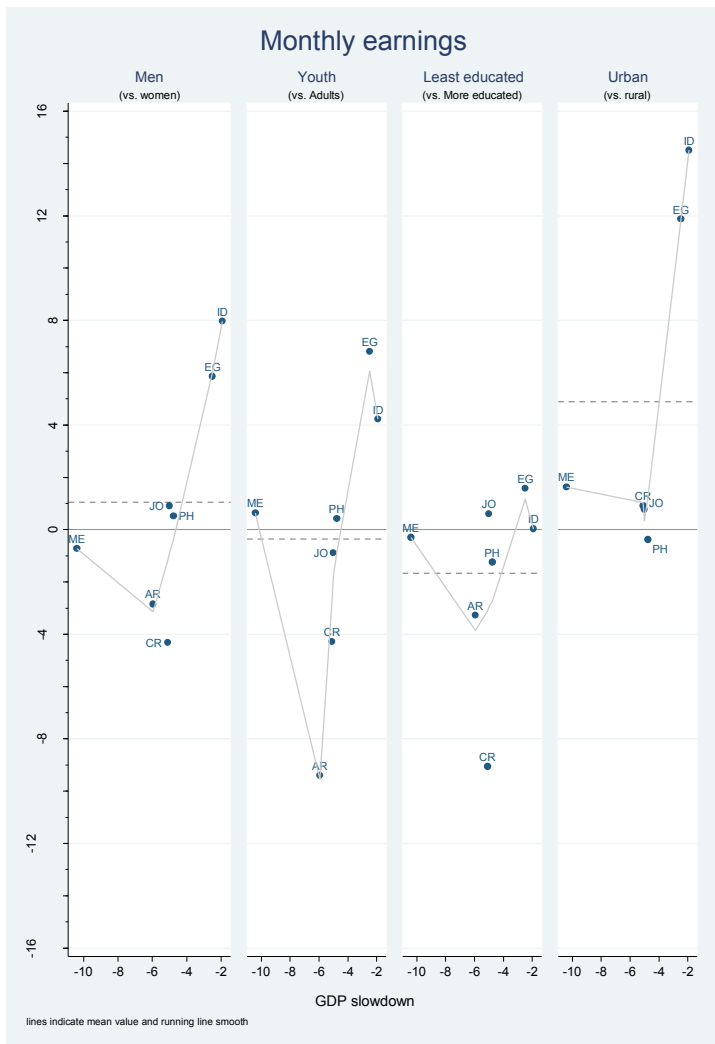
See notes for figure 4.

Appendix A. Labor Market Adjustment by Gender

Table A1. GDP growth rates and their slowdown

	Annual GDP Growth Rates			Average GDP growth rates		
	2007	2008	2009	2007-2008	2009	slowdown
Argentina	8.7	6.8	0.9	7.8	0.9	-6.9
Brazil	6.1	2.8	-0.2	4.5	-0.2	-4.7
Bulgaria	6.2	5.1	-5.0	5.7	-5.0	-10.7
Chile	4.6	3.7	-1.5	4.2	-1.5	-5.7
Costa Rica	7.9	0.7	-1.1	4.3	-1.1	-5.4
Egypt	7.1	7.2	4.7	7.1	4.7	-2.5
Indonesia	6.3	6.0	4.5	6.2	4.5	-1.7
Jordan	8.9	7.8	2.8	8.3	2.8	-5.6
Latvia	10.0	-4.6	-18.0	2.7	-18.0	-20.7
Lithuania	9.8	2.8	-15.0	6.3	-15.0	-21.3
Macedonia	5.9	4.8	-0.7	5.4	-0.7	-6.1
Mexico	3.3	6.0	-6.5	4.7	-6.5	-11.2
Philippines	7.1	3.8	0.9	5.5	0.9	-4.5
Poland	6.8	5.0	1.7	5.9	1.7	-4.2
Romania	6.3	3.8	-7.1	5.1	-7.1	-12.2
South Africa	5.5	7.3	-1.8	6.4	-1.8	-8.2
Turkey	4.7	0.7	-4.7	2.7	-4.7	-7.4

Source: World Economic Outlook Database

Table A2. Labor Market Adjustments by Gender

Region	country	Among Population						Among Active Labor Force						Among Workers							
		Employmenmt		Unemployment		Nonparticipation		Unemployment		Wage employment		Self Employment		Agriculture		Earnings		Hours		Wage Rates	
		Men	Women	Men	Women	Men	Women	Men	Women	Men	Women	Men	Women	Men	Women	Men	Women	Men	Women	Men	Women
	Argentina	-0.59	0.81	1.31	0.70	-0.72	-1.51	1.45	1.56	-1.29	-2.17	-0.17	0.61	-0.92	-0.06	-9.20	-5.67	-5.72	-7.39	-3.48	1.73
	Brazil	-1.65	-0.81	1.28	0.59	0.37	0.22	1.72	0.96	-1.14	-0.50	-0.57	-0.46	.	.	-0.99	-0.12	-0.18	-0.18	-0.81	0.06
LAC	Chile	-2.51	-1.47	1.57	0.34	0.94	1.13	2.36	1.17	-3.79	-2.76	1.42	1.59	-0.42	-0.49	.	.	-0.96	-1.44	.	.
	Costa Rica	-3.15	-1.37	2.25	2.17	0.90	-0.80	3.27	5.44	-4.53	-6.28	1.26	0.85	0.55	-1.52	-5.27	-2.20	-6.25	-7.43	0.98	5.23
	Mexico	-1.95	-1.24	1.09	0.56	0.86	0.68	1.53	1.31	-1.70	-1.43	0.17	0.12	0.42	-0.45	-5.24	-4.54	-0.91	-0.30	-4.33	-4.24
EAP	Indonesia	0.71	-1.75	-1.25	-1.05	0.54	2.80	-1.04	-1.48	-0.46	1.30	1.49	0.17	1.81	-0.45	3.33	-4.47	0.14	-0.35	3.19	-4.12
	Philippines	0.14	0.90	0.33	0.15	-0.48	-1.06	0.39	-0.06	-1.18	-0.88	0.79	0.94	-0.79	-0.03	3.63	2.12	-5.07	-4.95	3.63	2.12
MENA	Egypt	-0.74	-0.93	0.02	1.44	0.73	-0.51	0.14	5.11	1.18	1.32	-1.32	-6.42	-2.13	-6.00	-8.64	-13.25	3.11	8.79	-11.75	-22.04
	Jordan	-0.03	-0.39	0.36	-0.03	-0.33	0.43	0.26	0.30	-0.95	-0.35	0.69	0.06	0.12	0.00	-2.83	-4.12	3.37	2.56	-6.20	-6.68
	Bulgaria	-4.68	-3.40	2.02	1.48	2.66	1.92	3.19	4.08	-3.54	-4.00	0.36	-0.08	.	.	.	.	.	.	.	.
	Latvia	-12.24	-6.46	9.14	4.63	3.10	1.83	14.14	8.69	-14.15	-10.52	0.01	1.83	.	.	.	.	.	.	.	.
	Lithuania	-7.86	-1.63	7.98	3.38	-0.11	-1.75	12.29	5.52	-12.63	-7.65	0.34	2.13	.	.	.	.	.	.	.	.
ECA	Macedonia	0.60	-0.88	-0.56	-0.26	-0.03	1.14	-0.90	0.70	-1.07	-0.81	1.97	0.11	.	.	.	.	.	.	.	.
	Poland	-2.94	-1.85	3.30	2.47	-0.36	-0.63	5.40	4.72	-5.02	-4.19	-0.39	-0.52	.	.	.	.	.	.	.	.
	Romania	-0.85	-0.05	1.28	1.15	-0.43	-1.10	1.75	1.73	-2.54	-1.71	0.79	-0.01	.	.	.	.	.	.	.	.
	Turkey	-1.79	0.39	1.83	0.78	-0.04	-1.17	2.56	2.41	-2.92	-3.19	0.36	0.78	.	.	.	.	.	.	.	.
AFR	South Africa	-3.83	-2.21	0.56	0.37	3.27	1.83	2.57	2.42	-4.70	-3.87	2.13	1.45					-4.41	-2.81		

Notes: The difference between the annual percentage point change in 2009 and the average annual change between 2006 and 2008 for each outcome by gender is presented.

Appendix B. Technical Note

Our analysis is based on the estimated coefficients from descriptive regressions of year on year outcome changes on worker characteristics for each outcome of interest. Each regression is conditioned on four worker characteristics: their gender, age group – a youth (15 to 24) or adult (25 to 64), education group – least educated or better educated, and urban or rural residence.[30]

(1) $\quad \Delta Y_{i,t} = \alpha + \beta_{1,t} Men_i + \beta_{2,t} Age_i + \beta_{3,t} Educ_i + \beta_{4,t} Rural_i + \upsilon_{i,t}$

where $\Delta Y_{i,t}$ is an average year on year change in labor market outcome for a cell i and time t in each country. When annual data is used and t=2008, $\Delta Y_{i,2008} = Y_{i,2008} - Y_{i,2007}$. If quarterly data is used, then

we use average year on year change, and t=2008, $\Delta Y_{i,2008} = (\sum_{q=1}^{4} Y_{i,2008,q} - Y_{i,2007,q})/4$.

In order to estimate how the great recession changes the effect of each worker characteristics on the trend of outcomes, we estimate the following equation pooling all periods for each country:

(2) $\quad \begin{aligned} \Delta Y_i &= \tilde{\alpha} + \tilde{\beta}_1 Men_i + \tilde{\beta}_2 Age_i + \tilde{\beta}_3 Educ_i + \tilde{\beta}_4 Rural_i \\ &\quad + I(Crisis = 1) \times (\gamma_1 Men_i + \gamma_2 Age_i + \gamma_3 Educ_i + \gamma_4 Rural_i) + \tilde{\upsilon}_i \end{aligned}$

where $I(Crisis = 1)$ indicates the experience of recession, that is $t \geq 2009$. Each γ is our coefficient of interest that reflects the change of the relationship between worker characteristics and outcomes. From figure 4-13, we plot all γ's for each country and labor market outcomes.

Given the linearity of the equations above, note that estimating γ's from the equation (2) is equivalent to the following equation

(3) $\quad \tilde{Y}_i = \gamma_0 + \gamma_1 Men_i + \gamma_2 Age_i + \gamma_3 Educ_i + \gamma_4 Rural_i + \tilde{\upsilon}_i$

where $\tilde{Y}_i = \overline{\Delta Y_i} \mid (crisis = 1) - \overline{\Delta Y_i} \mid (crisis = 0)$. Note that $\overline{\Delta Y_i} \mid (crisis = 1)$ is an average of ΔY_i over $t \geq 2009$ and $\overline{\Delta Y_i} \mid (crisis = 0)$ is an average of ΔY_i over $t \leq 2008$.

Observations are weighted according to the product of the cell's survey weights and the number of observations used to generate the average, when available.[31] The outcomes are the ratio of the

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[30] Relatively well educated workers are those who graduated from junior secondary or above, except in Eastern European countries. In these countries, the vast majority of workers attended junior high school. Therefore, well educated workers are those that graduated from high school or college.

[31] Weighting by the number of unweighted observations corrects for heteroscedasticity in the dependent variable, which is a cell mean. In countries where the number of unweighted observations is unavailable, we assume they are proportional to the group's population proportion.

employed, unemployed, and non-participants among population, the proportion of unemployed, wage employed, and self employed among the labor force, and hourly wage, hours of work, and monthly earnings for the employed.

We repeat the same exercise of estimation separately by gender, assuming that the effects of demographic characteristics on outcomes may vary by gender. Based on the results for each country separately by gender, Table B2 presents the median of each γ's.

Table B2. Median coefficients of regression for each outcome: by gender.

Outcomes	Men			Women		
	Youth (vs. adults)	Least Educated (vs. more educated)	Rural (vs. Urban)	Youth (vs. adults)	Least Educated (vs. more educated)	Rural (vs. Urban)
Employed/population	0.97	-0.48	0.10	1.06	-0.49	0.01
Unemployed/population	-0.16	0.38	0.10	-0.08	0.39	0.10
Nonparticipation/population	-0.70	-0.17	-0.26	-0.59	0.11	-0.06
Unemployed/Labor force	-1.94	-0.02	0.25	-1.75	0.06	0.25
Wage employed/Labor force	2.87	0.44	-0.52	2.77	1.22	-0.52
Self employed/Labor force	-0.44	-0.43	0.75	-0.33	-0.55	0.75
Agriculture/Labor force	-0.08	-0.25	-0.64	-0.14	-0.08	-0.64
Hourly Wage	-0.59	-0.25	0.66	-0.95	-0.25	0.66
Monthly Earnings	-0.12	-0.26	-1.10	-0.46	-0.01	-1.10
Hours of work	0.38	0.32	-1.47	0.08	0.88	-1.47

Note: The medians of the coefficients in separate regressions by gender for each outcome are presented.