Research Summaries

Aggregate export price comparisons developed for U.S., Germany, Japan

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In February 1986, the Bureau of Labor Statistics began producing aggregate export price index comparisons between the United States and Japan and the United States and Germany on a quarterly basis. Previously, BLS had been producing export price index comparisons only for detailed commodity categories.

Export price comparison measures are ratios of the foreign export price indexes in dollar terms to specially calculated U.S. export price indexes. The measures, in index form, are designed to show relative price movements between the United States and Germany and the United States and Japan for designated market baskets of products.

An increase in a comparison index represents an increase in the price of the foreign export basket of goods compared to the U.S. price of an export basket consisting of the same volume and similar types of commodities. The opposite is true in the case of a decrease in an index. Changes in relative price movements are of interest because of their influence on changes in relative export quantities.

Comparison measures are calculated by first translating the foreign export price indexes into dollar terms and then dividing these indexes by the special U.S. export price indexes matching the foreign export categories.[1] The exchange rates used in converting the foreign price indexes to dollar terms are monthly averages of certified noon buying rates in New York as published by the Federal Reserve Board.[2]

The indexes for periods in which different export value weights were used have been linked together. The German-U.S. export price index comparisons use 1970 German export value weights from June 1970 through March 1976; 1976 weights from June 1976 through December 1979; and 1980 weights from March 1980 to the present. The Japan-U.S. export price index comparisons have been calculated using 1975 Japanese export value weights from June 1970 through December 1979, and 1980 weights from March 1980 to the present.

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The comparison measures have been aggregated according to foreign country export trade weights in order to match the classification systems of the published foreign export price indexes.[3] Other weighting schemes, such as the use of U.S. export trade weights or world trade weights, would produce different results. Aggregating according to other weighting schemes would require access to price data for individual export commodities from Germany and Japan which are not available at the present time.

German export price indexes are published by the Statistisches Bundesamt [Federal Statistical Office] of the Federal Republic of Germany in the monthly publication, *Preise und Preisindizes fuer die Ein- und Ausfuhr* [*Prices and Price Indexes for Imports and Exports*]. The German export price indexes used in the comparison measures are taken from table 2.6 for the detailed product categories and from table 2.5 (SITC, Rev. II) for the aggregate categories. Currently, Germany calculates its export price indexes from approximately 6,100 individual export price series. These prices refer to export transactions concluded during the reporting month for specified commodities on an F.O.B. (free on board) German border basis, and are adjusted for quality changes. Individual price relatives are aggregated by means of the Laspeyres formula using export value weights.

The Japanese export price indexes used in the comparison measures are taken from Section II, table 3 of *Price Indexes Monthly*, published by the Bank of Japan. This table contains 319 export categories at different levels of aggregation. Approximately 530 export prices are surveyed by the Bank of Japan on a monthly basis. These prices are contract prices on an F.O.B. port basis and are adjusted for quality changes. The individual price relatives are aggregated as above using Japanese export value weights.

The specially constructed U.S. export price indexes used in the comparison measures have been designed to match the commodity coverage of the German and Japanese published export price indexes. The price series used in these indexes have been selected from approximately 7,700 export prices collected from U.S. exporters by the Bureau of Labor Statistics' International Price Program. The prices collected are either F.O.B. or F.A.S. (free alongside ship) transaction prices which are adjusted for quality changes. The individual price relatives are aggregated by means of the Laspeyres formula using the respective foreign export trade weights.

The Statistisches Bundesamt, producer of Germany's export and import price indexes, has furnished BLS with a table of weights and subclassifications within its published export price index categories. By using this information along with the description of Germany's Commodity Classification for Industrial Statistics (WI),[4] it was possible to select export products collected by the BLS International Price Program which were judged to be similar to the products represented in the German published series. A similar procedure was used for the correct classification of U.S. products within the Japanese classification scheme. The Bank of Japan supplied BLS with a complete listing of product specifications used in the production of Japanese export price indexes. From this listing it was possible to construct special U.S. export price indexes with comparable commodity coverage.[5]

In regard to product coverage, it should be noted that the BLS export price data base is a sample designed to represent U.S. export price trends at the level of 4- or 5-digit SITC (Rev. II) product categories. Although a selection of export prices from this data base has been used to produce the special U.S. export price indexes for the comparison measures, the product samples were not originally drawn for this purpose. However, the mappings of products to foreign export categories have been thoroughly examined to ensure the fullest product coverage possible.[6] □

FOOTNOTES

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1 FXPI*ER/USXPI, where FXPI is a foreign published export price index series; ER is the exchange rate; and USXPI is the U.S. export price index calculated to match the commodity coverage of the foreign published index series.

2 Data are published monthly in the *Federal Reserve Bulletin*; and *Statistical Release G.5: Foreign Exchange Rates* (Board of Governors of the Federal Reserve System).

3 Three levels of aggregation above the detailed commodity level were developed for Germany, and four levels were developed for Japan.

4 *Systematisches Warenverzeichnis fuer die Industriestatistik*, Ausgabe 1975 [*Commodity Classification for Industry Statistics*, 1975 Edition] (Wiesbaden, Statistisches Bundesamt, 1976).

5 "List of Commodity Descriptions of 1980-Based Price Indexes" (Tokyo, The Bank of Japan, Statistics Department).

6 *Comparisons of United States, German, and Japanese Export Price Indexes*, Bulletin 2046 (Bureau of Labor Statistics, 1980).

Research Notes

Measuring wage premiums for job risks

During the past 10 years, a large amount of research has been devoted to measuring the wage premiums which workers receive as a result of bearing additional occupational injury and illness risks. Improved estimates of the premiums are of value for policy evaluation because they are used to assess the benefits of proposed occupational safety and health regulations.

The motivation for this research is the idea that, in general, if a worker has a choice between two jobs of different riskiness, he will choose the riskier one only if it pays a sufficiently higher wage. The wage premium for bearing extra risk is known as a compensating wage differential, because the premium is viewed as being paid to compensate for the additional riskiness. A compensating differential should not be confused with workers' compensation benefits. The former is paid as a component of wages, while the latter is an indemnity benefit paid only if a worker is injured. They are related, however, in that both are paid to compensate a worker for the costs he bears in the event of an injury or illness.

Research on measuring compensating differentials endeavors to explain observed variations in wages by means of an equation which relates worker and job characteristics to wage levels. Let W represent the wage level, X represent worker and job characteristics known to affect wages, such as education or experience, and let R represent the riskiness of a job. It is hypothesized that wages are related to X and R through the equation

$$W = a + bX + cR$$

where b and c are coefficients which indicate by how much wages change with unit increases in X and R. For example, suppose that R measures the number of injuries and illnesses incurred by 100 workers in 1 year, that W measures weekly wages, and that c has a value of 5. Then the equation indicates that an increase in the riskiness of a job of 1 case per 100 workers per year is associated with an increase in weekly wages of $5. The object of empirical work on compensating differentials is to obtain better estimates of c from data sets containing information on wages and worker and job characteristics.

In a recent paper, we examine two issues in the measurement of compensating differentials. First, we study to what extent the differentials differ for men and women and for union and nonunion workers. Second, we analyze the impact of including a measure of workers' compensation benefits in the wage equations used to estimate the differentials.

The primary source of the data was a sample of private nonagricultural blue-collar and service workers drawn from the May 1980 Current Population Survey. Separate wage equations were estimated for union men, nonunion men, union women, and nonunion women. Standard education, experience, and demographic characteristics were included as X variables in the wage equations. In addition, two measures of job risk and a measure of workers' compensation benefits were included as variables explaining wage variations. The job risk variables, obtained from the Bureau of Labor Statistics' 1980 Annual Survey of Occupational Injuries and Illnesses, measure the number of lost workday injury and illness cases per 100 full-time workers and the number of lost workdays per lost workday case. These measure the frequency and severity of injury and illness cases by industry, respectively. The workers' compensation variable measures the proportion of weekly wages replaced by total temporary disability benefits. It was imputed from information on the workers' weekly wages and characteristics and the State laws regarding benefit payments.

Three principal conclusions emerge. First, there is strong evidence of compensating wage differentials for both union and nonunion men. Men receive higher pay to work at riskier jobs; for women, however, the evidence is not as conclusive. Only female union members appear to receive higher wages for riskier jobs, and even here the evidence is not as strong as for men. It is conceivable that the lack of evidence for women suggests that they indeed do not receive wage premiums for job risk. It is equally possible, however, that the poor results for women suggest that the industry job risk variables, which are not available by sex, do not adequately represent the job risks faced by female employees of high-risk industries. Women tend to be underrepresented in these industries and, within them, they tend to work in the low-risk occupations.

A second finding of the research is that, everything else being the same, an increase in the proportion of wages replaced by workers' compensation income benefits leads to a drop in the wage level. This result is stronger for women than for men. A final surprising result is that the inclusion of the workers' compensation benefit variable in the wage equations has no effect on estimated compensating wage differentials. Also, coefficients on the interaction of workers' compensation benefits with the risk variables are generally statistically insignificant.

The study and its results are described in full in the paper "Workers' Compensation Benefits and Compensating Wage Differentials," by John W. Ruser, BLS Working Paper No. 153.—*John W. Ruser, Office of Research and Evaluation, Bureau of Labor Statistics.* □

Interview group bias

In the Current Population Survey, like many data sets used in studies of labor force behavior, respondents are interviewed repeatedly. Previous research has shown that responses systematically differ with the number of times that individuals are interviewed. With the current and growing emphasis on dynamic models of labor force behavior and the increasing use of panel data, it is important to examine the quality of the data and potential survey response error that can be confounded with the measurement of systematic changes in behavior over time.

Empirical estimates of time-related bias in the Current Population Survey (CPS) have grouped together all respondents who enter the sample at the same time. In the CPS, these groups are referred to as rotation groups. This procedure requires the implicit assumptions that respondents never miss interviews and that there is no mobility in and out of the sample. If these assumptions are not supported by the data, they can lead to significant underestimates of time-related effects on reported labor force status.

Microdata from the CPS are used to provide empirical evidence of the effects of repeated interviewing on survey responses. Using 3- and 4-month matches of three different rotation groups from the CPS, we found that a substantial number of respondents have not been surveyed in every month. Respondents who have been interviewed the same number of times are classified as members of the same interview group. Estimates of the magnitude of bias within these rotation groups of the CPS show that the unemployment rate for respondents interviewed for the first time can be more than 50 percent higher than for respondents interviewed for the fourth time. The paper includes a discussion of the relative importance of rotation group bias and interview group bias in the CPS and concludes that interview group bias can explain the patterns of rotation group bias commonly observed. While this research focuses only on the CPS, the same types of problems may arise in any panel data set.

The study and its results are described in full in the paper "Interview Group Bias: Effects of Repeated Interviewing on Estimation of Labor Force Status," by Janice Shack-Marquez, BLS Working Paper No. 154.—*Janice Shack-Marquez, Office of Research and Evaluation, Bureau of Labor Statistics.* □