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## EMPLOYMENT AND GROSS DOMESTIC PRODUCT

**COMPARISONS OF TRENDS AND PATTERNS: 2001-2006**  
(First of a series)



*This LABSTAT is the first of a series focusing on the issue of data coherence between employment statistics generated from the Labor Force Survey (LFS) and output or gross domestic product (GDP) as estimated in the National Income Accounts. This issue takes a closer look at the link between the two data series by comparing their trends or quarterly movements across time and sector over the six-year period 2001-2006.*

### Overview

Economic activity is often measured by statistics on gross domestic product (GDP) or the total output of goods and services produced within the country during a given period. Alternatively, it can also be measured by statistics on employment which comprises all persons that contributed to the production of the country's output. Both sets of statistics are available quarterly - the former from the National Income Accounts prepared by the National Statistical Coordination Board (NSCB), while the latter from the results of the Labor Force Survey (LFS) of the National Statistics Office (NSO).

Efforts have been made to facilitate the joint analysis of the two bodies of statistics by making their concepts consistent (ILO Manual on Concepts and Methods, 1990). Thus, employment in the LFS is defined in terms of production of goods and services as set forth by the United Nations System of National Accounts (SNA). This means that persons should be counted as economically active if (and only if) they contribute or are available to contribute to the production of goods and services falling within the SNA production boundary.<sup>1</sup>

While the two indicators are conceptually consistent in definition, their statistical measurements may differ in many other respects. Noteworthy is the difference in reference period for measuring GDP and employment in the LFS. GDP is an estimate of the "flow" of goods and services produced in the country over the quarter (i.e., the entire quarter). On the other hand, employment is an estimate of the "stock" of economically active population (employed and unemployed) at a particular point in time. It is being measured using a short reference period (i.e., past week). This difference in measurement has from time to time posed a problem of data coherence whenever results of the LFS contradict the outcomes of the National Income Accounts or vice versa.

This paper takes a closer look at the extent of convergence and divergence between the two data sets across time and across sectors. Data analysis, however, is limited to the six-year period 2001-2006 due to the "break" in the National Income

<sup>1</sup>Inclusions and exclusions in the SNA production boundary can be accessed in <http://unstats.un.org/unsd/sna1993/introduction.asp>.

Accounts data series. The break in the data series is a result of incorporated updates and revisions from data sources and refinements in methodology for some sectors beginning 2000.

## Trends and Patterns

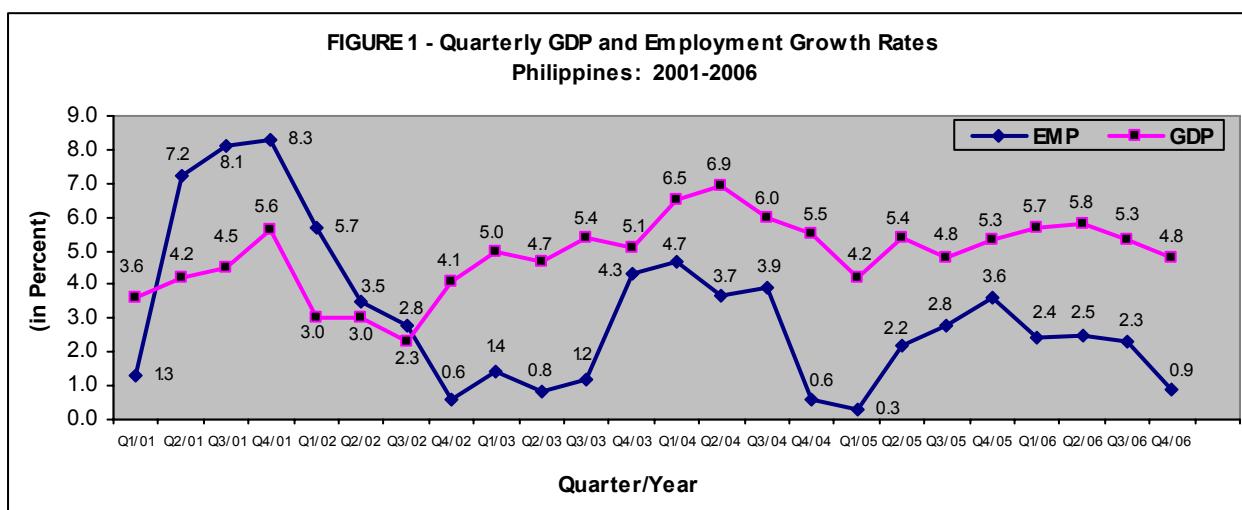
The country's domestic economy as measured by GDP expanded at an average rate of 4.6% annually between 2001 and 2006 as shown in Table 1. Over the same period, the total number of employed persons also grew but at a slower pace - 3.0% annually. It should be noted that this trend follows the global trend: employment and wages lagging behind economic growth and productivity (ILO, Global Employment Trends Brief, January 2006).

**TABLE 1 - GDP and Employment Annual Growth Rate, Philippines: 2001- 2006**  
(in percent)

| INDICATOR  | 2001 | 2002 | 2003 | 2004 | 2005 | 2006 | Average<br>(Geometric Mean) |
|------------|------|------|------|------|------|------|-----------------------------|
| GDP        | 1.8  | 4.4  | 4.9  | 6.2  | 5.0  | 5.4  | 4.6                         |
| Employment | 6.2  | 3.1  | 1.9  | 3.2  | 2.2  | 2.0  | 3.0                         |

*Sources of basic data: National Statistical Coordination Board, National Income Accounts.  
National Statistics Office, Labor Force Survey.*

Of particular importance to data users is the coherence between GDP and employment in terms of the direction of change across time. Comparing the movements of the annualized data revealed a generally contrasting pattern as there were more number of years that the two sets of data moved in opposite direction (2001-2002, 2002-2003 and 2005-2006) than in the same direction (2003-2004 and 2004-2005). Hence, an analysis of annual data series is not useful for this purpose.



On the other hand, the use of quarterly data produces a fairly good match in so far as the direction of change is concerned. This is because of the 24 growth points that comprised the 2001-2006 data series, 16 points or two-thirds moved in the same direction while only 8 points or one-third did not. This suggests that employment is strongly linked with the behavior of GDP, although there are other factors that can influence its movement such as the size and demographic characteristics of the labor force and labor force participation rate, among others.

### Statistical Test

To validate this observation, the two data sets were subjected to correlation and regression tests. The initial test-run using growth rates as data observations produced insignificant results for all three broad sectors. The second test-run using levels or actual data as observations yielded significant correlation coefficients and the correct signs for all three sectors as shown in Table 2. The results indicate a very high correlation between GDP and employment at the national level ( $r=0.874$ , significant at 0.01 level). The beta coefficient is positive ( $b=0.054$ ) confirming the movement of the two variables in the same direction most of the time.

Across sectors, the highest correlation coefficient was recorded by the service sector ( $r=0.910$ ) indicating a very good match between its output and employment, followed by industry sector ( $r=0.716$ ). The lowest, on the other hand, was noted for agriculture sector ( $r=0.662$ ). The correlation coefficients for all three sectors were significant at 0.01 level.

The correlation coefficient for the agriculture sector confirms the problem of data coherence often encountered in analyzing the link between agricultural output and employment. This could be attributed to the short-term and seasonal nature of agricultural production which at times makes it difficult to be captured in the LFS due to its short reference period. For this reason, some data users have been advocating the use of a longer reference period to adequately capture agriculture employment in the LFS. It can be recalled that this was done in the past when the LFS was based on a "past quarter" reference period i.e., from 1976 to 1986.

On the other hand, the stable nature or regularity of work that characterizes employment in the industry and service sectors could partly explain their high correlation coefficients which indicate a good match between employment and output. This also suggests that "past week" reference period is more appropriate in capturing the trend in employment for these two sectors.

**TABLE 2 - Correlation and Beta Coefficients: GDP and Employment (Levels)**

| <b>SECTOR</b>      | <b>Pearson<br/>Correlation<sup>1</sup></b> | <b>Beta Coefficient</b> |                |
|--------------------|--|-------------------------|----------------|
|                    |  | <b>Value</b>            | <b>t-value</b> |
| <b>All Sectors</b> | <b>0.874</b>                               | <b>0.054</b>            | <b>8.988</b>   |
| Agriculture        | 0.662                                      | 0.050                   | 4.417          |
| Industry           | 0.716                                      | 0.019                   | 5.126          |
| Service            | 0.910                                      | 0.063                   | 10.954         |

<sup>1</sup> Correlation coefficients for all sectors significant at 0.01 level.

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**TABLE 2a - GDP and Employment by Sector, Philippines: 2000-2006****GROSS DOMESTIC PRODUCTS**

(in million pesos, at constant price)

**ALL INDUSTRIES**

| <b>Year</b> | <b>1st Qtr</b> | <b>2nd Qtr</b> | <b>3rd Qtr</b> | <b>4th Qtr</b> | <b>Annual</b> |
|-------------|----------------|----------------|----------------|----------------|---------------|
| 2000        | 226,533        | 234,813        | 234,870        | 262,195        | 972,960       |
| 2001        | 234,711        | 244,788        | 245,452        | 276,764        | 990,042       |
| 2002        | 241,681        | 252,217        | 251,084        | 287,987        | 1,034,094     |
| 2003        | 253,672        | 264,189        | 264,671        | 302,539        | 1,085,072     |
| 2004        | 270,137        | 282,380        | 280,561        | 319,096        | 1,152,174     |
| 2005        | 281,574        | 297,712        | 294,063        | 336,123        | 1,209,473     |
| 2006        | 297,607        | 315,063        | 309,651        | 352,095        | 1,274,416     |

**AGRICULTURE**

| <b>Year</b> | <b>1st Qtr</b> | <b>2nd Qtr</b> | <b>3rd Qtr</b> | <b>4th Qtr</b> | <b>Annual</b> |
|-------------|----------------|----------------|----------------|----------------|---------------|
| 2000        | 47,743         | 44,637         | 42,192         | 56,119         | 192,457       |
| 2001        | 49,169         | 46,334         | 44,258         | 59,807         | 199,589       |
| 2002        | 51,964         | 47,380         | 44,488         | 63,322         | 207,480       |
| 2003        | 54,151         | 47,168         | 47,177         | 66,777         | 215,273       |
| 2004        | 58,531         | 49,648         | 50,505         | 67,928         | 226,612       |
| 2005        | 58,261         | 50,682         | 51,387         | 70,432         | 230,762       |
| 2006        | 60,472         | 54,238         | 53,685         | 71,762         | 240,158       |

**INDUSTRY**

| <b>Year</b> | <b>1st Qtr</b> | <b>2nd Qtr</b> | <b>3rd Qtr</b> | <b>4th Qtr</b> | <b>Annual</b> |
|-------------|----------------|----------------|----------------|----------------|---------------|
| 2000        | 77,528         | 81,027         | 85,426         | 88,277         | 345,041       |
| 2001        | 79,773         | 85,634         | 89,416         | 93,342         | 336,471       |
| 2002        | 79,170         | 86,301         | 89,582         | 93,624         | 349,508       |
| 2003        | 82,515         | 91,219         | 93,414         | 96,338         | 363,486       |
| 2004        | 86,205         | 95,949         | 95,669         | 102,719        | 380,542       |
| 2005        | 89,126         | 101,500        | 100,698        | 107,752        | 399,076       |
| 2006        | 94,250         | 107,140        | 105,491        | 111,328        | 418,209       |

**SERVICE**

| <b>Year</b> | <b>1st Qtr</b> | <b>2nd Qtr</b> | <b>3rd Qtr</b> | <b>4th Qtr</b> | <b>Annual</b> |
|-------------|----------------|----------------|----------------|----------------|---------------|
| 2000        | 101,262        | 109,149        | 107,252        | 117,799        | 435,462       |
| 2001        | 105,769        | 112,820        | 111,778        | 123,615        | 453,982       |
| 2002        | 110,547        | 118,536        | 117,014        | 131,041        | 477,106       |
| 2003        | 117,006        | 125,802        | 124,081        | 139,424        | 506,313       |
| 2004        | 125,400        | 136,783        | 134,386        | 148,450        | 545,019       |
| 2005        | 134,188        | 145,531        | 141,977        | 157,939        | 579,635       |
| 2006        | 142,885        | 153,684        | 150,475        | 169,005        | 616,049       |

**EMPLOYMENT**

(in thousands)

**ALL INDUSTRIES**

| <b>Year</b> | <b>January</b> | <b>April</b> | <b>July</b> | <b>October</b> | <b>Average</b> |
|-------------|----------------|--------------|-------------|----------------|----------------|
| 2000        | 27,733         | 27,209       | 27,093      | 27,775         | 27,452         |
| 2001        | 28,096         | 29,160       | 29,282      | 30,085         | 29,156         |
| 2002        | 29,705         | 30,186       | 30,104      | 30,251         | 30,062         |
| 2003        | 30,119         | 30,418       | 30,451      | 31,553         | 30,635         |
| 2004        | 31,547         | 31,533       | 31,632      | 31,741         | 31,613         |
| 2005        | 31,634         | 32,221       | 32,522      | 32,875         | 32,313         |
| 2006        | 32,377         | 33,024       | 33,257      | 33,185         | 32,961         |

**AGRICULTURE**

| <b>Month</b> | <b>January</b> | <b>April</b> | <b>July</b> | <b>October</b> | <b>Average</b> |
|--------------|----------------|--------------|-------------|----------------|----------------|
| 2000         | 10,622         | 9,845        | 9,855       | 10,401         | 10,181         |
| 2001         | 10,252         | 10,915       | 10,980      | 11,253         | 10,850         |
| 2002         | 11,006         | 11,025       | 11,144      | 11,311         | 11,122         |
| 2003         | 11,150         | 11,155       | 10,831      | 11,741         | 11,219         |
| 2004         | 11,174         | 11,113       | 11,450      | 11,785         | 11,381         |
| 2005         | 11,359         | 10,993       | 11,990      | 12,171         | 11,628         |
| 2006         | 11,822         | 11,420       | 11,841      | 12,164         | 11,812         |

**INDUSTRY**

| <b>Month</b> | <b>January</b> | <b>April</b> | <b>July</b> | <b>October</b> | <b>Average</b> |
|--------------|----------------|--------------|-------------|----------------|----------------|
| 2000         | 4,400          | 4,542        | 4,430       | 4,444          | 4,454          |
| 2001         | 4,682          | 4,786        | 4,701       | 4,682          | 4,712          |
| 2002         | 4,596          | 4,820        | 4,694       | 4,669          | 4,695          |
| 2003         | 4,582          | 4,860        | 4,970       | 4,948          | 4,840          |
| 2004         | 5,050          | 5,130        | 4,933       | 4,880          | 4,998          |
| 2005         | 4,977          | 5,236        | 4,999       | 4,883          | 5,024          |
| 2006         | 4,882          | 5,237        | 5,009       | 4,895          | 5,006          |

**SERVICE**

| <b>Month</b> | <b>January</b> | <b>April</b> | <b>July</b> | <b>October</b> | <b>Average</b> |
|--------------|----------------|--------------|-------------|----------------|----------------|
| 2000         | 12,708         | 12,816       | 12,796      | 12,925         | 12,811         |
| 2001         | 13,161         | 13,458       | 13,600      | 14,151         | 13,592         |
| 2002         | 14,104         | 14,341       | 14,266      | 14,271         | 14,246         |
| 2003         | 14,388         | 14,405       | 14,648      | 14,865         | 14,577         |
| 2004         | 15,322         | 15,290       | 15,250      | 15,076         | 15,235         |
| 2005         | 15,296         | 15,991       | 15,534      | 15,820         | 15,660         |
| 2006         | 15,671         | 16,366       | 16,407      | 16,126         | 16,143         |

Note: GDP details may not add up to total for the period 2000-2001 due to some adjustments in the annual total figures.  
Basic Source of Data: National Statistics Office (NSO) and National Statistical Coordination Board (NSCB).