The ILO experience in quickly estimating the impact of financial crisis on the labour market

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Introduction

The world economy has been significantly affected by the 2008 financial crisis. The credit crisis leading to the bankruptcy of large and well established investment banks as well as commercial banks in various countries around the world and high prices of oil and other primary commodities have affected the economic activities and labour markets around the world.

There was urgent need to have accurate and detailed data and information on how the economic crisis impacts employment and unemployment so that appropriate evidence-based policies are developed and monitored.

Although the ILO Bureau of Statistics does collect national monthly and/or quarterly data on employment and unemployment, given the fact that developing and developed countries were differently affected by the economic crisis, there was a need to come up with global and regional estimates of employment and employment trends.

In order to quickly estimate the impact of financial crisis on the labour market the ILO Bureau of Statistics, has developed a methodology for estimating the changes in the current levels and rates of employment and unemployment at the global and regional level

The purpose of this paper is to describe the methodology used to generate regional and global estimates. The first part provides an overview of the data availability; the second discusses various methods of aggregation at regional and global levels, various models for imputing the missing values and the types of sensitivity analysis done; and the last part presents some of the estimates, and looks at future work that should lead to better and more comprehensive estimates.

All estimates, together with country data and some charts, are updated each month and disseminated on the ILO job crisis observatory website at www.ilo.org/jobcrisis.

Data availability

The ILO has been collecting and disseminating statistics on labour issues since 1925. The Bureau also collects and disseminates the relevant national methodological information used to produce these statistics. All the information collected by the Bureau are stored in a series of electronic databases which are used for printed and electronic publications, for analysis and for answering users' requests for statistics and methodological information on national practices. They are available for consultation/downloading at http://laborsta.ilo.org/.

In addition to annual data the Bureau collects and disseminates national monthly and/or quarterly data on the following topics:
- employment, (total, in non-agricultural activities, in manufacturing), total and paid employment;
- unemployment (level and rates);
- hours of work;
- wages,
- consumer price indices (all-items and food).

The data are collected from official national publications submitted to the ILO, received routinely from national statistical services and, increasingly, from national statistical websites. At the moment more than 80% of the periodic series are updated by collecting data directly from the web.

Producing estimates of the trends at regional and global level would have been a simple and straightforward exercise if all the elements required for making such estimates were (i) available, (ii) available within a very short time after the and of the reference period and (iii) if all national data were comparable. Unfortunately this is not the case: not all countries produce monthly data on employment and employment, and out of those that do produce monthly data not all do so in a timely fashion. For example, out of 200 countries and territories only 65 produce statistics on employment with monthly or quarterly periodicity, and 68 produce periodic data on unemployment. In addition, there is a time lag; it takes between 3 and 6 months before the national data for the reference period are processed and made available to the public.

Differences in the reference period (monthly average, quarterly averages, 3-month-moving average[1]) and in the population/geographic/enterprise coverage are additional constrains in producing regional and global estimates.

Aggregations

Measurement objective

Before aggregating the data an important discussion had to be made regarding the main objective of the global estimates because, depending on the purpose the user has in mind, the global estimates may be constructed in different ways. The primary purpose of the global estimate might be: (i) to measure the overall change in employment/unemployment in the world or (ii) to assess the average change in employment/unemployment across all countries in the world. If the main objective is to measure the change in total employment/ unemployment in the world then the national data should be weighted to account for the differences in the population size of the countries and their importance in the global economy. On the other hand, if the main objective is to estimate average changes in the emplyoment7unemplyoment across countries, national data could be averaged without any explicit weighting (e.g. each country is given a weight of 1). The first objective was regarded as more appropriate.

Regional groupings

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[1] Out of 68 countries with periodic data on unemployment 16 countries have monthly estimates and about 50 have quarterly estimates.

Given the fact that structure of the labour markets in the developed countries is deferent from the ones in the developing countries, the countries are groped in only two groups (developing and developed countries). Possibility of grouping the countries by continent has also been explored but this idea was abandoned because of the insufficient number of countries with data in all continents except in Europe.

The decision to produce estimates only for the developed and the developing countries was reinforced by the fact that the employment/unemployment trend in the developing countries was/is very different from the trend in the developed countries.

Method of aggregation

In developing the methodology for estimating the global changes, various methods were tested. Given

(i)   the differences in the trends of the changes between the developed and developing countries,

(ii)   the limited number of countries with current data (monthly or quarterly),

it was considered appropriate (a) to separately analyse developed and developing countries[2], and (b) to use the weighted median change across countries with data within each group, without any imputations for missing values, as a summary statistics for the distribution of these changes across countries.

The decision in (b) assumes that the changes in the countries without data, belonging to the same group, are so distributed across the weighted median of countries with data, that the latter would not be much different from the weighted median of changes for all countries in the group.

The weighted median is a measure of the central location of the distribution of changes that is more robust in the presence of extreme values than is the mean. Also the weighted median is more suitable than the mean for uses in situations where some values are not known since it is not necessary to impute the values of all these missing values to derive a value for it.

In order to determine the median for each group of countries, the changes in each country[3] are arranged in ascending order of magnitude. The figure for each country or area is weighted appropriately to determine the median of the changes across countries and areas. The weights represent each country's share in the total economically active population in that same group.[4] The median value obtained is considered as a summary measure of the distribution of changes in the labour markets in each of the two groups of countries.

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[2] The groups are based on UN classification of economic groupings available at http://unstats.un.org/unsd/methods/m49/m49regin.htm
[3] The number of countries with available data per indicator varies between 50 and 65, out of which about half are from the developing world.
[4] The ILO estimates of economically active population are available at http://laborsta.ilo.org.

Global estimates of the changes in the employment and unemployment levels are calculated as weighted means of the median changes in the developed and developing countries. The weights represent each group's share in the global work force[5] .

Aggregation by using imputed values

As we did not feel comfortable with basing an estimate of median change on only 16 countries with data for Jan 09[6] we have looked for an alternative to increase the number of points in Jan. 09 by imputing the missing values. The missing values for Jan.09 were imputed on the basis of the average month-to-month change for the last 6 months[7]. By applying this change to the Dec.08 value we estimated the value of the indicator for Jan.09. Then we corrected these imputed values for Jan.09 for the average[8] relative difference between observed and imputed values for countries with data for Jan.2009. These corrections were done separately for developed and developing countries.

The rest of the procedure for aggregating the national data into regional and global estimates was identical to the one described above (based on observed values only).

The final results were very different from regional and global estimates based on observed values only. The quality of the estimates based on imputed values was consider as less reliable because
   - The situation in the labours market has been changing very quickly and at the beginning of 2009 was much worse than the situation in the second half of 2008, in many countries;
   - The number of points with data in the second half of 2008 was limited to only one or two for countries with quarterly estimates. This makes the imputed values for Jan.09 very unreliable and sensitive to seasonal variations that may exist from one month/quarter to another.

Rather than using the average month–to-month changes for last six months for 2008 we considered the possibility of using the average month-to-months changes for the last 12 months. This idea was ruled out because the crisis started only in the second half of 2008 and using the average for 2009 would underestimate the level of indicators for Jan.09.

Sensitivity tests

Various tests were made to asses the quality and reliability of the estimates, including (i) differences between the estimates based on annual and on monthly data, (ii) differences between the medians based on a maximum number of monthly/quarterly observations and on observations for two thirds of the series, (iii) upper and lower limits of the median when the values for countries without data are imputed.

Additional tests were done by imputing the values for China and India based on the annual change in employment/unemployment.

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[5] The ILO estimates of economically active population are available at http://laborsta.ilo.org.
[6] No. of countries with data at the tame when the test was done.
[7] Average month-to-month changes were estimated by using arithmetic and geometric mean. There were no major differences between the two.
[8] Tests with mean, geomean and median were done.

The tests have shown that
- The global estimates based on the median for the countries with data are very similar to the ones based on all countries.
- The quality and reliability of the global estimates depend on the number of countries with data. The estimates are sufficiently reliable providing that the data for at least two thirds of the countries are available.
- The global estimates are for the last two months should be interpreted with caution. They may change significantly as more data become available[9]. The estimates for the previous periods may also be subject to minor revisions.
- Given the large number of developing countries without data[10], especially China and India, the estimates for the developing countries should be interpreted with caution.
- In the summary table, the estimates for Oct. and Nov are shown with a footnote highlighting the fact that, because of the limited number of countries with data for these two months, the estimates could change significantly and should be interpreted with caution. The solution may be to exclude estimates for the last one or two months from the summary table.

Some results and challenges

The global and regional estimates of employment and unemployment trends have been produced since Dec.08. The changes are estimated for the following series:
(i) unemployment (level and rate);
(ii) employment total, total and paid
(iii) employment in non-agriculture, total and paid;
(iv) employment in manufacturing, total and paid.
(v) CPI (all-items and food group).

All estimates, together with country data and some charts, are updated each month and disseminated on the ILO job crisis observatory website at www.ilo.org/jobcrisis.

The most recent global and regional estimates of employment and unemployment trends as well as trends in the CPI inflation are attached in Annex 1.

The web publication has been a subject to a number of improvements and additions, including introduction of (i) new topics (wages and hours of work), (ii) dissagregation of employment and unemployment data by sex, (ii) graphical presentation of changes over the same periods of the previous year, (iv) relative changes in employment/ unemployment over the same period of the pervious year, (v) historical series, etc.

The next challenge is to improve the methodology for estimating the changes in absolute level of employment and unemployment and for estimating the number of jobs lost. These have already been developed but are still subject to verifications.

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[9] Rather than excluding the estimates for the last two months from the summary table we have decided to show them with a footnote about their reliability. Although subject to revision they do reliably show the trend and the direction of the change.

[10] The data are available for about 30 developing countries comprising only 15% of the total economically active population in the developing world.

We are also trying to establish the relationship between the previous crisis and the changes in the labour market in order to predict the changes in the future. The analysis done on the historical series have shown that the changes in the employment levels, especially n the developing countries, are very similar to the ones in the post 2001 crisis.

More analysis on the impact of crisis on the situation of men and women in the labour markets are also expected.