The Surprisingly Limited Impact of the Thai Crisis on Labor, Including on Many Allegedly "More Vulnerable" Workers

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Abstract

For most Thais the most important manifestations of the financial crisis are through the labor market, the subject of this paper. Results include: (1) aggregate labor market impacts were fairly small; (2) some effects occurred only with lags of a year or more so that analysis focused only on the year subsequent to July 1997 misses some important aspects; (3) some recorded effects appear puzzling (e.g., growth rates in real wages in the year prior to the 1998 Labor Force Survey); and (4) those affected most negatively include young adults and migrants. But, in contrast to previous claims, older adults, those residing outside of the Bangkok metropolitan area, females and perhaps those with low schooling, tended to fare as well or better than others. These findings raise some important questions about the extent to which some of these groups were particularly vulnerable to the crisis and, thus, what might be desired policy responses.

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Thailand was the first of the Asian developing economies to experience the financial crisis of the second half of the 1990s. In 1997 speculation on currency devaluation intensified, official foreign reserves were rapidly depleted, the currency subsequently was allowed to float and devalued considerably, over half of the finance companies (56 out of 91) were closed, the annual growth rate in real GDP per capita declined to -2.3% in 1997 and to -10.4% for 1998 from 4.5% for 1996 and from an average of 7.2% for 1990-5, and real GDP per capita relative to the underlying secular growth trend for the 1990s fell compared to the peak in 1996 by -5.2% in 1997, -20.2% in 1998, and -20.5% in 1999.[1] For most Thais the most important manifestations of the financial crisis presumably are through the labor market because the most important earning assets of most Thais -- particularly for the poorer members of society -- are their labor. The unemployment rate (for February or Round 1 survey) was fairly stable for 1995-7 (2.3%, 2.0%, 2.2%) but then more than doubled in 1998 (4.6% or 1.48 million people) and further increased in 1999 (5.2% or 1.64 million people).

But the aggregate unemployment rate may only tell part of the story regarding the labor market and related impact of the crises. Employment/unemployment status in the Thai labor force data is defined by whether one worked at least one hour for payment or as unpaid family worker in the survey week or had a regular job in which one was not working temporarily. There may have been important effects beyond unemployment per se on labor force participation and, for those employed, on the mean and dispersion of hours worked and the extent to which hours worked are low ("underemployment"), the mean and dispersion of wages and the extent to which wages are at low levels, work status regarding type of employer, sector of employment, and extent of formal versus informal employment. For those unemployed, further, there may be effects on duration of looking-for-work.

There may have been a process of "downward bumping," for example, in which at the margin more-skilled and more-established workers accepted lower wage positions formerly held by lower-skilled and less-established workers, workers moved from the formal to the informal sector, many workers reduced their hours, and females were squeezed out of employment by males. The effects may have been small, for instance, for some relatively highly educated prime-age males in certain formal-sector occupations but much larger for low-educated youth or older persons who are on the fringes of the labor market or for women. Or, in the context of the present crisis, some of those who with the highest education and in the most modern occupations may have been most affected if there was not much "downward bumping." Workers in sectors that were most directly affected by the macro crisis, such as those that produce investment goods may have been affected disproportionately. Recent migrants to the Bangkok Metropolitan Area (BMA) may have been more vulnerable to the reduced labor market demands than long-time residents. All of these and other effects may have considerable impact on the distribution of earnings in general and on those in the lower tail of the earnings distribution in particular. All of these effects may vary considerably, moreover, among categories defined by age, sex, educational attainment, migration status, marital status and region

[1] The last estimates are based on the data for the 1990s in Table 8 below. They focus on how much real GDP per capita differs from the secular trend each year, and – because this secular trend is positive – incorporate the secular growth not realized in addition to any decline in measured real GDP per capita. Kakwani and Pothong (1998) construct a similar measure of the macro crisis and estimate it to be -19.2 and -24.8% of the pre-crisis secular trend extrapolated into 1998 for the first and third quarters of 1998.

and, among those working, sector and type of employment. Some groups actually may have gained while others experienced losses, details that are not revealed in the aggregate numbers. To understand fully the impact of the financial crisis on labor market outcomes, thus, it is critical to consider (a) the range of channels of possible effects and (b) variations of these effects on different persons categorized by characteristics such as age, sex, educational attainment, migration status, marital status and region and among those working, sector and type of employment Previous studies suggest that some of these groups were hit particularly hard by the macro crisis. For example, Knowles, Pernia and Racelis (1999) and Pongsapich and Brimble (1999) suggest that women, less educated, and the elderly workers are more negatively affected. Kakwani and Pothong (1999), in contrast, found that there was larger increase in the unemployment rate among males than females but also found that the less educated were more affected.

The objectives of this paper are to investigate the impact of the recent Thai financial crisis not only on unemployment, but on the range of labor market outcomes noted above: labor force participation, the mean and dispersion of hours worked and the extent to which hours worked are low ("underemployment"), the mean and dispersion of wages and the extent to which wages are at low levels, work status regarding type of employer, sector of employment, the extent of formal versus informal employment and, for those unemployed, further, the duration of looking-for-work. We place particular emphasis on what have been the effects on demographic/work experience/education groups that are thought to be particularly vulnerable to labor market shocks and relatively poor. We investigate, for example, whether the effects have been larger for females than for males, for recent migrants than for long-time residents, for those who are not currently married but divorced/widowed/separated, as well as for those residing outside of the BMA. We consider throughout, finally, whether there are seasonal differences in the effects. In particular are the differences between the February round of data collected in the dry season when agricultural activity is low and the August round of data when agricultural activity is high.[2]

[2] Our concerns partially overlap, therefore, those of other recent studies of the social and distributional impacts of the Thai crisis (e.g., Kakwani 1999, Kakwani and Pothong 1998, Kittiprapas 1999, and Pongsapich and Brimble 1999) but we focus more on the labor market outcomes and, as noted below, come to some different conclusions than some of these studies.

We organize this paper as follows. Section 1 introduces the basic data source used. Section 2 presents summaries of major labor force variables for 1995-9. Section 3 presents time patterns in unemployment and wages for groups that are thought to be particularly vulnerable to the labor market changes caused by the financial crisis -- those with low education, young and old, recent migrants, unmarried and in the BMA. Section 4 presents simple multivariate relations with labor market dependent variables and with age, sex, educational attainment, migration status, marital status, and region to see whether coefficient estimates differ significantly before and after the crisis. Section 5 concludes.

Section 1. Data and Time Patterns in Key Labor Market Variables in 1995-1999

Our basic data source is the Thai Labor Force Surveys (LFS) conducted by the National Statistical Office (NSO). This survey was initiated in 1963, with two rounds a year since 1971, a third round added in 1984, and a fourth round added in 1998. The current four survey rounds are I (February, dry season), II (May, rainy season), III (August, pre-harvest season), and IV (November, harvest season). Since 1994 the NSO has used expanded sample sizes with a stratified two-stage sampling design (with the BMA and 75 provinces as strata) in order to allow analysis at a fairly disaggregated level. The number of households surveyed in each round for 1990-1999 is given in Table 1. For 1990-1993 the sample size was a little less than 30,000 households. For 1994-1999, the sample size was more than doubled to a little more than 60,000 households in the two-stage sampling design noted. For 1997, for example, a total of 60,672 households were interviewed (3,000 in the BMA, 24,060 in other municipal areas, and 36,612 in non-municipal areas). The sample, thus, is sufficiently large to permit the disaggregations suggested above among types of labor market effects and how they may differ among persons categorized by age, sex, educational attainment, migration status, marital status and region.

We utilize in this paper the two survey rounds on which attention usually is focused on which data have been gathered since 1971: I (February, dry season) and III (August, pre-harvest season). These two rounds cover the low- and high-agricultural activity periods, between which overall labor conditions differ considerably because of differential agricultural activity. It is an empirical question that we investigate, however, whether the labor market changes due to the Thai financial crisis differ much between these two rounds. Because the direct impact of the crisis *a priori* would seem to have centered on urban activities, particularly in the BMA, there may not be much seasonal difference in these effects that are associated with agricultural seasons even though the agricultural sector is a large employer. On the other hand, as noted in the introduction, other studies claim that the impacts were greater outside of the BMA due to migration and spillover effects, so there may be important differences across the seasons and survey rounds.

We use the standard NSO definitions for most of our variables:

Employed persons: Persons age 13-60 "who during the survey week (1) worked at least one hour for wages, profits, dividends or other kind of payment, in kind; or (2) did not work at all but had regular jobs, business enterprises or farms from which they were temporarily absent because of illness or injury, vacation or holiday, strike or lockout, bad weather, off-season or other reasons, such as temporary closure of the work place, whether or not they were paid by their employers during their period of absence, provided that in the case of a temporary closure of the work place, the expectation was that it would be reopened within 30 days from the data of closure and they would be recalled to their former job; or (3) worked for at least one hour without pay in business enterprises or on farms owned or operated by households heads or members."

Unemployed persons: Persons, 13-60 years of age, "who during the survey week did not work even for one hour, had no jobs, business enterprises, or farms of their own, from which they were temporarily absent, but were available for work. Persons in this category include:

1. those who had been looking for work, during the preceding 30 days,
2. those who had not been looking for work because of illness or belief that no suitable work was available, waiting to take up a new job, waiting for agricultural season or other reasons."

Current labor force: All persons 13-60 years of age "who, during the survey week were either employed or unemployed as defined above."

Seasonally inactive labor force: Persons 13-60 years of age, "who during the survey week were neither employed nor unemployed as defined above, but were waiting for the appropriate season, being person who usually worked without pay on farms, or in business enterprises engaged in seasonal activities owned or operated by the head of the household or any other member of the household."

Total labor force: All persons 13-60 years of age, "who during the survey week, were in the current labor force as defined above or were classified as seasonally inactive labor force as defined above."

Hours worked: "Hours worked mean hours actually worked during the survey week. For a person holding more than one job, his [her] hours worked would be the sum total of hours worked on all jobs. For a person who had a regular job but was not at work during the survey week, the number of hours normally worked in a week is taken as the hours worked."

Wage or salary: "Wages or salaries mean basic wages or salaries payable for the specified time or piece of work, not including overtime payments, bonuses or other fringe payments."

Duration of looking for work: "Duration of looking for work is the length of time during which an unemployed person had been looking for work. It is counted from the day he [she] started looking for work to the end of the survey week."

Work status: Work status is classified under five different categories: "employer, government employee, private employee, own-account worker, and unpaid family worker."

Migrant: Persons 13-60 years of age "who had changed their places of residence from one village or municipal areas to another village or municipal areas within five years preceding the last day of the survey week. Changes [in] the place of residence within the Bangkok Metropolis Area are not considered migration."

We also use some variables that we construct from the LFS data:

Real wage rates: We calculate wage rates per hour by dividing wages or salaries by hours worked and deflating by the regional CPI.[3]

Educational attainment: We aggregate the 11 categories for educational attainment used for the LFS into seven categories: no schooling, less than primary, lower elementary, upper elementary, some secondary, upper secondary and vocational, and university (including teacher training).[4]

Formal sector employment: We follow Sussangkarn (1987) and define formal sector employment to be working as public employees (including in state enterprises), for private employers that have more than ten employees or in selected occupations (e.g., lawyers, medical doctors, executives) even if there are ten or fewer employees.

Underemployment: We define underemployment to be a dichotomous variable for working less than 20 hours per week.

Not low wage (real wage above 20th percentile in 1995): We define this variable to be a dichotomous variable for receiving a real wage above the 20th percentile in 1995. We benchmark what we mean by a low wage by using the 1995 distribution because that was the last complete year of sustained high economic growth.

Unmarried: We combine divorced, widowed and separated into an "unmarried" marital status. Single (or never married) is not included in this variable.

Section 2. Time Patterns in Key Labor Market Variables in 1995-1999

We here consider the patterns in key labor force statistics for 1995-9. We start with 1995 because it is the last year during which the GDP real per capita growth rate exceeded 5.0% (as noted above, it averaged 7.2% for 1990-5, with a range from 6.7 to

[3] Real wages are nominal wages deflated by regional CPI indices.

[4] We also created a continuous indicator of grades of school completed with zero for those who have never attended school, two for those who have completed less than Pratom 4, four for those who have completed Pratom 4 or higher but not upper elementary, six for those who have completed Pratom 6 or higher but not lower secondary, nine for those who have completed Matayomsuksa 3 or higher but not upper secondary, 12 for those who have completed Matayomsuksa 5 or higher but not college or university and for those who have completed lower secondary and then a three–year vocational or technical level, and 16 for those who completed university or teacher college. Our initial empirical explorations, however, suggested that the relations between schooling attainment and labor market outcomes are sufficiently nonlinear that we report only those results in which schooling is represented by the categories given in the text.

7.6% and a value of 7.6% for 1995). We continue through 1999 round I because these are the last data released at the time that this project was initiated.

We have summarized these data in a number of tables and figures.[5] In what follows we refer to the particular tables and figures that are sources for the verbal summary in the text in parentheses. We also summarize the annual growth rates for some of the key variables that we discuss in Table 2. Finally we note that, though the crisis often is dated to have started with the devaluation in July 1997 and per capita real annual GDP is estimated to have declined in 1997, the LFS indicates fairly strong positive labor market conditions through round III in August 1997. Therefore the labor market impact of the crisis does not show up much in the LFS rounds I and III until 1998.

(1) Total Employment: Total employment peaked at 30.17 million (I) and 32.96 million (III) in 1997, fell by -2.7% (I) and by -2.3% (III) in 1998, but partially recovered by 2.0% (I) in 1999. The drop was somewhat larger for females than for males between 1997 and 1998 (-2.8 vs. -2.7% in I, -3.05% vs. -1.7% in III), but the recovery was greater for females than for males between 1998 and 1999 (2.9 vs. 1.3%). For females in I, the drop between 1997 and 1998 was 357,000 but with recovery in 1999 to 8,772 above the 1997 level. For males the drop was 459,000 between 1997 and 1998, and the 1999 level was 225,000 below the 1997 level. Thus the employment impact in I seems to have been about the same in 1998 for females and males but relatively larger for males in 1999, in contrast to frequent speculations about females being more marginal employees. But in III, the decline in 1998 indeed was larger for females. The difference between I and III suggests that agricultural changes in employment favored males relative to females.

(2) Employment by Sectors: Construction had the largest decline in employment, with manufacturing a distant second. Construction employment in round I peaked in 1996 at 3,114,000 and declined from that peak by 135,000 in 1997, 1,079,000 in 1998, and by 1,562,000 in 1999 (so that employment was cut in half between 1996 and 1999). While there were larger relative declines in employment for females (the 1999-I level was only 37% of the 1996-I level) than for males (the 1999-I level was 53% of the 1996-I level), because of the predominance of males in construction the absolute drop over this period was much larger for males (1,173,000) than for females (388,000).

Manufacturing employment in round I peaked in 1997, then fell by 72,000 in 1998 and to 142,000 below the 1997 level in 1999. For females, however, the peak was in 1998 (27,000 above the 1997 level), with a decline in 1999 to 85,000 below the 1998 level. For males the peak was in 1997, with a decline of 99,000 in 1998 and a slight recovery of 15,000 in 1999. For round III, in contrast, total employment in manufacturing decreased each year after 1995 to a level in 1998 that was -4.2% below that in 1995. For this round females had a large drop of -4.8% between 1995 and 1996 – before the crisis of 1997 and relatively small changes thereafter. Males, in contrast, had an increase of 2.9% between 1995 and 1996, but decreases of -2.3% and -3.7% for the first two years of the financial crisis. For round III (with more ambiguity for round I), thus, it appears that in

[5] These tables are available upon request from either the authors or ICSEAD. These tables give the numbers for different key labor force variables and, in most cases, the percentage composition and the percentage annual growth rates. These tables and figures give values separately for rounds I and III and for females and males. Figures derived from data tables tabulated from the Labor Force Surveys are also available upon request from either the authors or ICSEAD.

terms of manufacturing employment as for construction employment in both rounds males were affected more by the crisis than females.

Agriculture, services and other sectors all had increases in employment between 1997-I and 1999-I, but not sufficiently large increases to offset the declines in construction and manufacturing. Agricultural employment, after declining secularly for some time, increased significantly in 1999-I for both females (366,000) and males (539,000). Services increased by 330,000 between 1997-I and 1998-I and by a further 157,000 in 1999-I, with most of these increases for females (206,000 and 80,000, respectively). The remaining sectors increased by 136,000 in 1998-I and a further 82,000 in 1999-I, again more for females (101,000, 102,000) than for males (37,000, -20,000). For round III total agricultural employment increased 2.8% in 1997 after the crisis started (in contrast to the decline in round I before the crisis started in that year), apparently absorbing some of the labor that became available from the declines in manufacturing and construction. Both females and males increased employment in 1997-III by about the same percentages (2.9%, 2.7%), but males showed a further larger increase by 1998-III (4.1%) in contrast to a sharp fall for females (–5.6%). The relatively large increase in employment of males in agriculture in 1998-III partially offset the relatively large increases (or smaller decreases) for females in most other sectors.

(3) Formal/Informal Employment: The informal sector is often thought to be a residual sector that secularly declines with development but which acts as a employment buffer with counter cyclical fluctuations. Informal employment in fact declined from 69.3% of total employment in 1996-I to about 68% in the next two years to 66.4% in 1998-I but with a resurgence to 68.6% in 1999-I. The share of female employment in the informal sector was slightly (0.6 to 4.6%) higher than the share of male employment in the informal sector, with similar short-run fluctuations but with some tendency towards convergence. The share of informal employment in total employment in round III was a little over 5% higher than in round I for 1995-7 and but increased to 6.8% higher in 1998. That informal sector employment is higher in round III than in round I reflects the predominance of family farms in agricultural employment and that round III is during a more active agricultural season than round I. For round III the downward secular trends and the pattern of fluctuations appear similar to those for round I except that the share of male employment in the informal sector increased to 72.4% in 1998-III. The informal sector, thus, apparently did serve to provide some residual employment during the financial crisis, with its secular decline in the share of employment arrested and reversed, somewhat more for males than females. But this occurred with a lag. Employment in the formal sector increased by 2.6% in 1998-I, with almost all of this increase due to females (7.4%) and then declined in 1998-III (-2.4%) and in 1999-I (-4.8%), with larger declines for males in both cases.

(4) Labor Force Participation Rates: LFP rates for round I declined from the peak of 70.1% in 1996 to 69.2% in 1997 and 68.5% in 1998, with a slight increase to 68.9% in 1999. The declines between 1996 and 1997/8 were largely due to females and the increase between 1998 and 1999 was due entirely to females. For round III the biggest drop was in 1996, with that for females (-3.2%) more than twice as large as for males (-1.4%). Between 1996 and 1997 the LFP rate actually increased slightly, due to a 0.9% rise for females that more than offset a -0.2% decline for males. Between 1997 and 1998 the LFP rate then declined by -1.5%, again with the decline for females of -2.4% much larger than the decline for males. Thus the LFP rates in round I seemed to respond

negatively initially to the financial crisis and then start to recover by early 1999, with larger changes for females than for males which is consistent with females being more marginal workers in the labor force. During round III with the greater agricultural activity, however, changes in LFP seemed to be dominated by agricultural conditions so the patterns differ, but those for females continue to be much larger than those for males. For both rounds, thus, even though the LFP participation rates for females are from 17.3 to 18.2% lower for males in round I and from 13.7 to 15.0% lower in round III, it is the changes in female LFP that dominate the overall changes because females are much more likely to be close to the margin regarding whether or not to participate in the labor force.[6]

(5) Unemployment Rates: The unemployment rate for round I increased from a trough of 2.0% in 1996 to 2.2% in 1997 to 4.6% in 1998 to 5.2% in 1999. While there apparently was a substantial increase in the unemployment rate associated with the financial crisis, it did not become really high in comparison with rates reported for a number of other countries. The rates for females were about 0.5 or 0.6% higher than those for males except in 1998 when they were slightly lower than for males. The unemployment rate for round III persistently was about 1.0% lower than that for round I, reflecting the importance of the increased seasonal agricultural demand: 1.1% in 1995 and 1996, 0.9% in 1997, and 3.4% in 1998. Note that for 1997, the round I rate increased a little from the previous year and the round III rate decreased a little from the previous year even though the April date that often is used to represent the start of the crisis was between these two rounds. This reflects again that the 1997 agricultural year apparently had relatively strong labor demands independent of the crisis. The round III rates for females exceeded those for males slightly in 1995 and 1996, but were the same as for males in 1997 and 1998.

(6) Percentage of Workers Working Less than 20 Hours a Week -- Underemployment Rate: In addition to effects on labor force participation and on the unemployment rate, the crisis may have reduced the hours worked of those employed. Of particularly interest may be the effects on those who are working relatively few hours, as is measured by traditional indicators of underemployment. Here we use the unemployment rate to represent the proportion of employed who are working less than 20 hours per week. The underemployment rate in round I fell from 2.1% in 1996 to 1.8% in 1997 and then increased to 5.0% in 1998 and declined to 2.9% in 1999. Thus there was a relatively large increase in the first year after the crisis started, though substantial recovery in the next year. The underemployment rate in round III increased from 1.8% in 1996 to 2.2% in 1997 to 2.9% in 1998. The increase in 1997 for round III contrasts with the fall for round I, probably reflecting the timing of the rounds relative to April 1997. For both rounds the annual changes were relatively larger for females than for males, and in every year the rates are a little higher for females than males. These differences by gender are consistent with females being more marginal workers than males.

(7) Number of Days Looking for Work for Unemployed: The mean and standard deviations of the time looking for work in round I fell substantially between 1996 and 1997, increased some between 1997 and 1998 and then much more in 1999 (though still to only a little above the 1996 levels). The declines between 1996 and 1997, which are

[6] That the gap between female and male LFP rates is systematically less in round III when agricultural activity is much higher than in round I also reflects that females tend to be more at the margin of labor force participation.

somewhat surprising, reflect the high 1996 values for males. Females had increasing values each year between 1995 and 1999. The post-1997 increases were larger for males than for females. This gender difference is perhaps surprising given the usual characterization of females as being more weakly attached to the labor force than males, but seems consistent with the strong employment impact on males discussed above. For round III the means for both females and males increased each year from 1995 through 1998 and the standard deviations increased except between 1995 and 1996.

(8) Work Status of Employed Persons: The share of own-account and unpaid family workers among all workers tends to decline in the development process. In addition there are expected to be anticyclical fluctuations because this type of employment is alleged to serve as residual employment when other options lessen. For round I this share declined from 52.4% in 1995 to a trough of 50.7% in 1996, and then increased to 51.0% in 1997, 52.0% in 1998, and 54.1% in 1999. Because of the reduction of -2.7% in the total number of employed between 1997 and 1998, the increasing share in 1998 nevertheless (and perhaps somewhat surprisingly) implied a decline of 122,000 or -0.8% in the numbers in this work status between 1997 and 1998. Most of these changes were due to females – in fact males in this status increased by 183,000 or 2.2% between 1997 and 1998 but females fell by a larger amount. For round III these shares are significantly higher than for round I because many agricultural workers are in this work status. The round III share of own-account and unpaid family workers among all workers fell from 61.5% in 1995 to 59.8% in 1996 and then increased slightly to 60.0% in 1997 and to 61.0% in 1998. For males the share followed the same pattern while for females it followed a very similar pattern with the trough in 1997. Thus, for both females and males (more so the former in round I), own-account and unpaid family worker status appeared to be a residual status that absorbed some of the workers who would have been in paid sectors if it were not for the financial shock.

Private employees peaked in 1996 at 38.9% of the round I workers and 30.6% of round III workers and then fell slightly to 38.5% and 30.5% in 1997, fell more to 36.3% and 28.1% in 1998, and further to 34.1% in 1999-I. This implied a fairly substantial drop from 1,450,000 workers in this sector between 1996-I and 999-I. For females the peaks were in 1997 and the declines smaller than for males.

The number of employers and government employees increased every year since 1996 in both rounds. The largest increase was in 1998, with growth rates of 8.3% in round I and 12.3% in round III. This is the only work status at the tripartite level of aggregation that we consider for which positive growth was recorded for total employment in 1998 (though as noted above, among males that for own account worker and unpaid family worker increased in that year, but not as much as that for females declined). While employment in the employers and government employee work status increased considerably in percentage terms in 1998, because this work status is of relatively small importance in total employment (from 10.5 to 11.9% in round I during 1995-9 and from 9.5 to 10.9% in round III for 1995-8), the increases of 264,000 and 384,000 in employment in this sector in 1998 in the two rounds only offset about a quarter and a third, respectively, of the drops in private employee and own account worker and unpaid family worker status (which totaled -1,080,000 and -1,146,000, respectively, mostly in private employees status). Thus expansion of employment in this work status, perhaps in part through conscious governmental anti-crisis employment increases, did serve to alleviate some, but only a fraction, of the employment losses

elsewhere in the economy. The increases of employment in this work status in 1998 were considerable for both females and males, the growth rates were much larger – and the absolute increments somewhat larger – for females than for males.

(9) Employed Persons with Positive Own Wages: This number peaked in 1997 and then fell by -5.1 and -5.7%, respectively in the two rounds for 1998, and by another -3.7% round I for 1999. Because private employees constituted over 80% of those who received wages in 1997 (82.9 and 80.7%, respectively in the two rounds), the fairly large percentage drops in private employees receiving wages (-8.2 and -10.0%) more than offset larger percentage increases in governmental employees receiving wages in the same year (10.4 and 12.1%). There were definite gender differentials favoring female employment, with increases in female governmental employment that in percentage terms were much larger than for males and with declines in male private employment that were much larger in percentage terms for males than for females. For 1999-I, however, government employees receiving wages fell -1.2%. This still was much less than the -4.4% for private employees receiving wages, and still the changes in percentage terms favored females over males.

(10) Average Real Wage Rates: Round I average real wages increased slightly (2.2%) between 1995 and 1996 and then increased more between 1996 and 1997 (7.2%) and between 1997 and 1998 (8.0%) before declining between 1998 and 1999 (-8.5%). The increase for females and for males in the 1995-1998 period were not much different (20.1% versus18.0%), as were the declines between 1998 and 1999 (-7.7%, -8.9%) – though with males faring a little less well over this period in terms of percentage increases. The variations (standard deviations) in real wages tended to follow similar patterns, but with larger percentage changes. The round I real wage increases through 1998 apparently reflected selective job losses that were concentrated more among lower-wage workers. The impact of the real wage increases through 1998 on employee earnings were offset in part by reduced labor force participation (overall and in wage employment), reduced hours worked per week, and increased unemployment.

Round III real wages declined by -1.5% in 1996, increased by 24.0% in 1997, and declined by -14.7% in 1998. As a result the real wages in 1998 were 4.1% higher than those in 1995. The increase in 1997 again may have reflected selective job losses that were concentrated among lower-wage workers, perhaps reinforced by the apparent high labor demand in agriculture noted above. Another reason could be the lagged response in the labor market which appears to take more than a month or so to adjust as the exchange rate crisis took place at the start of July 1997 and the LFF 1997-III was conducted in August. But an increase of a quarter in real wages for these reasons between 1996-III and 1997-III seems too large and is a surprise. We do not see, moreover, that it is an artifact of the data though if the deflator that is used adjusted much more slowly to the devaluation of July 1997 than did wages and the prices that are actually relevant, this would contribute to the appearance of a real wage increase.

(10A) Average Real Wage Rates if Share of Wage Earners in Population Maintained at Pre-Crisis Levels: The discussion above on real wage patterns refers to real wages for those employed and receiving wages abstracts from the fact noted above in point (9) that the proportion of the work force receiving real wages declined subsequent to the macro shock. The post-shock increases in mean real wages noted in (10) may be in part, thus, that some employees who would have had positive real wages in the absence of

a shock instead had zero wages.[7] Here we consider alternative mean real wage calculations in which we assume (a) that the proportions of the population employed in jobs with wages are the same in subsequent years as in 1995, (b) those among the numbers who would have received wages under that assumption but who do not report positive wages are given zero wages for this calculation. This adjustment, of course, makes a difference only for years in which the numbers of individuals who actually received wages differed a lot from those who would have received wages had the 1995 proportions prevailed. For both rounds of 1998 and for 1999-I this adjustment makes a substantial difference: in 1998-I a 1.1% increase instead of 8.0% in (10) above, in 1998-III a decrease of -20.4% instead of -14.7% above, and in 1999-I a decrease of -13.6% instead of -8.5%. Between 1997 and 1998 and between 1998 and 1999 in round I, therefore, in this sense the real wage performance was less good/worse if account is taken of the reduced numbers of wage recipients. Note that this adjustment does not make a big difference in regard to the biggest surprise in the real wage data – the increase of about a quarter of the real wage in 1997-III – because the proportion of the population receiving wages in that round is not very different from that in 1995-III.

(11) Proportion of Workers with Real Wage above the 1995 First Quintile: If there were "bumping" down of jobs, with higher-skilled individuals replacing lower-skilled ones in lower-paying jobs or if wages for lower-paying jobs were particularly squeezed by the crisis, one might expect that the proportion of workers with real wages above the 1995 first quintile would have fallen (i.e., those with real wages below this cutoff would have increased). This might have happened even if the mean real wage increased, as discussed above. If, on the other hand, primarily previously low-wage workers lost their jobs, the whole distribution of real wages for those still working may have shifted to the right so that this proportion increased. In fact until the last observation for the two rounds, this proportion increased after 1995, though at a decreasing rate with peaks at 95.3% in 1998-I and at 92.6% in 1997-III. Thus the bottom end of the real wage distribution continued to move upward through 1998-I and declined but a little in 1998-III and 1999-I. These data are consistent with selective job loses concentrated at the lower end of the distribution in response to the financial crisis. The increases in the percentage above the bottom quintile in 1995 were particularly large for females, who began in 1995 with much smaller proportions above this cutoff (71.9%, 72.9%) than had males (85.1%, 85.0%) but subsequently had proportions above the reference level that increased more rapidly so that these proportions converged substantially by the last rounds of data that we cover with 89.8 and 89.9% for females and 93.0 and 94.4% for males. In this, as in a number of other respects noted above, thus females fared better relative to males after the macro shock.

(12) Average Hours Worked per Week: Real earnings are the product of real wages and hours worked. Earnings, therefore, may move in the same or opposite direction as real wages. Average hours worked per week peaked in 1995-III at 52.2 and in 1996-I at 51.4. They declined somewhat in the year prior to 1997-III (-1.2 hours) and more sharply in the year prior to 1998 (-2.9 hours), with the former smaller than the latter perhaps because 1997 was a good agricultural year, as noted above. For both rounds there was partial recovery in the next survey round (0.8 hours in 1998-III, 1.4 hours in 1999-I). The variation in hours worked increased fairly sharply in the same round in which the mean fell (1998) but declined somewhat in the next year for round I (but not

[7] Those who switched from positive wages to no wages still may have been engaged in productive nonwage activities. If so the calculation in the text in a sense overstates the productivity loss.

round III). Thus an important component of the reduction in household income of a number of households subsequent to the initiation of the crisis was a reduction in hours worked by those still employed, additional to reductions in labor force participation and increases in unemployment rates among those participating. The increased variation in hours worked, moreover, meant that these changes probably were accompanied by greater inequality. There has not been much difference in the patterns of changes for males and females.

(12A) Average Hours Worker per Week if Proportion of Population with Positive Hours of Work were the Same as in 1995: Parallel to the discussion in (10A) on real wages, we here consider what would have been the average hours if the same proportion of the population reported positive hours as in 1995 by including in this alternative calculation of hours worked values of zero for those who did not report positive hours worked but would have reported positive values if the proportion reporting such hours was maintained as in 1995. This alternative results in a larger drop in average hours particularly in 1998 – -5.0 rather than -2.9 hours in 1998-I and -1.1 rather than 0.8 hours in 1998-III.

Section 3. Time Patterns in 1995-1999 in Real Wages and Hours Worked for Selected Groups Thought Likely to be Most Vulnerable

Females are often thought to be more vulnerable than are males to macro shocks, including in some previous assessments of the Thai experience. Section 2 notes differences and similarities between a number of labor market variables for females versus males. On net these comparisons suggest that, contrary to such views, females tended, if anything, to fare better than males.

In this section we turn to comparisons for some other groups who often are thought to be particularly vulnerable to macro shocks: those with low schooling, those adults who are relatively young or relatively old, those who are migrants, those whose marital status is widowed/divorced/separated and those living outside of the BMA. To keep the presentation of a reasonable length we focus on two key variables for both round I and III: average real wage rates and average hours worked.[8] Tables 3-7 summarize the percentage changes in these two variables for 1995-9 for round I and for 1995-8 for round III. The question of interest is whether, subsequent to July 1997 starting in 1997-III and 1998-I, did the allegedly more vulnerable groups fare worse than the others?

Low schooling: Schooling is generally hypothesized to increase adjustment capacities so that, *ceteris paribus*, those with more schooling might be expected to be able to adjust more quickly to labor market changes (e.g., Welch 1970, Schultz 1975, Rosenzweig 1995). On the other hand, those with more schooling also may have invested more in job- or firm-specific human capital and thus lose more if labor market changes

[8] Two points are worth noting. (1) Though these variables are fairly central in most characterizations of labor force outcomes, focusing on them exclusively may miss some effects that are captured by other variables that are discussed in Section 2. (2) For workers receiving wages, these two variables are inter-related because the real wage rate is calculated by dividing real wages by hours worked. To the extent that there is measurement error in hours worked for wage recipients, this results in an inverse association between the two variables due to measurement error alone (and not necessarily related in any way to the inverse association along labor demand curves). Hours worked data also cover other workers who do not receive wages.

reduce the returns on such investments. Table 3 gives the growth rates in real wages and hours worked for workers with primary, secondary and university schooling. For round I those with primary and secondary schooling had small real wage increases between 1997 and 1998, but those with university education had a small decline. Between 1998 and 1999, all three groups experienced declines of at least -10%, with that for those with secondary schooling somewhat larger at -12.3%. The overall effect was that real wages decreased most in percentage terms between 1997 and 1999 for those with university education, and least for those with primary schooling. For round III all three groups recorded large increases between 1996 and 1997 and large declines between 1997 and 1998, with the magnitudes of the percentage changes in both directions increasing with the level of education. The cumulative effect between 1996 and 1998 increased the real wage of those with university education by 2.5% and reduced real wages for the other two groups by -3.5%.

For both rounds those with primary schooling had the smallest drop in hours worked in the first post-crisis report (1998-I, 1997-III), but also had the smallest increase in the next year. The cumulative effect for two years meant that those with primary schooling had greater percentage drops in hours worked than did those with university education (though with less volatility) but less than those with secondary schooling.

Thus, those with relatively low schooling did not appear to be strongly disadvantaged in regard to changes in real wages and hours worked associated with the financial crisis. If anything, they tended to experience less negative and less volatile changes than those with secondary or university education. Therefore, though those with more schooling may be more capable of adjustment, apparently any greater adjustment capability was more than outweighed by their relative concentration in jobs and sectors that were hit harder by the financial crisis. Presumably these were primarily in non-construction sectors because construction, which was hit particularly hard, is not dominated by workers with high schooling.

Young adults and older adults versus prime-age adults: Young adults and older adults are often thought to be more vulnerable to labor market shocks than are prime-age adults, both for supply and demand reasons. On the supply side, young adults are more likely to be searching for good job matches and considering further training and schooling, and older adults are more likely to be contemplating reduced hours worked and retirement. In addition, both young and older adults are less likely to have families to support than prime-age adults. On the demand side, young adults are not likely to have as much job-specific human capital and older adults are more likely to have deteriorating or obsolescent human capital. On the other hand older adults might benefit from having relatively great seniority on jobs and with employers. Table 4 summarizes the annual percentage changes in real wage rates and in hours worked for three age groups – young adults (20-24 years old), prime-age adults (25-49 years old) and older adults (age 50+). In terms of real wage changes, young adults tended to gain less during 1996-7 III and 1997-8 I and lose more in 1998-9 I and (at least relative to older adults) 1997-8 III. They also had relatively large percentage declines in hours worked in 1997-8 I and (at least relative to older adults) in 1996-7 III. The general tendency, thus, was for younger adults to be most affected by the shocks, with prime-age adults next (and in round III in some respects more affected than young adults). Older adults, in contrast, were least affected among these three age groups. Apparently for the 50+ age group the advantages of

seniority outweighed the factors that might make them relatively marginal participants in the labor force.

Migrants versus non-migrants: Migrants are defined as those who have moved into an area within the past five years. Migrants might have relatively great difficulty in finding jobs and be more vulnerable to being laid off because they tend to be more recently hired. On the other hand, migrants may be more dependent on jobs for supporting themselves because they have less established family and friend support networks, so they may search harder and work harder if employed. Moreover they may be more able to move elsewhere, particularly back to their origin, if job options are bad. Table 5 gives the percentage changes in real wages and in hours worked for migrants and nonmigrants. In terms of real wage rate changes migrants clearly fared less well on average, with smaller increases in 1996-7 III and 1997-8 I and larger decreases in the following year. They also experienced larger declines in hours worked in 1996-7 III and 1997-8 I, though they recovered somewhat more in the subsequent rounds. The factors that made migrants more vulnerable to macro shocks, thus, apparently predominated.

Marital status: Single workers may be more marginal in the labor force than married workers for both supply and demand reasons that are similar to those for younger workers. Unmarried workers – divorced, widowed and separated workers – also may be relatively marginal participants, in some cases, for example, having recently entered or re-entered the labor force because of the change in their marital status and in many cases being older. Table 6 gives the percentage changes in real wages and in hours worked by marital status. Singles had the greatest volatility in hours worked and in real wage rates for round III. The unmarried had the least volatile real wage and hours changes in round III, but the most volatile real wage changes in round I. Thus there do not appear to be strong patterns by marital status though the married group tended to experience less volatility than at least one of the other two groups for both variables for both rounds.

BMA versus all Thailand: The booming growth of the Thai economy in the 1980s and early 1990s was focused substantially in the BMA – many have argued, too focused. Between 1992 and 1997, however, the per capita annual real growth rate in the BMA was only 2.9%, as compared with 6.3% for the whole country (Kakwani and Pothong, 1998, Table 5). The rest of the country was relatively marginal during the 1980s and early 1990s, but participated much more centrally in the growth in the quinquinium before the financial crisis and arguably was more at risk for a reversal of recent gains. Kakwani and Pothong, in fact, claim that though the economic crisis began in the BMA, its adverse impact was much more severe in the rest of the country. Table 7 gives the percentage changes in real wages and in hours worked for the BMA and for all Thailand. The BMA indeed had greater percentage changes in real wages and hours worked than did the rest of the country. Therefore, though the rest of the country may have benefited relatively less from the previous sustained growth, it would appear from this table also to have suffered relatively little from the macro shock, in contrast to some of the claims summarized in the introduction.

Section 4. Multivariate Relations for Key Labor Market Variables and Effects of the Crises

The patterns summarized in Sections 2 and 3 suggest that there have been some important effects of the crisis on key labor market outcomes that affected different groups differentially. In this section we investigate to what extent indicators of the crisis affect standard labor market relations for the key labor market outcomes that are discussed in Section 2 and whether such effects differ among the groups thought to be vulnerable that are considered in Section 3.

Section 4.1 Basic Analytical Framework

The basic framework that we use posits, as is standard in the literature, that hours worked and labor force participation decisions depend on comparisons between the expected returns to spending time in the labor force versus spending time not in the labor force. In the simplest case, the value of time spent in the labor market is given by market wages rates. The decision of whether to participate in the labor force reflects a comparison between wage rates and the value of time not spent in the labor force. We summarize the basic relations and then discuss briefly the others.

Wage rates (W) are posited to be determined by a semilog wage function with right-side variables including individual characteristics such as schooling (S), age (A), and other individual characteristics (X) and a stochastic disturbance term (e) that reflects chance events independent of the individual characteristics:

(1) $\ln W = a_0 + a_1 S + a_2 A + a_3 X + e.$

This general semilog wage relation can be derived from equilibrium investments in human capital including schooling and work experience (related to age and schooling) as in Mincer (1974) or can be viewed as a hedonic price for what characteristics are valued in labor markets, including schooling, age, sex, migrant status and marital status as in Tinbergen (1951, 1956) and Rosen (1974). X further is likely to include location because of regional variations in labor markets (particularly for the present study between the BMA and other areas). The individual characteristics may be rewarded in labor markets because they represent human capital – particularly schooling and age, to the extent that the latter is related to work experience and maturity, and sex to the extent there are sex differences in characteristics such as strength, stamina and manual dexterity that are rewarded in labor markets. But the individual characteristics also in part may represent signaling of unobserved capabilities and preferences (including longer-run labor force attachments), discrimination in labor markets (e.g., against females or recent migrants), or that groups such as recent migrants are less likely to have good information about how labor markets work.

Finally, as is well known, there generally is selectivity regarding for whom wages are observed. This results in the mean of the disturbance term in (1) being nonzero and selectivity biases in the estimated coefficients in relation (1) unless there is control for whom wages are observed. Wages are observed only for those who participate in the labor force and have a wage-paying job. Such decisions are discussed below, but are likely to depend not only on the direct wage determinants in relation (1) but also on family characteristics (F). A standard two-step procedure due to Heckman is first to estimate a probit relation for the dichotomous variable for whether wages are observed

for an individual (WO) as in relation (1A) and then to use these estimates to control for selectivity by including the inverse Mills ratio (8_w) for observing wage rates that is based on the estimates of relation (1A) in the ln wage equation as in relation (1B):

(1A) $WO = b_0 + b_1S + b_2A + b_3X + b_4F + v.$

(1B) $\ln W = a_0 + a_1S + a_2A + a_3X + a_48_w + e.$

If the underlying assumptions are satisfied, the inverse Mills ratio effectively purges the disturbance term of factors related to selectivity in labor force participation so that the estimates of the parameters in relation (1B) are not contaminated by selectivity bias. The inclusion of F in relation (1A) that determines the selected sample, but not directly in relation (1B), permits identification of the selection process and control for it. A variant of relation (1B) can be estimated with a dichotomous dependent variable to indicate whether or not wage rates are above some cutoff, such as the 20th percentile of the distribution of real wages in 1995 used in this paper.

The labor force participation decision (LFP) refers to a dichotomous variable with a value of one if an individual participates in the labor force and zero otherwise (nonparticipation). The decision regarding whether to participate depends on a comparison between expected wage rates (including the probability of receiving wages if one participates) and the value of time in other activities. The value of time in other activities may depend on any or all of the determinants of wage rates and wage employment in labor markets. But in addition, in the usual formulation, it depends on family characteristics because there is likely to be sharing of resources and responsibilities among family members, scale economies within households, and imperfect markets for many of the goods and services produced within households. Therefore the labor force participation decision is posited to depend on schooling, age, other individual characteristics, family characteristics and a disturbance term

(2) $LFP = c_0 + c_1S + c_2A + c_3X + c_4F + u.$

Because LFP is a dichotomous variable, a limited dependent estimators such as a probit or logit yields more efficient estimates than a linear probability model. Note that if all labor force participants received wages, relation (2) and relation (1A) would be identical.

Other labor market variables: We estimate similar relations to those for wages for the other labor market variables: unemployment, duration of search for work conditional on unemployment, hours worked, underemployment, work status, formal sector employment, and industry of employment. The first step refers to selection into the relevant subsample: labor force participation for unemployment, unemployment for duration of search for work conditional on unemployment, and employment for hours worked, underemployment, work status, formal sector employment.[9] The second step

[9] These are all reduced-form relations that use the family characteristics for identification of the selectivity but do not permit, for example, identification of their effects on selection among non-labor force participation, unemployment, employment without receiving wages and wage employment. In principal it would be more efficient to estimate multinomial logits to control for the multiple choices and to identify their separate effects. But the Thai LFS data are not very rich regarding family

then uses the first step estimates to control for selectivity in the estimation of the second-stage relation akin to (1B).

Impact of the crisis: We posit that the crisis may have affected any of the parameters in the multivariate relations of interest. If the wage rate relation is interpreted as a hedonic relation in which the coefficient estimates give the prices for different individual characteristics, for example, all of the coefficients may depend on the state of the macro economy because the state of the macro economy may affect the prices in labor markets for individual characteristics such as schooling and age whether these represent human capital or unobserved characteristics such as labor force attachment. Likewise there may be effects if these coefficients reflect in part labor market discrimination or differential information about labor markets held by different actual or potential employees. If the prices received for individual attributes vary, this may affect all of the labor market outcomes because it induces different choices, as in the example above for labor force participation.

Economic theory does not provide very explicit guidance about how to represent the impact of the aggregate economy on the parameters of these micro labor market relations. We posit that the overall micro state can be represented by the extent to which real per capita GDP differs from the secular trend for the 1990s, which we refer to as the "macro deviation" for short. Table 8 summarizes this measure. By this measure real per capita GDP peaked in 1996 at 11.3% above the trend, which was slightly above the 1995 value of 10.3% above the trend. There were declines in 1997 to 5.2% above the trend, in 1998 to -8.9% below the trend, and in 1999 to -10.2% below the trend. Relative to the trend, therefore, the decline between 1996 and 1997 was -5.1%, the decline between 1996 and 1998 was -19.2%, and the decline between 1996 and 1997 was -20.5%. The crisis, thus, apparently resulted in substantially smaller (more negative) macro deviations than would have occurred if there were simple extrapolations from the 1996 value.

Section 4.2 Estimated Effects

We estimate the relations that are discussed in Section 4.1 using the Thai LFSs for 1990-1999. Because of seasonality, we estimate all relations separately for Round I (February) and Round III (August). We also estimate all relations separately for females and males. For each dependent variable, therefore, we present four estimates in which there are interactions between a set of individual variables and the macro deviations in addition to additive effects of the individual variables. The included individual variables relate to five age groups (with 25-49, prime-age adults, the excluded category), being a migrant, being married, resident outside of BMA residence, and seven schooling categories (with no schooling being the excluded category). This means that impact on the constant (or the additive macro deviation effect) is for the reference group of prime-age, nonmigrant, not-married females/males living in the BMA with no schooling. These estimates, thus, capture the impact of macro deviations on individuals with these different characteristics, but with control for the whole set of characteristics rather than considering each characteristics one at time as in Section 3. The tables in the text present only the interaction and additive effects for macro deviations. The macro crisis, of course, is a negative macro deviation so that if the coefficient estimate for an interaction term between a right-side variable and the macro deviation is positive, the macro crises

characteristics so that such a strategy is unlikely to have sufficient payoff to warrant the added complexities.

reduced the impact of that variable on the dependent variable (and *vice versa* if the coefficient estimate is negative).[10]

(1) Real wages (Table 9):[11] A -10% macro fall reduces the real wage rate for the reference female group by -37% in round I and by -27% in round III.[12] For the reference male group there is a 15% increase in round I and a -21% decrease in round III. For the reference groups, therefore, males fare better than females. But because of differential effects by gender for the included characteristics, on the average as noted in Section 2 females tend, if anything, to fare a little better than males.

A -10% macro deviation reduces female real wage rates by -13% for the 13-14 age group, by -6% for the 15-19 age group, and by -2 to -3% for the 20-24 age group – all relative to prime-age adult females. For older adult females there is a -7% decrease in round I but a 3% increase in round III. For males there is a -3 to -7% reduction for the 15-19 age group and a -4 to -5% reduction for the 20-24 age group – relative to prime-age adult males. But there is a 3 to 19% increase for older adult males and a 7% increase for the 13-14 age group in round I, again relative to adult prime-age males. Thus there is a dominant tendency for real wages for younger adults to fare worse than those for prime-age adults and real wages for prime-age adults to fare worse than those for older adults in response to a macro downturn.

A -10% macro deviation significantly increases wages for most schooling levels for females, relative to no schooling or just completing lower elementary schooling: by 4% for those with less than four grades of schooling, 6-11% for those with upper elementary, 15% for those with some secondary, 13-21% for those with completed secondary, and 13-32% for those with university education. A -10% macro deviation significantly increases wages for most schooling levels for males in round III, relative to no schooling or completing less than four grades of having a university education: by 4% for those with lower elementary schooling, 8% for those with upper elementary, 7% for those with some secondary and 8% for those with completed secondary. In contrast, a -10% macro deviation significantly reduces wages for males in round I by -5% for those with some secondary, -7% for those with completed secondary, and -20% for those with university education – relative to those who had completed upper elementary or less. Thus negative macro shocks appear to be associated differently with schooling for females than for males. For females they basically increase the dispersion of wages associated with different schooling levels, as those with more schooling reap relatively higher returns in comparison with those with less or no schooling. For males they either increase relatively the returns to the intermediate schooling levels relative to those with very little or very much schooling (round III) or reduce the returns from the intermediate and high schooling levels relative to no or little schooling (round I).

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[10] The complete estimates are available upon request. For comparison, each of the four relations is also available without the macro deviation interactions (referred to as "basic" relations).

[11] This discussion refers to effects at the means. The sign patterns are identical for those above the 20 percentile in terms of 1995 real wages.

[12] The ln wage function estimates in Table 9 indicates that ln wage.with a -10% macro shock = -4.735*0.10 + other effects for the reference female group. Thus the ratio of the wage with a -10% macro shock to the wage with a 0% macro shock for the reference female group is e raised to the –0.4735 = 0.6228, which implies a –38% drop in the wage. Similar calculations underlie the other percentage changes presented in the text based on Table 9 (for small coefficient estimates the approximation of using the coefficient estimate from the table directly in percentage terms is good).

A -10% macro decline also has notable differences by gender for the other three individual characteristics included in the log real wage relation. The returns for those living outside of the BMA relative to those in the BMA are increased in all four estimates, but more so for males (12 to 26%) than for females (8 to 9%). The returns for migrants relative to nonmigrants are increased by 9% for females in round I and by about 1% in round III, but reduced by -3 to -12% for males. Married males gained relatively to not married males by from 2 to 4%, but married females lost relative to not married females by 6% in round I (again, with no significant difference in round III).

(2) Hours worked (Table 10): A -10% macro decline reduces average hours worked per week by -4.1 hours for reference females in round I, -3.6 hours for reference males in round I, and -2.2 hours and –1.4 for reference females and males in round III, respectively. While there is a somewhat greater effect on females than on males in round I, the more striking difference is that for both females and males the effects are much larger in round I than in round III. In part perhaps this reflects the less effect on the agricultural sector, which is much more important in employment in round III than in round I.

A -10% macro decline increases significantly average hours worked by 13-14 year old males in both rounds and by females in round III by 1.8/1.4 hours per week, relative to hours worked by prime-age adults. This suggests that these children are going to school less and working more to help their families in the macro crisis. That the only significant effect for the next age group, 15-19 year olds, however, implies a reduction of -0.3 to -0.5 during round I raises questions about such an interpretation. The impact on hours worked by young adults does not vary significantly from that on prime-adults except for females in round III. But older adults significantly reduce hours worked by about -0.5 hours in round III, though part of this reduction is offset by increases of about 0.2 to 0.3 in round I – both relative to prime-age adults.

A -10% macro decline does not cause significantly differential responses across most educational levels. The only exceptions are for those with university education -- females increase their workweek by about 0.9 hours in round I and by 1.3 hours in round III, while males in round III increase their workweek by 0.4 hours.

A -10% macro decline also has some significant effects on hours worked for the other three individual characteristics considered, but with generally less strong gender differentials than for real wages. Work increases by 3.0 to 3.6 hours per week in round I and 2.0 hours per week in round III for those not residing in the BMA in comparison with those residing in the BMA. Work increases by 0.2 to 0.4 hours per week in round I for those married in comparison with those who are not married. Male migrants in both rounds reduce hours per week in comparison with nonmigrants by about -0.3 to -0.4 hours per week, though female migrants in round I increase their hours worked per week by about 0.3 and no significant effect is found for female migrants in round III.

(3) "Underemployment -- whether worked less than 20 hours a week (Table 11): A -10% macro decline is associated with increases in the probabilities of underemployment of from 0.03 to 0.04 for the reference females and slightly less of from 0.02 to 0.03 for the reference males. Only females in the 20-24 and 50+ age groups in round III were significantly more likely (by 0.004 and 0.002, respectively) to increase underemployment than prime-age adults. On the other hand, both females and males in

the 13-14 age group have reduced probabilities of underemployment – from -0.01 to -0.02 for females and -0.01 for males. The same holds in round I for females in the 20-24 age group (-0.003) and for both females (-0.007) and males (-0.003) in the 50+ age group. Therefore, in terms of increased underemployment due to macro declines, there is some tendency for females to experience greater increases than males but the younger and older adult groups tend to fare as well or better than prime-age adults.

A -10% macro decline has very little differential impact on probabilities of underemployment across different schooling levels in round I. The only significant differences from the no schooling reference groups are for males with very limited schooling – a reduction of -0.004 for those with less than four grades of schooling and of -0.002 (at the 10% level) for those with lower elementary schooling. But for round III for every schooling level for both females and males those with some schooling have significantly smaller increases in the probabilities of underemployment than do those with no schooling. For females these probabilities are -0.004 less for some schooling up through upper elementary schooling, but over twice as large at -0.01 for some secondary and university with upper secondary at -0.01. For males, in contrast, the strongest effects are for the lower and middle schooling levels, increasing in absolute values from -0.005 to -0.008 for the range from less than four grades to upper elementary schooling, and -0.01 for upper secondary and university.

A -10% macro decline increases significantly the probability of underemployment by about 0.002 for male migrants in both rounds and for female migrants in round III and for married females by about 0.004 in round III. It reduces significantly the probability of underemployment by -0.01 to -0.03 for those not resident in the BMA and by -0.002 to -0.008 for those married in round I (with larger absolute values for females than for males in both cases).

(4) Labor force participation (Table 12): A -10% macro decline increases significantly the probability of LFP for the reference females by 0.06 in round I and by 0.04 in round III and for the reference males by 0.02 in round I. It increases significantly LFP for some of the younger groups relative to prime-age adults: by from 0.03 to 0.08 for females and 0.02 to 0.04 for males in the 13-14 age group, by 0.04 for females in round III and by 0.01 to 0.03 for males in the 15-19 age group, and by 0.02 for males in round III in the 20-24 age group – though there also is the opposite significant decline of -0.01 for females in round I in the 15-24 age group. Thus the dominant tendency, somewhat more for females than for males, is for increased labor force participation, particularly by younger workers, as apparently family members are shifted out of school, home production and other activities to attempt to help their families deal with the macro crisis.

A -10% macro decline significantly increases LFP relative to those with no schooling only in round III for males with limited schooling (no more than lower elementary) by about 0.01 and for females with upper elementary by about 0.02. It significantly reduces LFP by -0.01 to -0.02 relative to those with no schooling for both males in round I with less than four grades of school, for both females and males in round I with upper elementary, for both females and males in round III with some secondary and for both females and males in round I and females in round III with upper secondary and by -0.02 to -0.03 for both females and males in round I and females in round III with university education. Therefore, LFP tends to increase less for those with more schooling than for those with less or no schooling.

A -10% macro decline increases significantly LFP for male migrants in round I, but reduces it by about -0.01 to -0.02 for female migrants in round I and for both females and males in round III, all relative to nonmigrants (and with the larger differences for round III). It reduces LFP participation significantly by -0.01 to -0.06 for females and by -0.0 to -0.02 for males not residing in the BMA relative to those living in the BMA. It increases significantly female LFP by 0.01 for those married in round I, but reduces it by slightly less for females married in round III relative to those who are not married.

(5) Unemployment rates (Table 13): A -10% macro decline causes significant increases in unemployment rates of from 0.005 to 0.007 for reference females in both rounds and of about 0.008 for reference males in round III. These changes are about 0.003 greater for males 50+ in round I, but are about -0.003 to -0.004 less for females 50+ in round I and for both females and males 50+ in round III. In round III they also are about -0.003 less for males 13-19 years old and -0.007 less for females 13-14 years old. Thus there are fairly small significant effects on unemployment rates, that tend to be significantly smaller yet for some of the younger and older workers relative to those for prime-age adults.

A -10% macro decline significantly reduces the unemployment rate by about -0.006 for males with less than four grades of schooling in round III relative to those with no schooling, but increases the unemployment rates by 0.003 to 0.009 for females in both rounds and for males in round I with lower elementary or higher schooling (plus those with less than four grades for males in round I). Within these groups, moreover, changes in unemployment rates tend to be positively associated with schooling levels.

A -10% macro decline significantly increases unemployment rates by 0.004 for female migrants and by 0.003 for male migrants in round I, but reduces it by about -0.002 for female migrants in round III, all relative to nonmigrants. It increases unemployment rates significantly by 0.004 in round I and by 0.002 in round III for males residing outside of the BMA relative to those residing in the BMA. It reduces it by 0.001 for married males in round III relative to those not married.

(6) Work status as private employee or own account worker versus others as proportion of total workers (Table 14): A -10% macro decline is significantly associated with a reduction in work status as a private employee or own account worker as a proportion of total workers by from -0.09 to -0.18, with the absolute change about twice as large for the reference females in round I versus round III or relative to the reference males in either round. There are further significant reductions in the proportion of workers in this work status of -0.02 to -0.08 for workers in the 13-24 year old range (though not significant for 13-14 old males in round I) relative to prime-age adults. Both females and males 50+ in round III differ significantly by increasing the proportional importance of this work status by about 0.01 more than prime age adults. Thus there is a decline in the proportional importance of work status as a private employee or own account worker in the total associated with a macro decline that is somewhat stronger in round I for females and more generally for younger adults.

A -10% macro decline increases employment as private employees and on own account significantly by 0.01 to 0.07 for those with more schooling relative to those with no or little schooling, with the biggest effects for females in round I and males in round

III. It also increases this work status significantly by about 0.02 for female migrants in round III relative to nonmigrants (though with a reduction of 0.01 for male migrants in the same round), by from 0.05 to 0.19 for those not residing in the BMA relative to those residing in the BMA (with greater differential effects for females and for round I), and by about 0.01 for married males in round III relative to those not married (though with opposite effects of from -0.02 in round I and –0.01 in round III for married women).

(7) Working in formal sector as proportion of total workers (Table 15): A -10% macro decline is associated with significant declines in the relative importance of formal sector employment of -0.08 to -0.10 for the reference females and of -0.13 to -0.16 for the reference males. This shift was from -0.01 to -0.06 more for females and males in the 15-24 age group (as well as for 13-14 year old females in round III) than for prime-age adults (with larger differentials for females than for males). For adults 50+ in round III there is an increase of 0.01 for females and of 0.02 for males. Thus there is a general tendency for a significant reduction in the share of formal sector employment, somewhat more for younger workers and for females.

A -10% macro decline also is associated with significant increases of 0.01 to 0.07 in share of formal sectors workers for higher schooling levels (most strongly for some secondary or completed upper secondary) for both females and males relative to those with no or little schooling, with much larger effects in round III than in round I. Migrants, moreover, had significant declines of from -0.07 to -0.12 relative to nonmigrants for females in round I and males in both rounds, with larger absolute effects for males than for females. Those living outside of the BMA, on the other hand, have significant increases of from 0.06 to 0.16 in formal sector sectors of employment relative to those living in the BMA, with larger differentials for males than for females and for round I than for round III. Married females in both rounds, finally, reduces their share in the formal sector by about -0.01 to -0.02 relative to those not married, while married males significantly increased their share relative to nonmarried males by 0.01 in round I.

Section 5. Conclusion

Several major themes come out of this investigation.

First, the aggregate labor market impacts of the crisis seem to have been fairly small. As noted in the introduction, the annual growth rate in real GDP per capita declined to -2.3% in 1997 and to -10.4% for 1998 from 4.5% for 1996 and from an average of 7.2% for 1990-5, and real GDP per capita relative to the underlying secular growth trend for the 1990s fell compared to the peak in 1996 by -5.2% in 1997, -20.2% in 1998, and -20.5% in 1999. These are considerable drops in actual and potential product. In sharp contrast, total employment dropped by only -2.7 and -2.3% for rounds I and III in 1998, and recovered in round I of 1999 to 99.3% of the peak 1997 level.[13] The

[13] Some of the labor market statistics can be presented so as to appear that there were large effects in terms of percentage changes. For example, the round I unemployment and underemployment rates more than doubled between 1997 and 1998 – or, to put it another way, the 1998 values were 209% and 277% of the respective values for 1997. But in both cases the changes reflect relatively small changes from very small bases – from 2.2 to 4.6% and from 1.8 to 5.0%, respectively. That is not to say that those affected may not have fared badly. But, compared with the experiences of many other economies, changes in these rates of 2.4 and 3.2% are not all that large.

percentage changes in real GDP and in total employment in 1998 imply an elasticity of employment with respect to output of about 0.3, which seems surprisingly small. It would appear that many employers were hoarding labor perhaps in anticipation of a fairly quick recovery. In part the low implied employment-output elasticity reflects a reduction in hours worked (-5.6% in 1998-I) but this was quite transitory and hours worked increased 1.6% in 1998-III and 2.8% in 1999-I (both relative to the respective rounds a year earlier). While it is true that real wage rates dropped by - 14.7% for the year ending in 1998-III and by -8.5% for the year ending in 1999-I, these followed as large or larger percentages increases in the previous year.

Second, some of the larger effects that were experienced were recorded only with lags. The crisis started in July 1997 with the devaluation. But total employment in the year prior to 1997-III (August) is recorded to have increased by 2.3%, with the first downturns in employment in both rounds I and III not recorded until 1998. Total formal sector employment, real wage rates and the proportion of workers with real wages above the 20th percentile in 1995 did not record downturns until 1998-III and 1999-I.[14] Thus there were some important lags in quantity adjustments and perhaps more so in price adjustments. Therefore analysis that focused only on months or even the year subsequent to July 1997 would miss some important aspects of what transpired in the labor market that became apparent only in the second year after July 1997.

Third, some of the recorded effects appear puzzling. Most striking in this regard, as noted above, are the reported growth rates in real wages of 8.0% in the year prior to 1998-I and of 24.0% in the year prior to 1998-III. These, particularly the latter, do not appear to be credible. The reported 1998 real wage increases may reflect in part an under-reporting of hours worked for round I (these are reported to have declined by -5.6% in the year prior to 1998-I, but to have increased by 1.6% in the year prior to 1998-III) or lags in the adjustment of the price deflator.

Fourth, those who were affected most negatively include some – but not others – of the groups on which emphasis has been placed in previous studies. As noted in the introduction, previous studies have claimed that those with low schooling, recent migrants, those residing outside of the BMA (and, more so, outside of the Central Region), young adults, older adults, and women fared relatively badly. Some of these claims seem *a priori* plausible because they refer to groups who are more marginal in terms of labor markets. But *a priori* some of them are not obvious – particularly that those outside of the BMA were more adversely affected given that the direct effects were concentrated in industries centered in the BMA and that females were more adversely affected given the prior dominance of males in the construction industry which was hit far harder than any other sector. Our investigation suggests that young adults and migrants did tend to be affected more negatively. But that, in contrast to previous claims, older adults, those residing outside of the BMA, females and perhaps those with low schooling, if anything, tended to fare as well or better than others. In part the difference between our conclusions in these regards and those of previous studies reflect differences in approaches. For example, our focus on reported changes in the labor market versus the Kakwani and Pothong (1998) focus on foregone income that would have been reaped had pre-crisis growth trends continued, which had been higher (though from lower levels) outside of the BMA than in the BMA in the mid 1990s. But whatever the cause of the

[14] But see the next point regarding the real wages.

differences, our findings raise some important questions about to what extent some of the alleged groups were particularly vulnerable to the macro crisis and, thus, what might be desired policy responses.

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Table 1. Number of Households in Each Round of Thai Labor Force Surveys, 1990-1999

Year	Number of Households
1990	27.780
1991	27,780
1992	28,515
1993	28,515
1994	60,492
1995	60,576
1996	60,672
1997	60,672
1998	60,663
1999	60,996

Source: NSO, Report of the Labor Force Survey: Whole Kingdom, various issues.

Table 2. Annual Percentage Changes in Selected Key Labor Market Variables for 1995-9, Rounds I and III.

	Round I				Round III		
	1995-6	**1996-7**	**1997-8**	**1998-9**	**1995-6**	**1996-7**	**1997-8**
(1) Total Employment Annual Percentage Changes							
Total	3.6	0.6	-2.7	2.0	-1.1	2.3	-2.3
Female	4.2	0.5	-2.8	2.9	-2.1	3.2	-3.1
Male	3.1	0.7	-2.7	1.3	-0.3	1.5	-1.7
(2) Employment in Major Sectors Annual Percentage Changes							
Agriculture							
Total	2.4	-1.6	-2.3	7.8	-4.8	2.8	-0.4
Female	4.0	-1.4	-8.6	7.9	-5.6	2.9	-5.6
Male	1.3	-1.8	2.5	7.7	-4.2	2.7	4.1
Construction							
Total	18.1	-4.4	-31.6	-23.7	17.7	-7.4	-36.3
Female	29.0	-5.8	-44.1	-30.5	36.2	-2.7	-53.2
Male	15.7	-4.0	-28.7	-22.5	13.8	-8.5	-31.8
Manufacturing							
Total	2.7	0.6	-1.4	-1.4	-1.0	-1.2	-2.2
Female	1.7	-0.9	1.1	-3.4	-4.9	0.1	-0.6
Male	3.8	2.2	-3.9	0.6	2.9	-2.3	-3.7
Services							
Total	-0.9	7.3	7.5	3.3	-0.6	5.3	6.4
Female	5.2	5.3	9.2	3.3	4.1	4.7	8.7
Male	-6.8	9.5	5.7	3.4	-5.3	5.9	4.0
Others (mining, electricity, commercial, transport & communication, and unknown)							
Total	3.4	3.3	2.3	1.4	3.9	4.9	-2.7
Female	1.5	3.2	4.0	3.9	1.7	6.5	0.6
Male	4.8	3.4	1.1	-0.6	5.6	3.7	-5.2

Table 2 continued

(3) Formal Sector Employment Annual Percentage Changes							
Total	8.1	0.3	2.6	-4.8	2.9	3.6	-2.4
Female	12.6	0.0	7.4	-4.3	3.9	7.6	-0.7
Male	5.2	0.5	-0.7	-5.2	2.1	0.8	-3.6
(4) Labor Force Participation Rates Annual Percentage Changes							
Total	0.1	-1.2	-1.0	0.5	-2.3	0.3	-1.5
Female	0.0	-1.7	-1.5	1.2	-3.2	0.9	-2.4
Male	0.1	-0.7	-0.6	0.0	-1.4	-0.2	-0.7
(5) Unemployment Rates in Percentages (for second year in column head)							
Total	2.0	2.2	4.6	5.2	1.1	0.9	3.4
Female	2.3	2.5	4.5	5.5	1.1	0.9	3.4
Male	1.8	1.9	4.7	5.0	1.0	0.9	3.4
(6) Underemployed Rates in Percentages (Working Less than 20 Hours per Week) (for second year in column head)							
Total	2.1	1.8	5.0	2.9	1.8	2.2	2.9
Female	3.0	2.0	6.0	3.0	2.0	2.5	3.2
Male	2.0	1.0	4.0	2.0	1.6	1.9	2.7
(8) Work Status of Employed Persons Annual Percentage Changes							
Private Employee							
Total	8.9	-0.3	-8.2	-4.4	7.2	2.0	-10.0
Female	7.7	1.9	-4.7	-3.3	4.5	6.5	-7.3
Male	9.7	-1.7	-10.6	-5.2	9.2	-1.3	-12.0
Employer and Government Employee							
Total	1.9	1.2	8.3	3.7	-7.7	0.7	12.3
Female	7.7	-1.2	16.6	0.5	-4.5	2.5	18.0
Male	-0.7	2.4	4.5	5.3	-9.1	-0.1	9.4
Own Account Worker and Unpaid Family Worker							
Total	0.2	1.2	-0.8	6.1	-3.8	2.7	-0.7
Female	1.7	-0.2	-4.2	7.4	-4.5	1.8	-3.4
Male	-1.1	2.4	2.2	5.1	-3.2	3.5	1.8

Table 2 continued

(10) Real Wage Annual Percentage Changes							
Total	2.2	7.2	8.0	-8.5	-1.5	24.0	-14.7
Female	4.0	8.4	6.6	-7.7	-1.1	28.1	-17.1
Male	1.3	6.7	9.2	-8.9	-2.0	22.0	-12.9
(11) Proportion of Workers with Real Wage above the 1995 First Quintile Annual Percentage Changes							
Total	9.0	6.3	1.2	-1.5	8.3	6.9	-1.5
Female	14.3	9.1	2.4	-2.1	11.8	10.0	-0.8
Male	6.3	4.8	0.6	-1.0	6.1	5.2	-1.9
(12) Hours Worked Annual Percentage Changes							
Total	0.5	-0.3	-5.6	2.8	-1.5	-2.5	1.6
Female	-0.1	-0.4	-6.1	3.6	-1.8	-2.1	1.6
Male	1.0	-0.3	-5.2	2.2	-1.3	-2.8	1.6

Source: Appendix A Tables, available upon request from the authors or ICSEAD.

Table 3. Annual Percentage Changes in Real Wages and Hours Worked by Schooling Levels

School Levels	Round I				Round III		
	1995-6	1996-7	1997-8	1998-9	1995-6	1996-7	1997-8
Real Wage Annual Percentage Changes							
Primary	5.7	5.6	1.7	-10.3	3.3	9.0	-12.9
Secondary	-3.6	1.9	2.1	-12.3	-13.8	10.1	-14.1
University	7.2	0.7	-1.3	-10.4	5.4	29.1	-26.0
Hours Worked Annual Percentage Changes							
Primary	0.6	-0.4	-4.8	2.3	-2.0	-0.8	1.1
Secondary	1.2	0.2	-7.2	4.2	0.9	-4.4	2.0
University	0.6	0.0	-5.0	5.6	-0.1	-12.8	13.7

Source: Appendix A Tables A.18.1, A.23.1 (available upon request).

Table 4. Annual Percentage Changes in Real Wages and Hours Worked by Selected Age Ranges

Age Range	Round I				Round III		
	1995-6	1996-7	1997-8	1998-9	1995-6	1996-7	1997-8
Real Wage Annual Percentage Changes							
20-24	4.5	5.3	6.0	-13.4	0.3	10.7	-15.3
25-49	0.5	5.7	6.1	-10.7	-3.6	24.3	-18.6
50+	4.5	2.9	13.8	5.1	6.0	26.2	-6.0
Hours Worked Annual Percentage Changes							
20-24	1.5	-0.8	-7.2	3.3	-1.9	-2.0	1.3
25-49	0.9	-0.4	-5.6	3.4	-1.7	-3.0	2.4
50+	-0.8	1.0	-3.2	0.6	-2.2	0.1	0.8

Source: Appendix A Tables A.17.1, A.22.1 (available upon request).

Table 5. Annual Percentage Changes in Real Wages and Hours Worked by Migratory Status

Migratory Status	Round I				Round III		
	1995-6	1996-7	1997-8	1998-9	1995-6	1996-7	1997-8
Real Wage Annual Percentage Changes							
Migrant	3.9	4.4	3.7	-11.7	-1.7	15.5	-14.8
Nonmigrant	2.2	6.8	9.8	-7.8	-1.7	24.8	-13.9
Hours Worked Annual Percentage Changes							
Migrant	-0.1	-0.3	-6.0	3.4	-1.4	-4.0	2.2
Nonmigrant	0.6	-0.2	-5.6	2.7	-1.5	-2.1	1.4

Source: Appendix A Tables A.20.1, A.25.1 (available upon request).

Table 6. Annual Percentage Changes in Real Wages and Hours Worked by Marital Status

Marital Status	Round I				Round III		
	1995-6	1996-7	1997-8	1998-9	1995-6	1996-7	1997-8
Real Wage Annual Percentage Changes							
Single	3.5	10.2	7.7	-9.3	-0.3	25.0	-16.4
Married	0.3	6.8	7.7	-7.8	-2.9	24.8	-14.9
Unmarried[a]	10.6	-4.2	13.2	-14.1	6.3	13.3	-7.6
Hours Worked Annual Percentage Changes							
Single	1.0	-0.6	-10.3	6.3	-0.6	-5.2	2.5
Married	0.2	-0.2	-4.2	1.8	-2.0	-1.6	1.4
Unmarried[a]	2.3	-0.2	-4.7	2.4	-1.1	-0.5	1.5

Source: Appendix A Tables A.19.1, A.24.1 (available upon request).
[a] Divorced, widowed, separated

Table 7. Annual Percentage Changes in Real Wages and Hours Worked by BMA versus Other

Residence	Round I				Round III		
	1995-6	1996-7	1997-8	1998-9	1995-6	1996-7	1997-8
Real Wage Annual Percentage Changes							
BMA	5.5	14.6	15.2	-13.1	-8.7	40.8	-52.6
All Thailand	2.2	7.2	8.0	-8.5	-1.5	24.0	-14.7
Hours Worked Annual Percentage Changes							
BMA	1.3	-0.6	-18.4	22.0	1.9	-13.1	-0.1
All Thailand	0.5	-0.3	-5.6	2.8	-1.5	-2.5	1.6

Source: Appendix A Tables A.21.1, A.26.1 (available upon request).

Table 8. Real GDP Per Capita, Trend and Deviation from Trend

Year	actual (Y)	Trend (YE)[a]	Deviation from trend (Y-YE)	% deviation from trend = 100*(Y - YE)/YE
1990	34,838	37,667	-2,829	-7.5
1991	37,329	38,990	-1,661	-4.3
1992	39,836	40,359	-522	-1.3
1993	42,648	41,776	872	2.1
1994	45,885	43,243	2,641	6.1
1995	49,379	44,762	4,617	10.3
1996	51,581	46,334	5,247	11.3
1997	50,431	47,961	2,470	5.2
1998	45,232	49,645	-4,413	-8.9
1999	46,132	51,388	-5,255	-10.2
[a] YE = exp(10.50205 + 0.034512*Year)				

Note: Actual (Y) for 1999 is estimated based on the forecast growth rate of 3 % for real GDP, according to LOI 8 (Letter of Intent No.8) and the population growth of about 1 %.

Table 9. Dependent Variable: Ln Real Wage

Macro Deviation from Trend Interacted with:	Round I		Round III	
	Female	**Male**	**Female**	**Male**
Reference individuals[a]	4.735	-1.442	3.139	2.271
	(18.19)	(-3.28)	(12.51)	(8.39)
Ages (excluded category 25-49)				
13-14	1.377	-0.722	1.373	0.380
	(5.53)	(-2.22)	(5.09)	(1.15)
15-19	0.564	0.284	0.644	0.722
	(6.96)	(3.16)	(6.76)	(6.64)
20-24	0.179	0.451	0.328	0.373
	(2.94)	(7.68)	(4.88)	(5.21)
50+	0.730	-1.665	-0.331	-0.264
	(6.06)	(-10.22)	(-2.86)	(-2.82)
Schooling (excluded category no schooling)				
<4 grades	-0.386	-0.017	0.386	-0.129
	(-2.19)	(-0.09)	(2.03)	(-0.62)
Lower elementary	-0.090	-0.205	-0.182	-0.397
	(-0.83)	(-1.53)	(-1.51)	(-2.71)
Upper elementary	-0.954	0.011	-0.580	-0.755
	(-8.08)	(0.06)	(-4.66)	(-4.86)
Some secondary	-1.354	0.499	-1.373	-0.674
	(-9.80)	(2.60)	(-9.00)	(-3.76)
Upper secondary	-1.872	0.650	-1.178	-0.760
	(-11.26)	(2.89)	(-6.17)	(-3.77)
University or teacher college	-2.767	2.153	-1.198	-0.350
	(-12.34)	(6.22)	(-4.72)	(-1.39)
Other individual characteristics (dichotomous variables)				
Migrant	-0.855	1.140	-0.088	0.252
	(-9.21)	(9.58)	(-0.88)	(3.72)
Resident outside of BMA	-0.852	-2.304	-0.787	-1.119
	(-11.82)	(-23.10)	(-6.81)	(-10.25)
Married	0.594	-0.400	0.106	-0.161
	(9.13)	(-5.56)	(1.29)	(-2.66)

N.B. Multivariate relations also include the same right-side variables without interactions with the deviation from the macro trend. t statistics are in parentheses under the coefficient estimates.

[a] Prime-age adults (25-49 years of age), no schooling, reside in BMA, nonmigrants, not married.

Table 10. Dependent Variable: Hours Worked

Macro Deviation from Trend Interacted with:	Round I		Round III	
	Female	Male	Female	Male
Reference individuals[a]	40.623	35.195	22.400	14.462
	(21.24)	(6.61)	(11.39)	(6.36)
Ages (excluded category 25-49)				
13-14	5.526	-18.912	-13.813	-17.540
	(1.29)	-4.53	(-3.81)	(-4.95)
15-19	5.043	2.777	-4.357	1.937
	(3.09)	(1.80)	(-2.76)	(1.24)
20-24	0.156	0.668	2.775	0.808
	(0.13)	(0.59)	(2.24)	(0.67)
50+	-3.144	-2.291	4.633	4.563
	(-2.95)	(-2.64)	(4.33)	(4.79)
Schooling (excluded category no schooling)				
<4 grades	-0.613	-2.065	-8.062	1.663
	(-0.23)	(-0.78)	(-3.08)	(0.59)
Lower elementary	1.151	0.108	-6.687	0.312
	(0.72)	(0.06)	(-4.28)	(0.16)
Upper elementary	0.448	1.839	-10.740	-0.299
	(0.25)	(0.93)	(-5.92)	(-0.14)
Some secondary	2.929	0.965	-4.036	2.386
	(1.45)	(0.48)	(-1.93)	(1.10)
Upper secondary	-3.095	-2.077	-13.382	-2.876
	(-1.44)	(-0.97)	(-5.96)	(-1.24)
University or teacher college	-8.587	-2.465	-13.259	-4.176
	(-4.43)	(-1.16)	(-6.56)	(-1.82)
Other individual characteristics (dichotomous variables)				
Migrant	-2.580	2.540	-0.230	3.592
	(-2.48)	(3.06)	(-0.212)	(4.01)
Resident outside of BMA	-35.984	-30.332	-20.184	-20.391
	(-34.25)	(-31.74)	(-17.24)	(-18.91)
Married	-2.077	-3.539	5.888	0.493
	(-2.50)	(-4.04)	(6.81)	(0.52)

N.B. Multivariate relations also include the same right-side variables without interactions with the deviation from the macro trend. t statistics are in parentheses under the coefficient estimates.

[a] Prime-age adults (25-49 years of age), no schooling, reside in BMA, nonmigrants, not married.

Table 11. Dependent Variable: below 20 hours a week

Macro Deviation from Trend Interacted with:	Round I		Round III	
	Female	**Male**	**Female**	**Male**
Reference individuals[a]	-0.405	-0.284	-0.319	-0.230
	(-22.32)	(-18.47)	(-16.03)	(-13.16)
Ages (excluded category 25-49)				
13-14	0.072	0.091	0.163	0.096
	(2.78)	(5.11)	(7.68)	(6.18)
15-19	0.014	0.016	0.045	0.007
	(0.99)	(1.56)	(3.35)	(0.66)
20-24	0.031	0.011	-0.039	-0.011
	(2.42)	(1.18)	(-2.99)	(-1.06)
50+	0.074	0.029	-0.024	-0.005
	(7.74)	(4.43)	(-2.56)	(-0.63)
Schooling (excluded category no schooling)				
<4 grades	0.004	0.041	0.038	0.052
	(0.16)	(2.41)	(1.74)	(2.66)
Lower elementary	-0.019	0.019	0.042	0.078
	(-1.45)	(1.69)	(3.19)	(5.76)
Upper elementary	-0.014	0.001	0.036	0.076
	(-0.89)	(0.06)	(2.17)	(5.07)
Some secondary	-0.003	0.001	0.093	0.010
	(-0.16)	(0.01)	(5.29)	(6.59)
Upper secondary	0.001	-0.001	0.137	0.109
	(0.05)	(-0.07)	(6.347)	(6.46)
University or teacher college	-0.009	-0.002	0.095	0.109
	(-0.41)	(-0.09)	(3.85)	(5.67)
Other individual characteristics (dichotomous variables)				
Migrant	0.002	-0.023	-0.025	-0.023
	(0.22)	(-3.28)	(-2.04)	(-2.89)
Resident outside of BMA	0.291	0.226	0.224	0.136
	(23.17)	(23.59)	(15.26)	(13.38)
Married	0.079	0.015	-0.043	-0.013
	(9.80)	(2.14)	(-5.06)	(-1.58)

N.B. Multivariate relations also include the same right-side variables without interactions with the deviation from the macro trend. t statistics are in parentheses under the coefficient estimates.

[a] Prime-age adults (25-49 years of age), no schooling, reside in BMA, nonmigrants, not married

Table 12. Dependent Variable: Labor Force Participation

Macro Deviation from Trend Interacted with:	Round I		Round III	
	Female	**Male**	**Female**	**Male**
Reference individuals[a]	-0.552	-0.189	-0.368	-0.047
	(-12.42)	(-5.73)	(-8.08)	(-1.44)
Ages (excluded category 25-49)				
13-14	-0.337	-0.229	-0.751	-0.440
	(-5.82)	(-7.02)	(-12.96)	(-13.64)
15-19	0.082	-0.089	-0.359	-0.293
	(2.26)	(-3.86)	(-9.36)	(-12.31)
20-24	0.119	-0.019	0.027	-0.176
	(3.60)	(-0.83)	(0.77)	(-7.20)
50+	0.021	-0.009	-0.038	-0.018
	(0.86)	(-0.44)	(-1.42)	(-0.92)
Schooling (excluded category no schooling)				
<4 grades	-0.022	0.022	-0.039	-0.074
	(-0.38)	(0.54)	(-0.66)	(-1.89)
L0ower elementary	0.043	0.061	0.049	-0.068
	(1.25)	(2.36)	(1.42)	(-2.72)
Upper elementary	0.128	0.106	-0.177	-0.002
	(3.06)	(3.43)	(-4.02)	(-0.07)
Some secondary	-0.002	0.043	0.222	0.078
	(-0.05)	(1.40)	(4.62)	(2.57)
Upper secondary	0.121	0.087	0.146	0.048
	(2.48)	(2.75)	(2.88)	(1.53)
University or teacher college	0.283	0.187	0.269	0.054
	(5.20)	(5.04)	(4.71)	(1.45)
Other individual characteristics (dichotomous variables)				
Migrant	0.095	-0.040	0.228	0.188
	(3.42)	(-2.05)	(7.69)	(9.44)
Resident outside of BMA	0.589	0.172	0.138	0.039
	(21.23)	(9.33)	(4.79)	(2.13)
Married	-0.113	-0.002	0.071	-0.007
	(-5.06)	(-0.13)	(3.04)	(-0.38)

N.B. Multivariate relations also include the same right-side variables without interactions with the deviation from the macro trend. t statistics are in parentheses under the coefficient estimates.
[a] Prime-age adults (25-49 years of age), no schooling, reside in BMA, nonmigrants, not married

Table 13. Dependent Variable: Unemployment Rate

Macro Deviation from Trend Interacted with:	Round I		Round III	
	Female	**Male**	**Female**	**Male**
Reference individuals[a]	-0.049	-0.002	-0.068	-0.079
	(-1.91)	(-0.08)	(-3.65)	(-4.13)
Ages (excluded category 25-49)				
13-14	0.031	0.033	0.072	0.034
	(0.72)	(1.06)	(2.66)	(1.73)
15-19	0.004	-0.011	0.007	0.030
	(0.23)	(-1.01)	(0.56)	(3.78)
20-24	0.001	0.007	-0.003	0.006
	(0.11)	(0.83)	(-0.30)	(0.99)
50+	0.035	-0.035	0.043	0.039
	(2.39)	(-2.86)	(3.99)	(4.19)
Schooling (excluded category no schooling)				
<4 grades	-0.034	-0.051	-0.013	0.057
	(-1.08)	(-1.74)	(-0.52)	(2.49)
Lower elementary	-0.047	-0.034	-0.032	0.012
	(-2.48)	(-1.73)	(-2.12)	(0.69)
Upper elementary	-0.044	-0.063	-0.030	0.020
	(-2.11)	(-3.18)	(-1.76)	(1.07)
Some secondary	-0.092	-0.045	-0.027	0.001
	(-3.8)	(-2.17)	(-1.40)	(0.05)
Upper secondary	-0.067	-0.044	-0.039	0.027
	(-2.59)	(-2.05)	(-2.06)	(1.43)
University or teacher college	-0.090	-0.066	-0.045	0.029
	(-3.69)	(-3.01)	(-2.52)	(1.52)
Other individual characteristics (dichotomous variables)				
Migrant	-0.038	-0.025	0.015	-0.005
	(-3.58)	(-3.93)	(1.90)	(-1.02)
Resident outside of BMA	0.002	-0.043	-0.0001	-0.019
	(0.09)	(-4.05)	(-0.01)	(-2.76)
Married	-0.014	-0.003	-0.001	0.015
	(-1.36)	(-0.38)	(-0.15)	(2.65)

N.B. Multivariate relations also include the same right-side variables without interactions with the deviation from the macro trend. t statistics are in parentheses under the coefficient estimates.

[a] Prime-age adults (25-49 years of age), no schooling, reside in BMA, nonmigrants, not married.

Table 14. Dependent Variable: Work status

Macro Deviation from Trend Interacted with:	Round I		Round III	
	Female	**Male**	**Female**	**Male**
Reference individuals[a]	1.815	0.866	1.139	1.071
	(26.80)	(11.89)	(15.57)	(12.32)
Ages (excluded category 25-49)				
13-14	0.471	0.155	0.423	0.328
	(3.22)	(1.32)	(3.01)	(2.57)
15-19	0.787	0.309	0.595	0.526
	(13.97)	(6.97)	(10.29)	(10.26)
20-24	0.308	0.191	0.461	0.343
	(7.32)	(5.74)	(10.27)	(8.78)
50+	-0.009	0.005	-0.123	-0.134
	(-0.26)	(0.16)	(-3.17)	(-3.72)
Schooling (excluded category no schooling)				
<4 grades	0.015	-0.094	0.068	-0.599
	(0.16)	(-0.99)	(0.72)	(-5.33)
Lower elementary	-0.113	-0.059	-0.023	-0.304
	(-2.06)	(-0.90)	(-0.40)	(-3.96)
Upper elementary	-0.261	-0.113	-0.187	-0.472
	(-4.19)	(-1.65)	(-2.86)	(-5.89)
Some secondary	-0.580	-0.330	-0.386	-0.520
	(-8.30)	(-4.75)	(-5.12)	(-6.30)
Upper secondary	-0.493	-0.299	-0.293	-0.502
	(-6.69)	(-4.14)	(-3.62)	(-5.80)
University or teacher college	-0.639	-0.347	-0.416	-0.651
	(-9.48)	(-4.85)	(-5.62)	(-7.57)
Other individual characteristics (dichotomous variables)				
Migrant	-0.013	0.033	-0.223	0.135
	(-0.35)	(1.24)	(-5.68)	(4.37)
Resident outside of BMA	-1.926	-0.752	-0.967	-0.542
	(-50.67)	(-24.84)	(-21.96)	(-13.97)
Married	0.162	-0.026	0.087	-0.150
	(5.43)	(-0.98)	(2.74)	(-4.73)

N.B. Multivariate relations also include the same right-side variables without interactions with the deviation from the macro trend. t statistics are in parentheses under the coefficient estimates.

[a] Prime-age adults (25-49 years of age), no schooling, reside in BMA, nonmigrants, not married.

Table 15. Dependent Variable: Formal Sector as Proportion of Total

Macro Deviation from Trend Interacted with:	Round I		Round III	
	Female	**Male**	**Female**	**Male**
Reference individuals[a]	1.047	1.610	0.783	1.328
	(15.83)	(19.78)	(12.94)	(16.21)
Ages(excluded category(25-49)				
13-14	0.155	0.259	0.236	0.147
	(1.10)	(1.56)	(1.99)	(0.98)
15-19	0.565	0.302	0.495	0.286
	(11.90)	(5.78)	(11.95)	(5.60)
20-24	0.202	0.191	0.418	0.134
	(5.63)	(5.05)	(12.85)	(3.55)
50+	0.044	-0.046	-0.078	-0.158
	(1.10)	(-1.42)	(-2.09)	(-4.74)
Schooling (excluded category no schooling)				
<4 grades	-0.096	-0.163	0.081	-0.401
	(-1.01)	(-1.56)	(0.09)	(-3.79)
Lower elementary	-0.040	0.037	-0.154	-0.454
	(-0.69)	(0.50)	(-2.90)	(-6.15)
Upper elementary	-0.011	-0.122	-0.369	-0.584
	(-0.17)	(-1.59)	(-6.42)	(-7.54)
Some secondary	-0.222	-0.170	-0.516	-0.721
	(-3.33)	(-2.19)	(-8.43)	(-9.18)
Upper secondary	-0.142	-0.260	-0.464	-0.754
	(-2.05)	(-3.21)	(-7.26)	(-9.23)
University or teacher college	-0.053	-0.322	-0.373	-0.602
	(-0.77)	(-3.84)	(-5.86)	(-7.08)
Other individual characteristics (dichotomous variables)				
Migrant	0.083	0.122	-0.033	0.066
	(2.72)	(4.42)	(-1.19)	(2.33)
Resident outside of BMA	-1.365	-1.567	-0.601	-0.650
	(-41.66)	(-47.61)	(-19.97)	(-19.89)
Married	0.177	-0.062	0.135	-0.031
	(6.84)	(-2.04)	(5.65)	(-1.02)

N.B. Multivariate relations also include the same right-side variables without interactions with the deviation from the macro trend. t statistics are in parentheses under the coefficient estimates.

[a] Prime-age adults (25-49 years of age), no schooling, reside in BMA, nonmigrants, not married.