Labor costs in India's organized manufacturing sector

Compensation costs in India's organized manufacturing sector were 91 cents per hour for all employees in 2005; this amounted to about 3 percent of hourly labor costs in the U.S. manufacturing sector, but was above BLS estimates of labor costs in China

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India's important role in the global economy is perhaps best exemplified by its membership in the G-20, the group that has replaced the G-8 as the major international economic forum. Although India is the fourth-largest economy in the world, accounting for 4.6 percent of the world's GDP, the value of India's exports in 2007 was only 1 percent of the world's total exports.[1] Many factors affect the level of a country's exports and the growth of its GDP. The Government of India's National Manufacturing Competitiveness Council has identified manufacturing as "the main engine for economic growth and creation of wealth" for the country.[2] Currently, the Council believes that India's export levels are far below its potential. India has been identified as a potential manufacturing giant by outsiders, as well, and has generated interest in the global marketplace because of its low cost of labor and large population.

Because of India's economic prominence, and in light of BLS's history of providing comparative statistics, BLS has undertaken a research project to study the manufacturing industry in India, supported by the expertise of coauthors Haub and Sharma. This article presents, for the first time, BLS estimates of compensation in India's "or-

ganized" manufacturing sector—the portion of the country's manufacturing activity that is formally registered with Indian state governments, making it subject to regulation. BLS estimates that in 2005, the latest full year for which data were available at the time this article was written, employers in India's organized manufacturing sector compensated employees at a mean rate of $0.91 an hour—approximately 3 percent of the compensation level of manufacturing employees in the United States. (All averages referred to in this article are means.)

This article describes the Indian manufacturing industry and the differences between the organized and unorganized sectors. However, it focuses primarily on the organized manufacturing sector. This sector produces over two-thirds of India's manufacturing output, and the firms in this sector are more comparable to enterprises in advanced countries than are firms in the unorganized sector.[3] The article also discusses India's statistical system, features of the available Indian manufacturing industry data, the procedure used by BLS to estimate hourly compensation, and compensation trends both in all manufacturing and in 18 industries within manufacturing. Lastly, it addresses the commonly made comparison

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of Indian and Chinese manufacturing.

Background

The Bureau of Labor Statistics calculates and publishes hourly compensation costs in manufacturing for all employees in 32 countries and for production workers in 34 countries.[4] In recent years, BLS has added emerging economies to these two series, which previously had contained only data from developed countries. Although India has been recognized among developing economies for the abundance and quality of its statistics, compensation estimates for India's manufacturing sector cannot yet be incorporated into the main BLS comparative compensation series because of limitations such as a lack of timely data publication, absence of data on recorded work hours, and a likelihood of many businesses reporting innacurate data. Instead, BLS hopes to present data for India as a special supplemental series—an approach similar to that used for China, another country for which BLS has identified a number of data quality issues, and a country to which India is often compared.[5] Because these two countries have become important forces in the global economy, there is value in studying the compensation data for both countries, to the extent possible.

This article presents, for the first time, BLS estimates of compensation in the organized sector on an estimated hourly basis in Indian rupees and in U.S. dollars for the period from 1999 to 2005. The limitations of the estimates also will be discussed. The analysis in this article uses information published by India's national statistical organizations, the primary source being the Indian Annual Survey of Industries (ASI), which collects employment and compensation data for the country's organized manufacturing sector.

The Indian statistical system

Unlike most developing countries, India has a long history of conducting surveys and maintaining statistics, and its systems have evolved and remained relevant to changing economic and political conditions. Statistical systems in India can be traced back as far as the fourth century BC, when rulers maintained information on population, land, and agricultural production primarily to serve their own needs. In general, data collection was neither highly developed nor well coordinated until after India gained its independence in 1947, when the need for more advanced economic planning arose.[6] By the early 1950s, the country had established the Central Statistical Organisation (CSO), which coordinates the state statistical offices, and the National Sample Survey Organisation, which conducts large-scale sample surveys.[7] These two entities are currently housed under the Ministry of Statistics and Programme Implementation.

In the 1990s, India's government and its markets underwent changes that put new pressures on the statistical system. The closed economy, driven fundamentally by public sector activity, began opening up and relying more heavily on the private sector. In January of 2000, the government created a formal body—the Rangarajan Commission—to review the statistical system and all the official statistics it produces.[8] In response to the group's recommendations, India has been working to create a system that is more centralized, consistent, timely, credible, and reliable. One major initiative is the India Statistical Strengthening Project, which calls for creating and maintaining a national business register to allow for more scientific periodic business surveys, improve the training of employees who work with statistics, and increase resources available to the states.[9] The experience and history that India has with

Publication of data from India

The Bureau of Labor Statistics has been a leader in compiling international comparisons of hourly compensation of manufacturing employees over a wide range of countries. Despite its large and growing importance in world manufacturing, India has not been included in the comparisons because of difficulties in obtaining and interpreting that country's data and because of concerns about the quality of the data. Although this *Monthly Labor Review* article greatly facilitates understanding of Indian compensation statistics, many problems with data availability, coverage, and reliability remain, as described in the article. Therefore, the Bureau does not plan to include India in its regular comparisons of hourly compensation costs at this time. This article is intended as the first step toward developing the measures necessary to include India in the regular comparisons series that currently comprises 36 countries. Because of the difficulties in creating hourly compensation estimates for India, the short-term plan is to publish updates for this country, with appropriate annotations, separate from the regular series of international comparisons of hourly compensation. This is similar to how BLS treats hourly compensation estimates developed for China. The final goal of moving India and China into the regular comparisons series would, of course, remain intact.

respect to collecting data increases BLS's confidence in the credibility of the Indian statistical system as a reliable source of data and information. Still, India acknowledges opportunities for improvement and a need to respond to its rapidly changing economy.

Organized sector versus unorganized sector

Although detailed data are available for India's organized sector, they are less plentiful for India's unorganized sector. Understanding how these two sectors differ is important in analyzing India's labor statistics.

India's organized and unorganized sectors generally correspond with what economists call the formal and informal sectors in other countries.[10] The official distinction between the organized and unorganized sectors lies in whether businesses register with the government and regularly maintain prescribed records. According to the National Accounts Statistics for India, the organized sector comprises enterprises for which statistics are available from budget documents, reports, or other such documents. In contrast, the unorganized sector refers to those enterprises whose activities or collection of data is not regulated under any legal provision or enterprises that do not maintain any regular accounts.[11] Not surprisingly, there are relatively few data series that cover the unorganized sector. Individual establishments tend to be small, typically employing fewer than 10 persons, and many of these "enterprises" have no hired workers and operate primarily for family sustenance.

The two sectors also differ in how they contribute to India's thriving manufacturing industry, which accounted for approximately 16 percent of India's real GDP from 2000 to 2006.[12] When measured by output, the organized sector dominates, producing approximately two-thirds of the country's manufacturing output.[13] The organized sector's average annual rate of growth was stronger than that of the unorganized sector, 13.1 percent compared with 9.9 percent. When measured by employment levels, however, the unorganized sector dominates. According to estimates from national data, close to 80 percent of manufacturing employees work in the unorganized sector.[14] From either perspective, the unorganized sector must be regarded as an important part of Indian manufacturing, and BLS is currently conducting additional research on it. This article's primary focus, however, is the organized manufacturing sector.

The Annual Survey of Industries

The ASI collects employment and earnings data from the organized manufacturing sector for all employees and for production workers for each fiscal year, which in India runs from April 1 to March 31.[15] Although the survey has been conducted since 1960, the BLS hourly compensation costs series for India's organized manufacturing sector does not begin until 1999, primarily because of industry classification changes that occurred before that year and would have compromised historical comparisons.

Beginning with the ASI of 1998–99 (which is survey notation for the fiscal year from April 1, 1998 to March 31, 1999), data were classified according to the National Industrial Classification (NIC) of 1998, which is based on the International Standard Industry Classification system (ISIC Rev.3). In 2004, the NIC was modified, and its changes were captured in the ASI of 2004–05 (henceforth "ASI 2004–05"). However, BLS analysis shows that the differences between NIC 1998 and NIC 2004 do not affect year-over-year comparisons between the BLS estimates for ASI 2004–05 and those for previous survey periods. Ultimately, BLS adjusts the Indian manufacturing data to make them comparable with data that were calculated in a manner consistent with the North American Industry Classification System (NAICS).

The ASI is conducted every year by mail and covers 31 of the 35 states and union territories that make up India. The four areas not covered likely have little impact on measurement because of their small size.[16] Because the survey frame includes all establishments that have registered with the Indian states, the ASI sample is believed to be representative of the organized manufacturing sector.[17] Although the data are thought to be characteristic of firms in the organized sector, there are important caveats. ASI survey data are presented in raw form without adjustments to the ways that employers reported them; there are no attempts to contact employers to fill in missing or incomplete data or to correct for data that seem out of line with other data. In addition, although participation is compulsory by the Collection of Statistics Act of 1953, penalties for noncompliance are not enforced frequently.[18] Because of the problem of nonresponse and because no attempt is made to impute values for employers that do not respond, the results are dependent upon which establishments return the survey questionnaire. These problems cause the data to be less reliable than survey data that are adjusted by the receiving statistical agency, or data that are weighted to be representative of the entire survey population.

The ASI covers manufacturing activities as defined by the Indian Factories Act as any of the following five processes:

(i) "making, altering, ornamenting, finishing, packing, oiling, washing, cleaning, breaking up, demolishing or otherwise treating or adapting any article or substance with a view to its use, sale, transport, delivery or disposal; or

(ii) pumping oil, water, or sewage; or

(iii) generating, transforming or transmitting power; or

(iv) composing types for printing by letter press, lithography, photogravure or [a] similar process, or binding [books]; or

(v) constructing, reconstructing, repairing, refitting, finishing or breaking up ships or vessels."[19]

The manufacturing sector is defined differently in the BLS hourly compensation series. Under the 2007 NAICS, manufacturing "comprises establishments engaged in the mechanical, physical, or chemical transformation of materials, substances, or components into new products."[20] The assembling of component parts for manufacturing is considered manufacturing, except in cases in which the activity is classified in construction. In order to reconcile hourly compensation costs calculated by use of the NAICS definition of manufacturing with those calculated by use of the ASI definition, BLS must remove from the raw Indian data all publishing activity as well as industries engaged in items (ii) and (iii) of the Factories Act definition of manufacturing.[21]

Data features

Knowledge of ASI data reporting practices and the salient features of the ASI data are important to understanding the estimates presented in this article and their limitations. Trends in employment, including the growth of contract labor in the organized manufacturing sector, will be discussed, as will the lack of data on payment for overtime work. As noted earlier, ASI data are reported as they are collected and are not weighted to represent India's entire organized manufacturing sector. The results are based

on whichever factories respond to the survey in any given year. General trends can be compared across years for all of manufacturing and for subsectors within manufacturing, but ASI data on industries with 4-digit NIC codes generally are not comparable from one year to the next.

The growth of contract labor.   In 2005–06, the most recent fiscal year for which data from the ASI are available, 8.7 million people were covered in the survey and reported as employed in India's organized manufacturing sector.[22] (See table 1.) As mentioned earlier, there are difficulties in estimating trends in employment by use of data from the ASI because the survey results are not representative of the entire organized manufacturing sector. The National Sample Survey Organisation does not publish response rates, and, as mentioned earlier, data from the ASI are not adjusted to account for nonresponse.[23] Despite these limitations, it is possible to discern from the data that some changes in the makeup of the Indian organized labor force are occurring.

BLS produces data for two groups of people in its international series on hourly compensation in manufacturing: all employees and production workers.[24] Production workers are defined as those employees who are engaged in fabricating, assembly, and related activities; material handling, warehousing, and shipping; maintenance and repair; janitorial and guard services; auxiliary production; or other services closely related to the aforementioned activities. Working supervisors generally are included; apprentices and other trainees generally are excluded. The category all employees comprises production workers as well as other workers employed full time or part time in an establishment during a specified payroll period. Temporary employees are included. People are considered employed if they receive pay for any part of the specified pay period. Unpaid family workers, workers in private households, and the self-employed are excluded. Typically, contract workers are excluded from BLS estimates of hourly compensation, but for India, contract workers are

Table 1. Employment in India's organized manufacturing sector, 1998–2006								
[Numbers in thousands]								
Type of employees	**1998–99**	**1999–2000**	**2000–01**	**2001–02**	**2002–03**	**2003–04**	**2004–05**	**2005–06**
All employees..	8,317	7,857	7,634	7,400	7,590	7,518	8,064	8,688
All production workers..	6,174	6,049	5,933	5,757	5,961	5,887	6,373	6,893
Directly employed..	5,213	4,857	4,725	4,507	4,591	4,440	4,685	4,920
Employed through contractors......................	960	1,192	1,208	1,249	1,369	1,447	1,688	1,973
Employees other than production workers.................	2,143	1,808	1,702	1,643	1,629	1,631	1,691	1,800

SOURCE: BLS estimates made by use of Annual Survey of Industries data from the Central Statistical Organisation of India.
NOTE: Data are not as originally published. Industries were removed to make data comparable with estimates that were calculated in a manner consistent with NAICS. Because of rounding, some sums of components do not equal their respective totals.

included in both the production workers and all employees series because their wages are reported together with the earnings of other workers and cannot be separated.

According to ASI 2005–06 data, production workers accounted for 79.3 percent of all employment in the organized manufacturing sector in India, an increase of approximately 5 percentage points from 1998–99, when production workers accounted for 74.2 percent of total organized manufacturing sector employment. (See chart 1 for information on the structure of employment). This increase in production workers' share of employment was driven by an increase in the number of contractors employed as production workers in the organized manufacturing sector—a number that more than doubled over the period in question. In 1998–99, contract workers accounted for only 15.6 percent of the employment of production workers; by 2005–06, contract workers accounted for 28.6 percent of production workers' employment. The increase in the proportion of contract workers in the organized manufacturing sector has likely helped keep overall labor costs lower over the period in question because employing contract workers is a legal way for employers to avoid many of the costs associated with hiring workers directly, such as the costs of social insurance and paid vacation.

The use of contract labor has been cited as a global trend and a phenomenon by which, according to Amit K. Bhandari and Almas Heshmati, workers earn lower wages and also are "deprived of benefits like health, safety, welfare and social security."[25] Bhandari and Heshmati found that,

in the Indian labor market, workers continue to accept these types of job arrangements because they tend to prefer secure employment to employment opportunities that are less secure, even if the less secure opportunities are potentially more lucrative. It is likely that large growth in the number of contracted production workers has caused the average compensation estimates published here for both production workers and all employees to be lower than they otherwise would be. Earnings of contract workers are included in the earnings data for all workers, but the ASI does not publish separate earnings data for contract workers. Therefore, it is not possible to determine directly the effect of contract work on earnings in India.[26]

Hours, part time, and overtime. BLS needs data on the number of hours that employees worked, as well as information on employers' practices as regards compensating employees. BLS estimates assume a 6-day, 8-hours-per-day workweek on the basis of research and interviews, as described in the following paragraphs.

In the ASI, wages are based on gross amounts paid to workers in general; no distinction is made between wages paid to full-time workers and wages paid to part-time workers. This is a common limitation of earnings and compensation data across countries. Additionally, because regular-time earnings and overtime earnings are combined when they are reported, average wage data include the effect of an unknown number of overtime hours, which may be paid at a higher rate. Overtime is common

Chart 1. Structure of employment in India's organized manufacturing sector
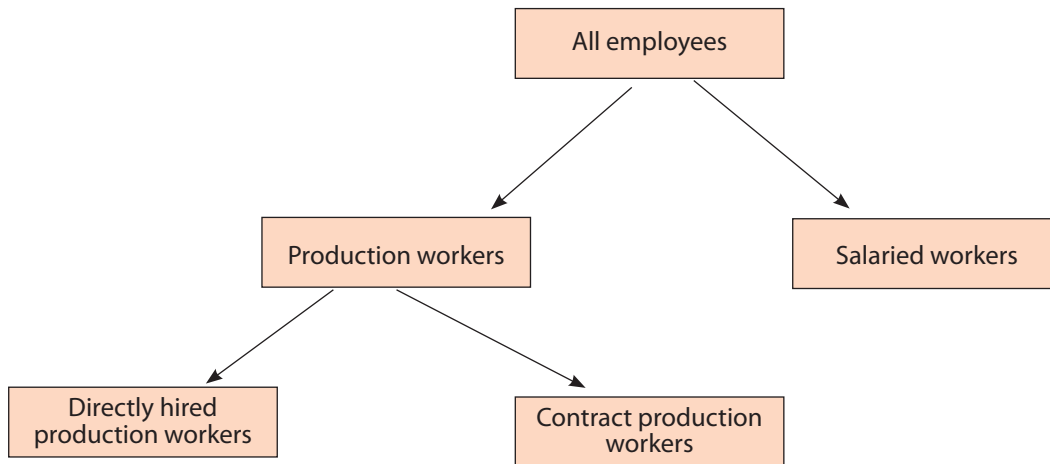
in Indian manufacturing, but no data on actual overtime hours are available. Government regulations in India stipulate that workers be paid twice their regular earnings for each hour of overtime worked.[27] However, it is not clear how many workers in the manufacturing industry actually receive this increased wage for their overtime hours. For those who do receive it, it is not clear whether they receive the full amount to which they are entitled or only some fraction of it.

The practice of ignoring regulations regarding hours worked and overtime and the practice of using contract labor to circumvent paying required amounts are widespread in India; fortunately, some employers were willing to provide information on an anonymous basis during personal interviews and through a small, independent survey of manufacturing establishments administered by coauthors Haub and Sharma in Faridabad, Haryana state, an industrial suburb of Delhi, in July 2006 specifically for this article.[28] A branch supervisor of a private printing firm provided information on common practices.[29] At his firm, the normal workday is 8 hours, with overtime worked as needed. He stated that his firm and others with which he is familiar pay an overtime rate that equates to the amount required by law, 2 times salary, but added that he was also aware of printers who pay less than the legally required rate. He noted that most employment contracts are arrived at orally, are typically cash transactions, and that the records kept by employers do not always reflect reality.

The supervisor also noted that 50 percent of workers at his firm were contract labor, a high proportion, and that the hours worked "do not matter" (meaning that a person's salary will be the same whether he or she works regular hours or long hours). Work that is somewhat irregular in nature is often contracted, and most contracted work is not regulated. Employers and contracted workers negotiate a specific job, and the workers are paid a lump sum for the work, regardless of the number of hours the job eventually takes.

During other interviews, respondents provided less specific information, but one theme was expressed repeatedly—enforcement difficulties are compounded by employee connivance in circumventing hours and overtime pay regulations. Employees frequently wish to work additional hours and to earn more than the standard hourly rate doing so, but employers often point out that they can simply hire additional workers who are happy to work at the regular rate because there is a large number of workers competing for jobs. As a result, workers who work beyond the standard number of hours usually do not receive the proper overtime pay, if they receive any additional pay at all. Overall, the respondents did report that a 6-day, 8-hours-per-day workweek is the common practice, which is in line with the hours estimate used in the BLS calculations.

It is important to consider these cultural practices and data nuances when one interprets the hourly compensation figures presented in this article. The increase in contract labor has likely suppressed the average hourly cost of compensation in Indian manufacturing over time. Additionally, it is not clear how much work is occurring "off the books." The addition of pay for work done beyond the number of hours in a standard workweek could cause the average hourly compensation estimate to be slightly inflated since those additional hours worked are not included in the BLS estimates (and the pay for those hours would be estimated at a higher rate). Although earnings, hours, and employment that are not documented by employers likely affect the hourly compensation estimates presented in this article, no adjustments have been made because the magnitude of the unrecorded data is not known. BLS estimates are based on the data as they are reported in the ASI.

Lastly, there are a number of inconsistencies in the ways factories respond to some survey items in the ASI, which reduces the level of detail that can be shown in the survey reports. For example, although the ASI questionnaire includes columns titled "contribution to provident & other funds," "workman & staff welfare expenses," and "bonus," all broken down by type of worker, a substantial number of respondents simply write in a lump sum for all workers. The Indian term for this practice in reporting data is "clubbing," and, when it occurs, only aggregate expenses for all employees are reported. For the BLS estimates, this does not present a problem. In the BLS hourly compensation series, data on the structure of labor costs for all employees are frequently used to estimate the corresponding values for production workers.[30] This common practice was adopted because of a lack of detailed data on production workers for many countries. BLS analysis has shown that in the manufacturing sector data on the structure of labor costs for all employees tend to be similar with those for production workers.

Hourly compensation estimation procedures

BLS comparative measures of hourly compensation costs include both data on hourly direct pay (which comprises pay for time worked, pay for vacations and holidays, bonuses, in-kind pay, and other premiums) and data on employers' social insurance expenditures and other labor

taxes (a category that comprises employers' expenditures for legally required insurance programs and contractual and private benefit plans, as well as other taxes on payrolls or employment).

The concept of earnings as reported in the ASI for all employees is nearly equivalent to the BLS concept of total direct pay, except that there are no estimates of pay in kind in the ASI data.[31] The ASI also reports data on social insurance, such as employers' contributions to the provident fund and other funds, and workmen and staff "welfare" expenditures (that is, additional expenditures that promote the general well-being of employees.)[32]

In addition to earnings data, a measure of the number of days or hours worked by employees in manufacturing is needed to calculate hourly compensation. The ASI does not report the number of days or hours worked in manufacturing, but does report the number of "man-days." Man-days are days both worked and paid for during the accounting year. The number of man-days is calculated by summing the number of paid employees working during each shift over all the shifts worked on all days. Man-days include only days on which employees actually worked; because of how they are defined and recorded by employers, man-days do not include days for which employees were paid but on which they did not work, such as vacation days and holidays.

Total hourly compensation can be obtained by a simple division equation. The numerator is the sum of total direct pay, or earnings (including bonuses), and social insurance as reported in the ASI. The denominator is aggregate hours worked, which is equal to man-days as reported in the ASI multiplied by the estimated number of hours worked daily. In order to estimate average hourly earnings, the average number of hours worked daily is necessary. Unfortunately, no data on hours worked are collected in the ASI or from any other national source. Coauthors Haub and Sharma thus solicited information from the CSO on typical working practices in India's organized manufacturing sector, conducted interviews with employers in Delhi, and conducted the aforementioned survey in Faridabad in July 2006.[33] All three of these sources indicated that a 6-day workweek lasting from 10 a.m. to 6 p.m. is very common. BLS thus estimates average daily hours worked at 8.[34]

To better understand ASI data on compensation in India's organized manufacturing sector, BLS created estimates of components of compensation not already reported in the ASI: pay for time worked and pay for time not worked (pay for vacation days and holidays). Having data on the various components of compensation and how they change over time allows for a greater understanding of the trends

in compensation and what factors affect them.

To estimate the amount of compensation attributable to paid time off, a measure of hours or days paid was needed. Estimating the number of days paid for but not worked is complicated by the fact that employers are not required to pay all workers for vacations and holidays. The Factories Act stipulates that production workers and salaried workers in organized manufacturing are entitled to 1 day of earned leave for every 20 days worked in the previous year.[35] Also entering into the calculation are 10 national holidays in India during which employees do not work, but are paid.[36] However, employers are only legally required to provide paid leave to employees who were hired directly. There is no legal obligation to provide paid time off for contract workers, although the contractor is supposed to do so; however, anecdotal evidence indicates that these workers often are not paid for time off. For this reason, BLS calculated an estimate of the number of paid days worked and of the number of paid days not worked for three separate groups of workers in the Indian organized manufacturing sector: directly hired workers other than production workers, directly hired production workers, and contract workers.

Man-days in the Indian organized manufacturing sector for salaried workers can be derived from data published by the CSO for all employees and for production workers. Separate man-days data for directly hired and contract production workers, respectively, are not available, so BLS allocated production worker man-days using the ratio of people employed as directly hired employees to those employed as contract workers. Then, paid leave days for salaried workers and directly hired production workers were calculated. The number of paid leave days for contract production workers is assumed to be zero since employers have no legal obligation to pay them.[37] (That is, contract workers are removed from the calculation of man-days paid but not worked.) Paid leave excluding holidays for non-contract employees is estimated to be 1 day for for every 20 days worked (because of the requirement in the Factories Act). The sum of paid holidays and paid leave days excluding holidays is the total number of days paid but not worked; this sum is added to the published number of man-days worked to get the total number of paid man-days in manufacturing. All the aformentioned calculations were done on a per-worker basis.

The ratio of man-days worked to man-days paid can be multiplied by the earnings (without bonuses) figure reported in the ASI to provide a rough estimate of aggregate pay for time worked—or basic wages and salaries. All employees' pay for time worked is the sum of production

workers' pay for time worked and salaried workers' pay for time worked. To get average hourly earnings, this aggregate is then divided by aggregate hours worked, or the product of man-days worked and estimated daily hours worked. The value of pay for time not worked can also be calculated by subtracting aggregate pay for time worked from earnings (without bonuses).

Next, total compensation ratios were calculated by BLS. The total compensation ratio is a multiplicative factor that, when applied to the average hourly earnings figure, results in a product equal to total compensation. For India, it was calculated by dividing aggregate total compensation by aggregate total pay for time worked. Total compensation was calculated by summing total direct pay (pay for time worked, pay for time not worked, and bonuses) and aggregate annual social insurance costs. Aggregate annual social insurance costs for all employees in Indian manufacturing are equal to employers' contributions to the Provident Fund and other funds plus worker and staff welfare expenses.

As noted earlier, data from the ASI are reported on a fiscal-year basis, from April 1 to March 31. In order to compare the total compensation estimates created from fiscal-year ASI data with the corresponding estimates from other countries in the BLS hourly compensation series, the data must be adjusted to conform to a calendar-year basis. To do this, BLS used a weighted average of two sets of ASI fiscal-year data. For example, to obtain data for calendar-year 2005, BLS applied a weight of 0.25 to ASI 2004–05 estimates and a weight of 0.75 to ASI 2005–06 estimates. The 0.25 figure represents the quarter of 2005 that is covered in ASI 2004–05 (January 2005–March 2005) and the 0.75 figure represents the three quarters of 2005 that are covered in ASI 2005–06 (April 2005–December 2005). Under this system of estimation, the most recent calendar year for which ASI data were

available at the time this article was written was 2005.

Estimate of hourly compensation for production workers. The foregoing discussion relates to the procedures used to derive estimates of hourly compensation for all employees in manufacturing. BLS also constructed estimates of hourly compensation of production workers. Data on earnings of production workers are available from the ASI, but those data differ from the data for all employees in that bonuses are not included. In order to put the production worker estimates and the all-employee estimates on a comparable basis, BLS derived an estimate of bonuses that was added to the earnings of production workers. Bonuses and social insurance have been redistributed among workers in a manner proportionate to their earnings; this procedure was recommended by the CSO as a method of estimating these components of compensation.[38] Under the assumption that all employees (including production workers) receive bonuses in direct proportion to their wages, bonuses were estimated by applying the ratio of all employees' bonuses paid to their nonbonus earnings. Like data on bonuses, data for social insurance expenditures for production workers are not available from the ASI. Thus, BLS applied the ratio of social insurance to earnings for all employees to production workers' earnings in order to derive an estimate of social insurance expenditures for production workers. Similar methods are used in the BLS series for a number of countries for which the requisite production-worker data are lacking. Research conducted by BLS in the past for several other countries has shown that this practice does not substantially affect the hourly compensation estimates.

Results

Table 2 displays detailed estimates of India's hourly com-

Table 2.	Hourly compensation costs in India's organized manufacturing sector, 1999–2005								
Year	Mean hourly earnings in rupees (hourly pay for time worked) [1]		Total compensation ratio [2]		Hourly compensation in rupees [3]=[1] × [2]		Exchange rate: rupees/ USD [4]	Hourly compensation in USD [5]=[3] ÷ [4]	
	All employees	Production workers	All employees	Production workers	All employees	Production workers		All employees	Production workers
1999.........	20.68	15.97	1.423	1.423	29.43	22.72	43.06	0.68	0.53
2000.........	22.54	16.97	1.406	1.406	31.68	23.86	44.94	.70	.53
2001.........	23.77	17.57	1.416	1.416	33.65	24.88	47.22	.71	.53
2002.........	24.95	18.22	1.417	1.417	35.36	25.83	48.63	.73	.53
2003.........	26.58	18.98	1.417	1.418	37.68	26.91	46.59	.81	.58
2004.........	27.57	19.46	1.398	1.398	38.55	27.21	45.26	.85	.60
2005.........	29.10	20.06	1.375	1.376	40.02	27.60	44.00	.91	.63
SOURCE: BLS estimates made by use of Annual Survey of Industries data from the Central Statistical Organisation of India.									

Chart 2.	**Components of hourly compensation in India's organized manufacturing sector, 2005**

Total hourly compensation = 40 rupees

Pay for time worked (average hourly earnings)	Other direct pay	Social insurance

Pay for time worked (average hourly earnings) = 29 rupees	Other direct pay = 4 rupees	Social insurance = 7 rupees

SOURCE: BLS estimates made by use of Annual Survey of Industries data from the Central Statistical Organisation of India.
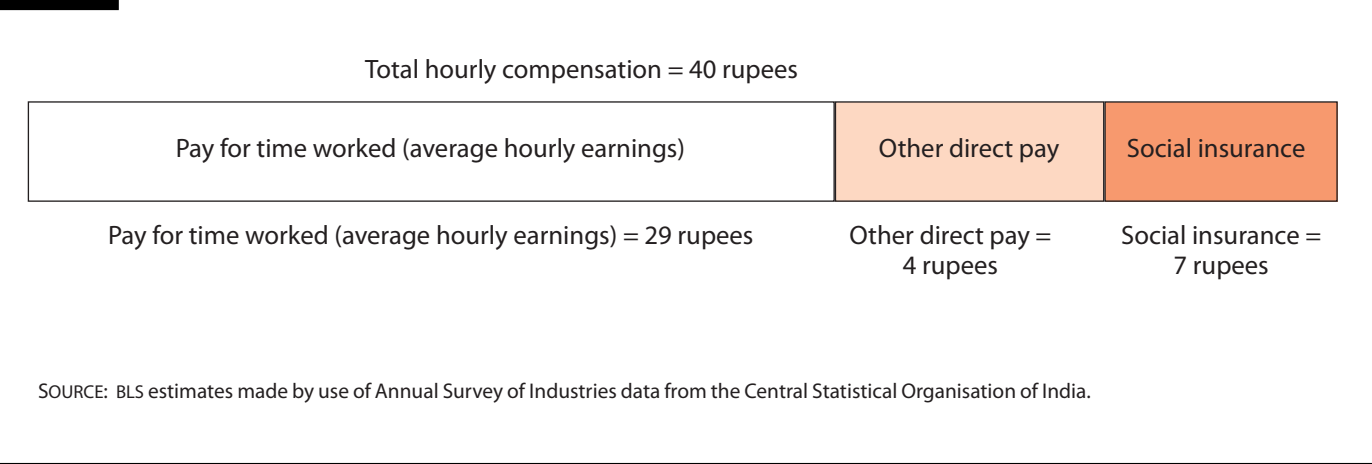
pensation costs for all employees and for production workers. When measured in Indian rupees, total compensation of all employees in India's organized manufacturing sector increased by 36.0 percent from 1999 to 2005. From 1999 to 2003, total hourly compensation for all employees grew, on average, by 6.4 percent each year. The growth of hourly compensation slowed to 2.3 percent in 2004 and was 3.8 percent in 2005.

When measured in U.S. dollars the increase for all employees was slightly less (34.1 percent) over the same period because of the depreciation of the rupee relative to the dollar. Overall, the rupee depreciated slightly over the 1999–2005 period, but appreciated from 2002 through 2005. Increases in hourly compensation were accompanied by decreases in the value of the rupee against the U.S. dollar from 1999 to 2002—which is evidenced by relatively small increases in the all-employees section of column 5 during these years. Hourly compensation as measured in U.S. dollars grew much faster from 2003 through 2005 as the rupee appreciated against the dollar.

The ratio of total compensation to average hourly earnings rose or stayed the same every year from 2000 to 2003. However, the ratio decreased slightly over the last 2 years of the 1999–2005 period, declining from 1.417 in 2003 to 1.375 in 2005. The total compensation adjustment ratio is obtained by dividing total compensation by pay for time worked; for India, average hourly earnings are equal to pay for time worked.

Changes in total compensation are affected by changes in any component of compensation. The components on which BLS has data for India's organized manufacturing sector are the following: pay for time worked (average hourly earnings), other direct pay (which for India consists primarily of pay for time off and bonuses), and so-

cial insurance. (See chart 2.) From 1999 to 2005, average hourly earnings increased 40.7 percent, other direct pay grew by 31.7 percent, and average social insurance expenditures per hour increased 20.7 percent; in 2004 and 2005, average social insurance expenditures actually decreased. Widespread pension reform has been occurring across in India over the past several years as many states move from defined benefit pension schemes to defined contribution schemes, but it is unclear exactly what role this has played in trends in social insurance expenditures.[39] Typically, it takes some time for the effects of pension reform programs to show up in labor cost data, and many changes have been happening in India simultaneously. Longer time series of data for India will likely provide more insight into trends in social insurance.

Pay for time worked, or basic wages and salaries, accounted for the largest portion of total compensation in India's manufacturing sector by far in 2005 (approximately 73 percent). As noted earlier, this component of compensation grew the fastest in comparison with other components of compensation over the 1999-to-2005 period.

For production workers, average hourly earnings increased by only 25.6 percent over the 1999–2005 period, compared with 40.7 percent for all employees, so total compensation for production workers as measured in Indian rupees increased significantly less than it did for all employees over the same period (21.5 percent versus 36.0 percent). Production workers' total compensation as a percentage of all employees' total compensation decreased as result. (See chart 3.)

ASI data on employment and man-days show that, over the 7-year period, the average employee in India's organized manufacturing sector consistently worked about 305 days a year, with the exception of 1999, for which

Chart 3. Total hourly compensation of all employees and of production workers in India's organized manufacturing sector, 1999–2005
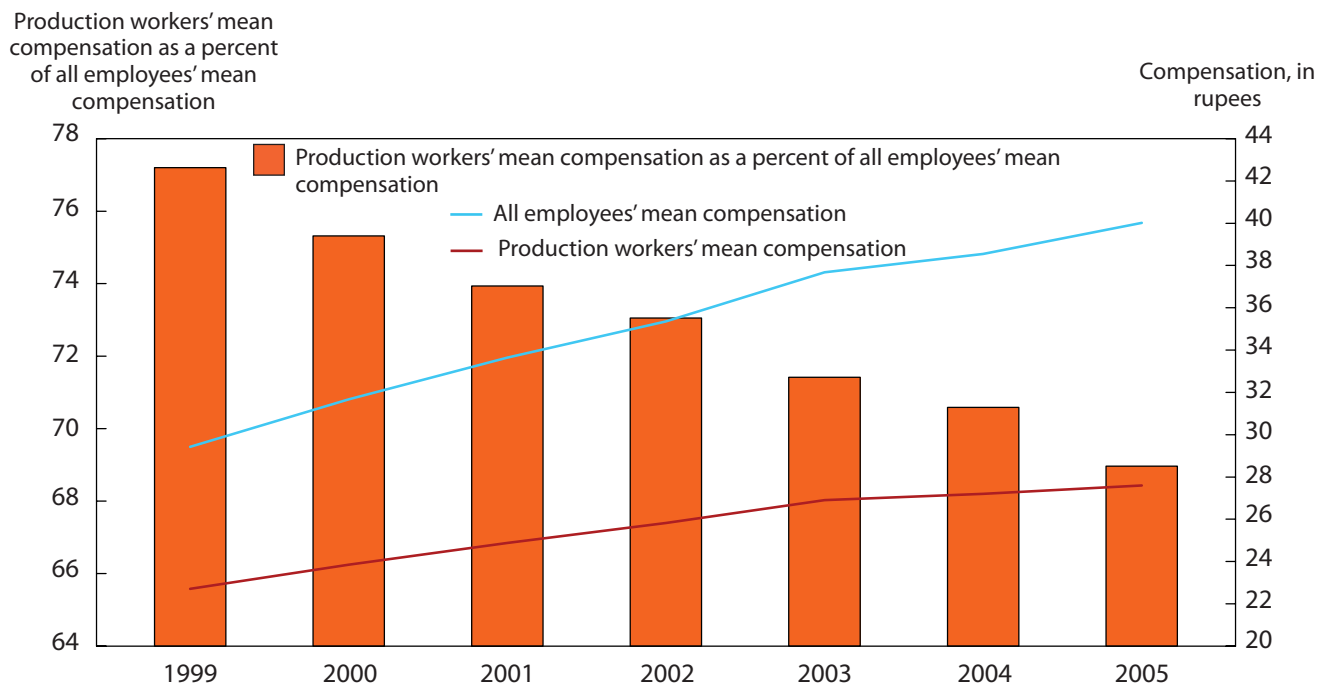
SOURCE: BLS estimates made by use of Annual Survey of Industries data from the Central Statistical Organisation of India.

the average was 289. This implies that, for the 2000-to-2005 period, employees worked an average of just under a 6-day workweek, which is consistent with the information received from the CSO and from interviews with Indian employers.

Comparisons with other countries

Hourly compensation costs in India are among the lowest when compared with the 36 countries in the BLS hourly compensation series.[40] In 2005, India's average hourly compensation cost for all employees in manufacturing ($0.91) was approximately 3.1 percent of the level seen in the United States ($29.74) when measured in U.S dollars. (See chart 4.) Over the period from 1999 to 2005, hourly compensation costs for all employees in Indian manufacturing fluctuated between 2.7 and 3.1 percent of the U.S. level. This fluctuation is due in part to changes in the rupee-to-dollar exchange rate. As seen earlier, measured in rupees, hourly compensation costs increased each year from 1999 to 2005.
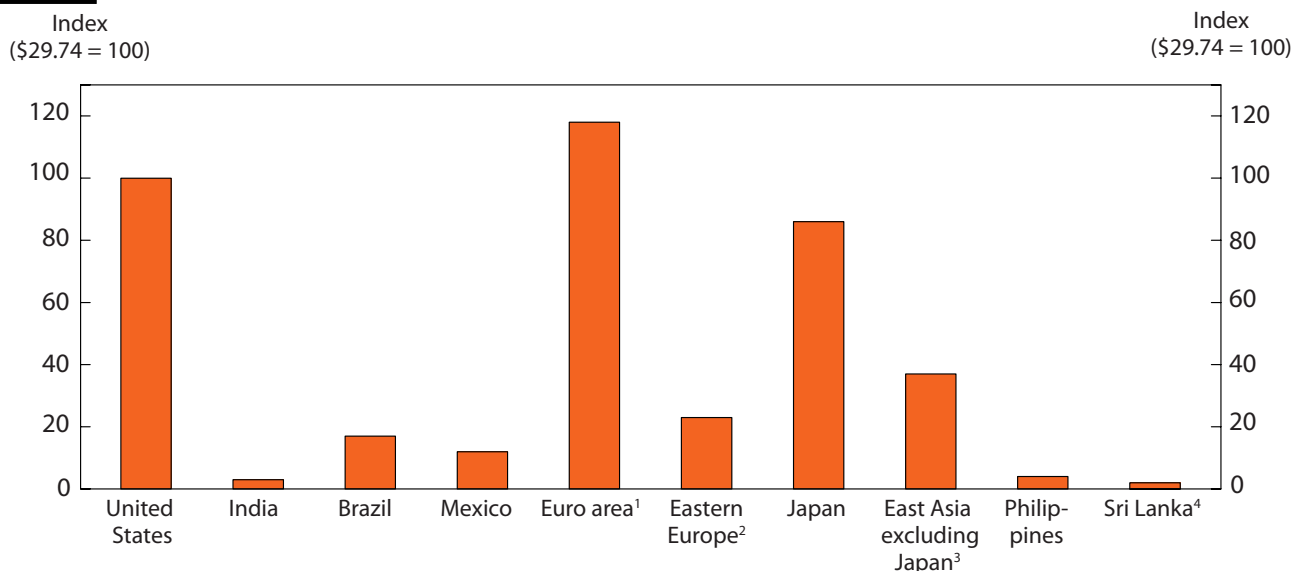
Among the economies studied by BLS, the lowest hourly compensation costs for all employees in manufacturing in 2005 were found in India (3.1 percent of the U.S. level)

and the Philippines (3.6 percent of the U.S. level). The average hourly compensation cost for manufacturing production workers in Sri Lanka, a country for which BLS publishes hourly compensation cost data for production workers only, was 2.3 percent of the U.S. average hourly compensation of all manufacturing production workers. Compensation costs were moderately higher in Mexico, Brazil, the Eastern European countries, and in the countries in East Asia excluding Japan—countries that are often thought of as having relatively low manufacturing compensation costs.

When BLS hourly compensation estimates for India's production workers were compared with estimates of hourly compensation of U.S. production workers, the analysis yielded results similar to the those obtained in the analysis for all employees. The cost of employing 1 hour of production worker labor in India in 2005 ($0.63) was equal to 2.6 percent of the cost in the United States ($23.81) as measured in U.S. dollars. (See table 2.)

Historically, other countries in the BLS series have been in comparatively low positions, similar to those of India, the Philippines, and Sri Lanka. In 1975, the initial year of the BLS hourly compensation series, hourly compensation costs for production workers in manufacturing in Korea

and Taiwan were equal to 5 percent and 6 percent of the U.S. level, respectively, when measured in U.S. dollars.[41] As these countries became larger players in the global marketplace, their compensation costs grew more quickly than those of the United States, whose global manufacturing presence was already well established. By 1980, compensation costs in Korea and Taiwan had increased to 10 percent and 11 percent of the U.S. level, respectively. By 2005, the percentages had increased to 52 percent and 27 percent.
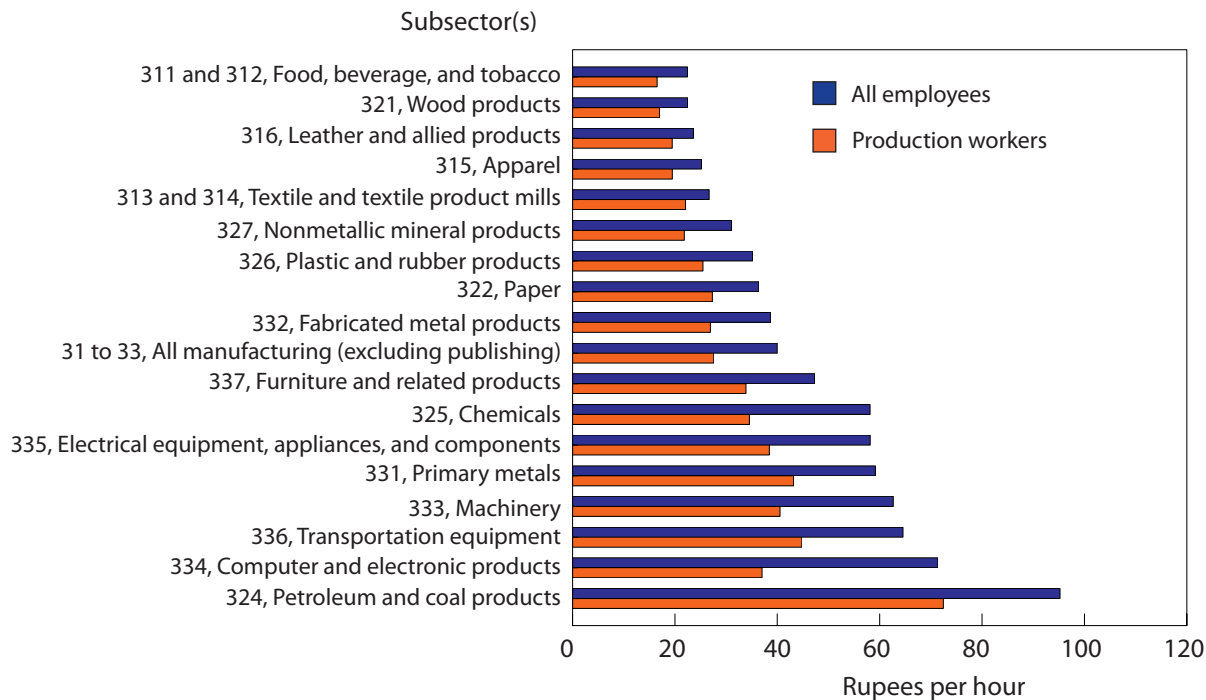
Subsectors within manufacturing

Employment and earnings data are also available for 18 "industries" within the manufacturing sector in India. For this analysis, the food manufacturing subsector (NAICS 311) and the beverage and tobacco product manufacturing subsector (NAICS 312) are considered together as one industry. The same goes for the textile mills subsector (NAICS 313) and the textile product mills subsector (NAICS 314). Each of the other 16 "industries" is a subsector. The level of total compensation in all manufacturing can mask important differences among the compensation levels in the subsectors within manufacturing. In some subsectors,

employer labor costs are much higher, or much lower, than in other subsectors. Also, some subsectors have high employment relative to others. Compensation costs in subsectors within manufacturing can provide insights that are useful for making international comparisons, because individual subsectors generally play larger roles in some countries than in others. Data on all employees' aggregate earnings and on their aggregate social insurance paid, as well as on their employment and man-days worked, are available for the subsectors.

In 2005, the lowest hourly compensation costs were in food, beverage, and tobacco manufacturing, and in wood product manufacturing. (See chart 5.) Employees were most highly compensated in the petroleum and coal products manufacturing subsector; costs in this subsector were more than twice the level faced by employers in all manufacturing subsectors on average. However, because this subsector accounts for only 1 percent of total employment in the organized manufacturing sector, these high compensation costs have little effect on the average compensation level for all of manufacturing.

Six subsectors make up about half of all manufacturing employment in India's organized sector. The ASI 2005–06 data show that organized-sector employment is highest

Chart 5. Mean total hourly compensation in India's organized manufacturing sector, by subsector, 2005

Subsector(s)

311 and 312, Food, beverage, and tobacco
321, Wood products
316, Leather and allied products
315, Apparel
313 and 314, Textile and textile product mills
327, Nonmetallic mineral products
326, Plastic and rubber products
322, Paper
332, Fabricated metal products
31 to 33, All manufacturing (excluding publishing)
337, Furniture and related products
325, Chemicals
335, Electrical equipment, appliances, and components
331, Primary metals
333, Machinery
336, Transportation equipment
334, Computer and electronic products
324, Petroleum and coal products

All employees

Production workers

0   20   40   60   80   100   120

Rupees per hour

SOURCE: BLS estimates made by use of Annual Survey of Industries data from the Central Statistical Organisation of India.

in the following industries: food, beverage, and tobacco manufacturing (two subsectors considered together, as previously mentioned); textile and textile product mills (two subsectors considered together, as previously mentioned); chemical manufacturing (NAICS 325); and primary metal manufacturing (NAICS 331).[42] (See table 3.) Food, beverage, and tobacco manufacturing, and textile and textile product mills are among the lowest paid industries in India's organized manufacturing sector and in 2005–06 accounted for over 36 percent of all organized-sector manufacturing employment. Their high employment share and low compensation levels drag down the average compensation level for all of manufacturing.

Data on employment of production workers in manufacturing subsectors are reported in the ASI; however, man-days for production workers in the subsectors are not. Because man-days are directly linked to the level of employment in any given industry, BLS was able to estimate the number of man-days worked by production workers in each of the manufacturing subsectors by use of employment and man-days data for all employees and employment data for production workers.

In 2005, the average hourly compensation cost for production workers in India's organized manufacturing sector was 31 percent lower than average hourly compensation for all employees. (See chart 5.) Within manufacturing, however, the ratio of the mean hourly compensation of production workers to that of all employees varied across industries. Among the industries analyzed, the ratio was the greatest in textile and textile product mills, where hourly compensation of production workers was equal to 83 percent of the level of hourly compensation of all employees. In the computer and electronic product manufacturing subsector (NAICS 334), the difference between the hourly compensation of all employees and that of production workers varied greatly; the average compensation of production workers was only 52 percent of the average compensation of all employees in the same subsector. Generally, subsectors that required more technical expertise tended to have greater differentials between all employees' average hourly compensation and that of production workers.

International comparisons of subsectors within manufacturing. As previously noted, when 2005 data from other countries in the BLS series are compared with those from India, only the Philippines is found to have similar hourly compensation costs in the manufacturing industry as a

Table 3.	Employment in subsectors within India's organized manufacturing sector, 2005–06	
NAICS code(s)	Subsector(s)	Percent of total manufacturing employment (8,688)
31–33	All manufacturing (excluding publishing)................	100.0
311–312	Food, beverage, and tobacco.........................	20.9
313–314	Textiles and textile product mills....................	15.3
325	Chemicals..	9.5
331	Primary metals...	7.4
327	Nonmetallic mineral products......................	6.6
336	Transportation equipment.............................	6.4
315	Apparel..	6.2
333	Machinery...	5.3
332	Fabricated metal products............................	4.2
326	Plastics and rubber products.........................	3.6
335	Electrical equipment, appliances, and components..	3.1
322	Paper...	2.3
316	Leather and allied products...........................	2.0
334	Computer and electronic products............................	1.6
324	Petroleum and coal products........................	1.0
321	Wood products..	.6
337	Furniture and related products......................	.4

SOURCE: BLS estimates made by use of Annual Survey of Industries data from the Central Statistical Organisation of India.

NOTE: The sum of the subsectors' percents of total manufacturing employment does not equal 100 because of the exclusion from the table of certain subsectors whose data BLS does not publish.

whole. International comparisons of hourly compensation costs in manufacturing subsectors also can be made. (See chart 6.) When hourly compensation costs are calculated as a percentage of those costs in the United States, labor in India is found to be substantially less expensive than labor in the Philippines in five industries: food, beverage, and tobacco manufacturing; textile and textile product mills, chemical manufacturing; nonmetallic mineral product manufacturing; and transportation equipment manufacturing. Hourly compensation costs in these industries were at least 1.25 percentage points lower in India than in the Philippines when measured as a percentage of hourly compensation costs in the United States. For countries with such low levels of labor costs, a difference of 1.25 percentage points, or more, of the U.S. level is significant—in the food, beverage, and tobacco manufacturing industry, costs in the Philippines ($1.03) are actually double those in India ($0.51). Although these results can vary from year to year depending on currency exchange rates, they do provide an example of labor costs within manufacturing varying across countries to a greater extent than

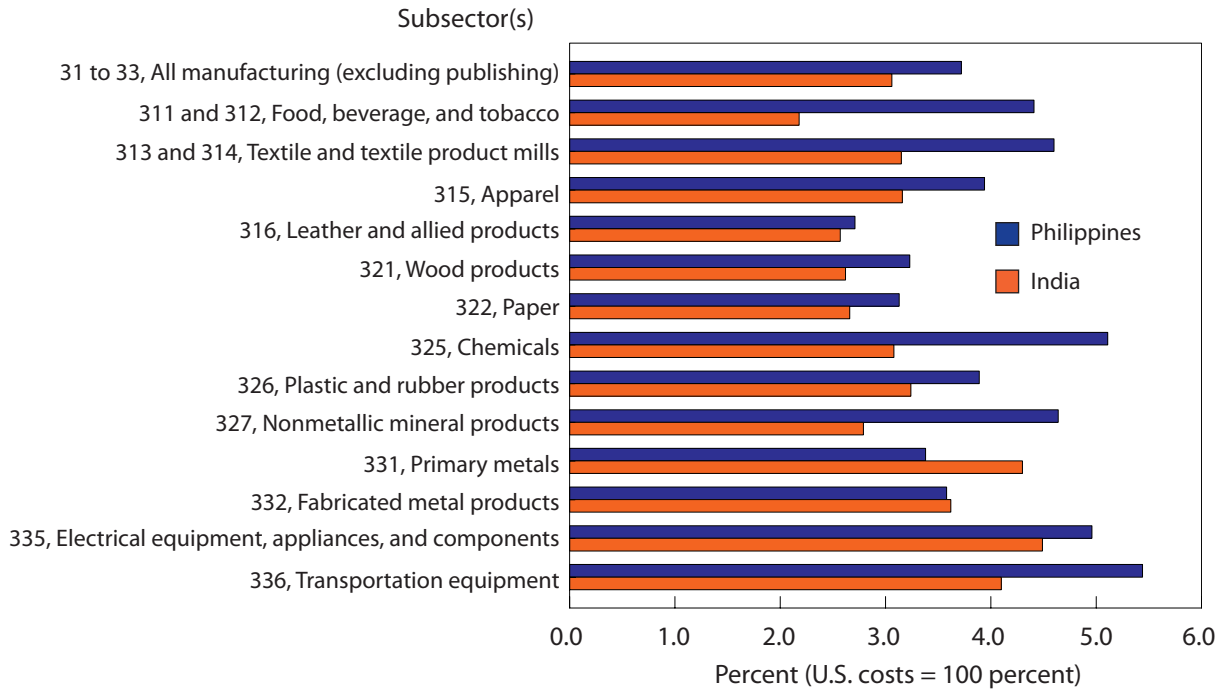they do in manufacturing as a whole.[43]

Comparisons of India with China

India and China are two countries that often have been compared in terms of their manufacturing and development potential. Even with the recent growth in India's manufacturing activity, the manufacturing sector in India is still considerably smaller than the manufacturing sector in China. The $70 billion in manufacturing goods exported by India over the 2006 fiscal year is still only one-tenth of the $700 billion in manufactured goods exported by China in 2005.[44] The difference in the magnitude of the manufacturing sector can also be seen when one compares manufacturing activity with overall GDP for each country. Over the period from 2000 to 2005, manufacturing accounted for 32 percent of China's GDP, while accounting for only 16 percent of India's GDP.[45] In 2005, 108.4 million workers were employed in China's manufacturing sector on average, while only 8.7 million were employed in India's organized manufacturing sector, according to ASI 2005–06.[46] Even when workers in the unorganized sector are included, India's total manufacturing employment is still dwarfed by employment in the Chinese manufacturing sector. For now, China's manufacturing sector outweighs India's—even when the unorganized sector is included.

In terms of population, India has been growing faster than China, and it surpassed 1 billion people in the year 2000.[47] In 1990, the population of India was equal to 73 percent of the population of China. By 2008, India's population had grown to equal 86 percent of the level in China. Additionally, India's population is younger than China's. (See charts 7 and 8.) Because India's population pyramid is currently bottom heavy, or concentrated in the younger age groups, over the next few decades the working-age population will grow considerably. This larger labor supply could serve as a source of growth for the manufacturing sector in India. China's population pyramid is different in that the largest segment of the population is currently in the 35–44 age range and the younger age groups contribute less to the overall population. Thus, one would not expect the working-age population in China to experience the same rate of growth as that in India.

The growing manufacturing sectors of India and China have attracted much interest in recent years. As regards statistics, it was mentioned earlier that India's statistical system is already highly developed relative to that of many other developing countries, even as it strives to improve itself. In China, the private sector has been largely

Chart 6. **Hourly compensation costs in India and the Philippines as a percent of costs in the United States, measured in U.S. dollars, 2005**

Subsector(s)

31 to 33, All manufacturing (excluding publishing)
311 and 312, Food, beverage, and tobacco
313 and 314, Textile and textile product mills
315, Apparel
316, Leather and allied products
321, Wood products
322, Paper
325, Chemicals
326, Plastic and rubber products
327, Nonmetallic mineral products
331, Primary metals
332, Fabricated metal products
335, Electrical equipment, appliances, and components
336, Transportation equipment

■ Philippines
■ India

Percent (U.S. costs = 100 percent)

SOURCE: BLS estimates made by use of Annual Survey of Industries data from the Central Statistical Organisation of India; see **ftp://ftp.bls.gov/pub/special.requests/ForeignLabor/aecountrytables.txt** for Philippines data.

Chart 7. **Population pyramid, India, 2006**

Age

Males

Females

Percent
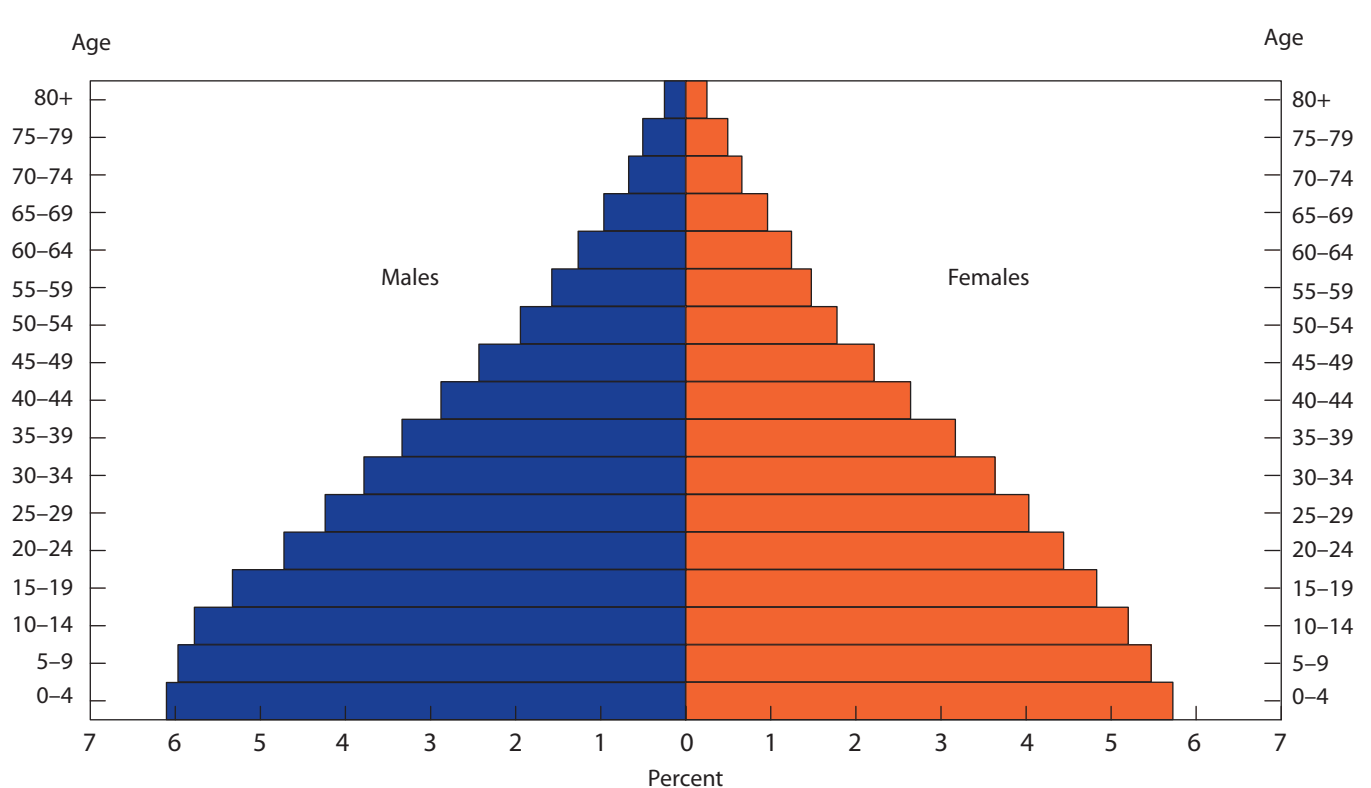
SOURCE: Population Reference Bureau projections, based on the 2001 Census of India.

Chart 8. Population pyramid, China, 2007

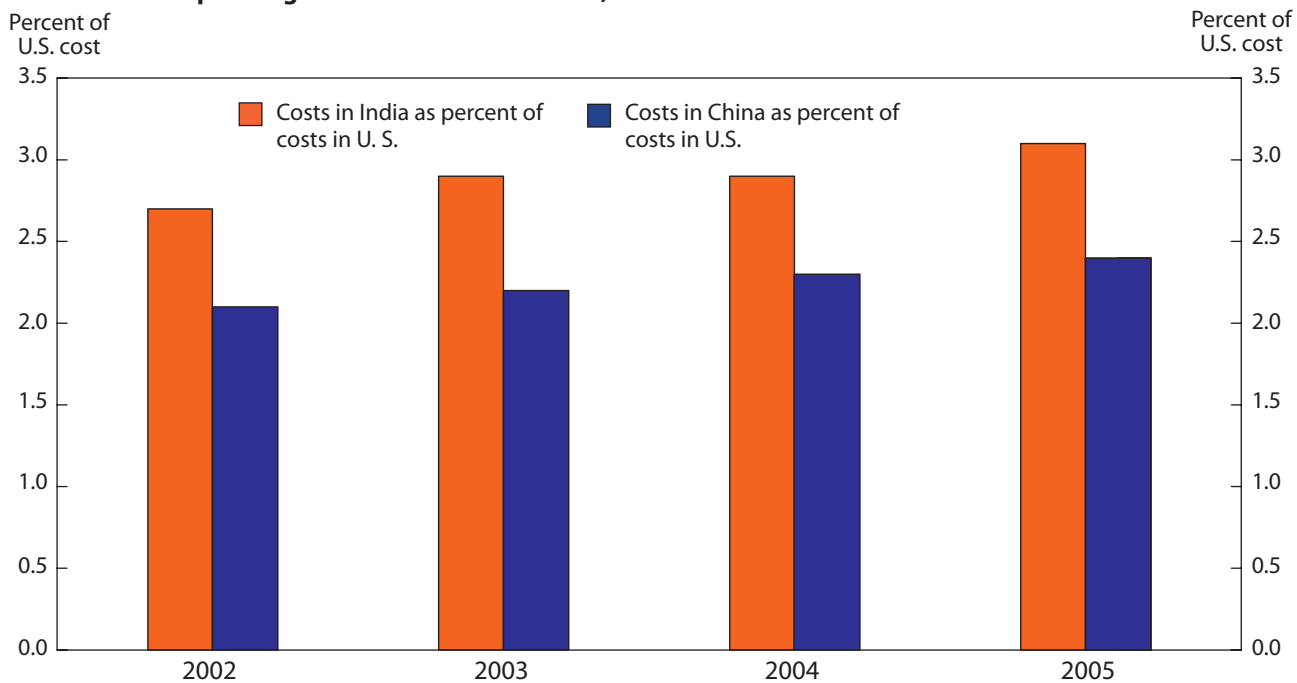Source: U.S. Census Bureau, International Data Base.
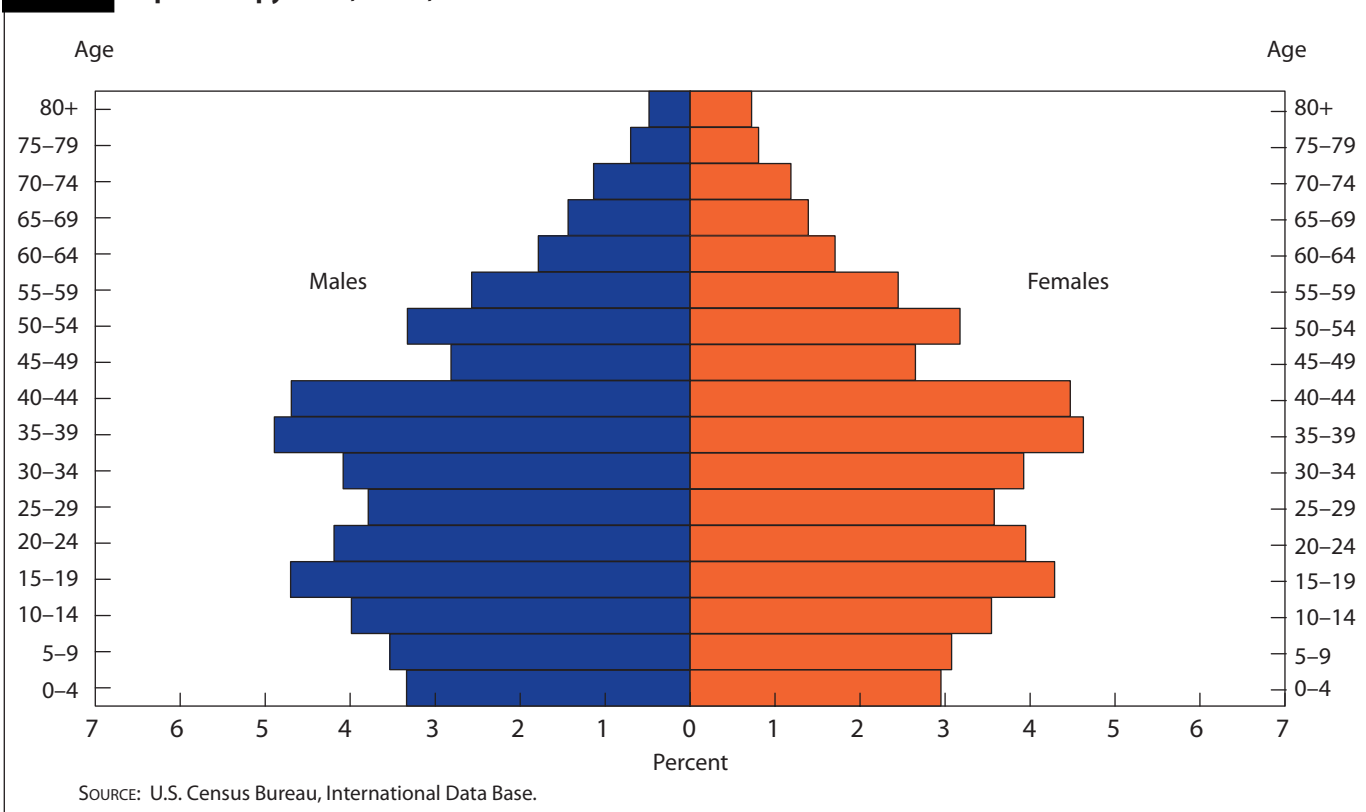
neglected in statistics; the dominance of private sector businesses in today's economy does not fit easily into the theories and ideologies that prevailed in China in the recent past.[48] During the most recent quarter century of economic reform, China has been working to adopt better, internationally recognized statistical practices, with guidance from developed countries and from international organizations such as The World Bank and the International Monetary Fund. However, much work remains to be done.

BLS has conducted extensive research on China's manufacturing sector and published research on employment and hourly compensation in Chinese manufacturing.[49] In November 2006, BLS published, for the first time in a news release, a supplemental hourly compensation series for Chinese manufacturing; it covered the years 2002–04. To date, estimates for China through 2006 are available from BLS.[50]

BLS now has estimates of hourly compensation for employees in manufacturing in both India and China. These estimates can be compared to gain insight into the relative compensation costs in the two countries, but they are not derived by use of the same methods. The features of the Chinese source data and the BLS hourly compensa-

tion estimation methods vary from those used in the series for India. Readers should refer to articles previously published in *The Monthly Labor Review* for a comprehensive description of the estimation methods used to calculate hourly compensation costs for employees in Chinese manufacturing.[51]

For China, hourly compensation estimates can be broken into three employment-based groups: all employees, employees in urban enterprises, and employees in town and village enterprises. As discussed, the compensation costs presented for India refer to all employees in the organized sector. Compensation costs for employees in India's unorganized sector are not presented here. Because the employment groups are defined differently for each country, and because of how difficult it can be to collect reliable data on employment and compensation in both India and China, there are limitations associated with comparisons of hourly compensation costs between the two countries. Nevertheless, BLS research on both countries indicates that the concept of all employees in the organized manufacturing sector in India is similar enough to the "all employees" concept for manufacturing in China (estimates are calculated as the employment-weighted average of Chinese urban and town and village enterprise

Chart 9. Mean hourly compensation costs in the manufacturing sectors of India and China as a percent of corresponding costs in the United States, 2002–05

Percent of
U.S. cost

Percent of
U.S. cost

█ Costs in India as percent of costs in U. S.   █ Costs in China as percent of costs in U.S.

NOTE: Mean hourly compensation costs for all manufacturing employees in China were the following: $0.57 in 2002, $0.62 in 2003, $0.67 in 2004, and $0.73 in 2005. The corresponding costs in India are reported in table 2.

SOURCES: BLS estimates made by use of Annual Survey of Industries data from the Central Statistical Organisation of India; *International comparisons of hourly compensation costs in manufacturing, 2007* (Bureau of Labor Statistics), March 26, 2009.

manufacturing) to allow for rough comparisons to be made.

Organized-sector compensation costs in India and compensation costs for all employees in Chinese manufacturing were both very low in comparison with corresponding costs in the United States from 2002 through 2005. Chart 9 shows that costs in China were lower than those in India each year. During this period hourly compensation costs increased by 25 percent in India and by 28 percent in China as measured in U.S dollars. According to preliminary BLS research, if data were available to create a series on hourly compensation encompassing the total number of employees in Indian manufacturing—including employees in both the organized and unorganized sectors—the estimate would be considerably lower because workers in India's unorganized sector earn substantially less than their organized-sector counterparts and greatly outnumber them.

It has been reported that some manufacturers are finding labor shortages in China, a situation that is already causing wages to rise and making goods costlier to produce.[52] Businesses that choose India for offshore production face challenges as well, many of them stemming from the current state of India's infrastructure and labor laws. It is estimated that the average manufacturer in India loses 8.4 percent of its potential sales each year because of power outages, compared with less than 2 percent for the average manufacturer in China.[53] In 2005, annual spending on infrastructure as a share of GDP in India was 5.9 percent, compared with 14.6 percent in China.[54] In addition, the nature of manufacturing in India tends to be different from that in China. China's factories tend to be very large scale facilities that specialize in low-cost manufacturing of goods. In terms of value, the major items that are imported by the United States from China include the following: toys and sporting goods, miscellaneous household goods, computers and computer accessories, telecommunications equipment, video equipment, and cotton household furnishings and clothing.[55] In India, extensive required paperwork, restrictive labor laws, and spotty power supplies make large-scale factories less common than in China. Instead of using big factories, a large portion of Indian manufacturing relies on a mix of technical skill and low-cost labor to produce goods. India appears to have a competitive advantage over China in the manufacture of such items as cell phones, car parts, and apparel items that are more complex to construct.[56] In terms of value, the major manufacturing imports from India into the United States

are items such as jewelry; medicinal, dental and pharmaceutical preparations; drilling and oil field equipment and platforms; and industrial machinery.[57]

Although employers' labor costs in Indian and Chinese manufacturing are currently at similar levels, a 2002 Confederation of Indian Industry report created by McKinsey & Company indicated that the retail price of the average Chinese product is about 30 percent lower than the retail price of the same product produced in India, in spite of similar labor costs and other input costs.[58] The Indian National Manufacturing Competitiveness Council has gone on record asserting that the key to improving India's position in global manufacturing is to keep costs low.[59] Of course, manufacturing involves many other costs as well, such as shipping, raw materials, and tariffs. The Council also strongly endorsed the Second National Labor Commission's recommendation that India harmonize its currently scattered labor laws, stating that "with the harmonization not only will the flexibility improve in the organized labor market, simultaneously better social security provisions will also be made in the unorganized sector."[60] As more reforms are implemented and more resources invested, it will be of interest to the world whether India expands its share in global manufacturing.

Recent economic trends

According to India's Central Statistical Office, growth in Indian manufacturing in fiscal year 2006–07 was strong. In the organized sector, at constant prices, the GDP growth rate from 2005–06 to 2006–07 was 11.6 percent.[61] From 2006–07 to 2007–08, GDP growth slowed in the organized sector, but was still impressive: 7.6 percent. In manufacturing overall, including both the organized and the unorganized sectors, growth in GDP was slightly higher during these years—11.8 percent from 2005–06 to 2006–07 and 8.2 percent from 2006–07 to 2007–08. However, the global financial crisis that started in 2008 did not leave India untouched. Even though India is not a huge exporter and has a large domestic market for its goods, growth slowed considerably, to 2.4 percent from 2007–08 to 2008–09 in the organized sector. (When this article was authored, only GDP figures for total manufacturing were available).

The global financial crisis also indirectly affected India's growth potential because of the extent to which other countries around the globe were hit. India's plan to invest $500 billion in infrastructure improvements from 2008 through 2012 may have to be revisited, since one-third of that money was to come from the private sector. In 2007, "some of the world's biggest banks and private-equity funds announced dedicated infrastructure funds with India as a priority," and now, India is looking for those investors to begin building new roads.[62] As of April 2009, the National Highways Authority of India (NHAI) was having difficulty finding bidders on its infrastructure projects. However, by April 2010, the NHAI had restructured its project plans and its bidding requirements to attract more bidders.[63] In order for India to reach the level of exports envisioned by India's National Manufacturing Competitiveness Council and for manufacturing to truly be the engine of growth that it envisions, infrastructure growth in all forms—roads, power sources, ports, and so forth—likely will be important. Of course, manufacturing growth can be spurred by consumer demand as well. A recent *BusinessWeek* article states that domestic demand accounts for two-thirds of the Indian economy and that Indians can "buy their way to growth."[64] BLS will continue to make estimates and monitor trends in hourly compensation costs in India's organized manufacturing sector as updated ASI data are released by the CSO.[65]   □

Notes

[1] "Table. PPP Conversion Factors and Share of Global Output, 2007" (Washington, DC, International Monetary Fund, January 8, 2008). Visit **www.imf.org/external/pubs/ft/survey/so/2008/res018a. htm** and click on "Link to PPP data" under "Related Links (visited Apr. 26, 2010); *WTO: developing, transition economies cushion trade slowdown*, Press/520/Rev. 1 (World Trade Organization) Apr. 17, 2008, Appendix Table 3, "Merchandise trade: leading exporters and importers, 2007," on the Internet at **www.wto.org/english/news_e/pres08_e/pr520_e. htm#appendix_table3** (visited Apr. 26, 2010).

[2] *The National Strategy for Manufacturing* (Government of India National Manufacturing Competitiveness Council, March 2006), 1.1, p. 2, on the Internet at **http://nmcc.nic.in/pdf/strategy_paper_0306. pdf** (visited Apr. 26, 2010).

[3] *Statement 010. Summary of macro economic aggregates at constant (1999-2000) prices, 1950-51 to 2008-09* (Government of India, Ministry of Statistics and Programme Implementation, Central Statistical

Organisation, National Accounts Division), on the Internet at **www. mospi.gov.in/mospi_nad_main.htm** (visited Apr. 26, 2010).

[4] *International Comparisons of Hourly Compensation Costs in Manufacturing*, News Release number USDL 09–0304, (Bureau of Labor Statistics, Mar. 26, 2009).

[5] Judith Banister, "Manufacturing earnings and compensation in China," *Monthly Labor Review*, August 2005, pp. 22–40, on the Internet at **www.bls.gov/opub/mlr/2005/08/art3full.pdf;** and *International Comparisons of Hourly Compensation Costs in Manufacturing*.

[6] *Report of the National Statistical Commission,* section 1.1 (Government of India, Ministry of Statistics and Programme Implementation, Sept. 5, 2001), on the Internet at **http://mospi.gov.in/nscr/hp.htm** (visited May 11, 2010).

[7] *Ibid.*

[8] *Ibid*, section 14.2.

[9] Dr. Govindan Raveendran, *Reforming the Indian Statistical System* (Organisation for Economic Co-operation and Development), *The Statistics Newsletter*, February 2006, on the Internet at **www.oecd.org/dataoecd/13/62/36132793.pdf** (visited May 11, 2010).

[10] See *Key Indicators of the Labor Market* (International Labour Organization), section 7, on the Internet at **http://ilo-mirror.library. cornell.edu/public/english/employment/gems/eeo/download/kilm07.pdf** (visited May 12, 2010).

[11] *Informal Sector in India: Approaches for Social Security* (Government of India, Ministry of Labour), p. 2, on the Internet at **http://labour. nic.in/ss/INFORMALSECTORININDIA-approachesforSocialSecurity.pdf** (visited Apr. 29, 2010). The unorganized sector includes enterprises run by unincorporated businesses and partnerships, in addition to cooperative societies (co-ops owned and managed by and for the benefit of the customers or workers), trusts (corporations organized to perform a fiduciary function), private companies (firms not owned by the government) and limited companies (corporations with shareholders whose liability is limited by shares), all of which are not included in the informal sector as defined by the International Labour Organization.

[12] *Statement 010. Summary of macro economic aggregates.*

[13] Output is measured at factor cost. BLS was unable to locate reliable data that could indicate the portion of India's manufacturing exports that are produced in the organized sector or the portion produced in the unorganized sector.

[14] See the 1999–2000 *Annual Survey of Industries* (Government of India, Ministry of Statistics and Programme Implementation), on the Internet at **http://mospi.gov.in/mospi_asi.htm**; and *Employment and Unemployment in India, 1999-2000: Key Results*, Report No. 455(55/10/1) (Government of India, Ministry of Statistics and Programme Implementation, National Sample Survey Organisation), on the Internet at **http://www.mospi.gov.in/mospi_nsso_rept_pubn. htm** (visited May 11, 2010). The ASI's exact coverage of the manufacturing sector cannot be determined because the sample is drawn from the list of registered factories and not from a complete list of all manufacturing establishments in India.

[15] India's ASI defines "workers" as all people employed directly or through any agency, whether for wages or not, and engaged in any manufacturing process or in cleaning any part of the machinery or premises used for manufacturing process or in any other kind of work incidental to or connected with the manufacturing process or the product. Workers engaged in repair and maintenance or production of fixed assets for a factory's own use and workers employed in the production of electricity or coal, gas, etc. are included. This definition is deemed equal to the BLS definition of production workers, which is those employees who are engaged in fabricating, assembly, and related activities; material handling, warehousing, and shipping; maintenance and repair; janitorial and guard services; auxiliary production (for example, power plants); or other services closely related to the aforementioned activities. Working supervisors generally are included; apprentices and other trainees generally are excluded. However, the ASI definition includes workers who do not receive wages. This inclusion of some additional workers is not believed to significantly affect the BLS estimates of hourly compensation costs.

[16] The states of Arunachal Pradesh, Mizoram, and Sikkim, and the union territory of Lakshadweep are not included in the geographical coverage of the ASI. The source of this information is Carl Haub and O.P. Sharma, *Hourly Compensation Costs for Workers in India*, November 2005, unpublished manuscript.

[17] The Factories Act, 1948, Commercial Law Publishers (India) Pvt. Ltd., Delhi, 2006.

[18] The Collection of Statistics Act, 1953 (Government of India, Ministry of Law), on the Internet at **www.mospi.gov.in/mospi_stat_act53.htm** (visited May 3, 2010).

[19] The Factories Act, 1948.

[20] For the 2007 NAICS definition of the manufacturing sector, visit the BLS Web site at **www.bls.gov/iag/tgs/iag31-33.htm** (visited May 24, 2010).

[21] For information on NIC 1998 see **www.mospi.nic.in/nic_98.htm** (visited May 3, 2010). Raw data for industries 0140, 1422, 2211, 2212, 2219, and mining and utilities (industries 4000 to 4390) have been excluded from the BLS estimates.

[22] Note that the data published in this article do not match data published by India's CSO because of adjustments performed by BLS to make the data comparable with data calculated in a manner consistent with NAICS.

[23] BLS has no information on the level of nonresponse to the ASI.

[24] *International Comparisons of Hourly Compensation Costs in Manufacturing.*

[25] Amit K. Bhandari and Almas Heshmati, *Wage Inequality and Job Insecurity among Permanent and Contract Workers in India: Evidence from Organized Manufacturing Industries*, discussion paper no. 2097 (Institute for the Study of Labor, April 2006), p. 3, on the Internet at **http://ideas.repec.org/p/iza/izadps/dp2097.html** (May 3, 2010).

[26] Bhandari and Heshmati also point out that contract labor is not spread evenly across all industries within manufacturing. The ASI data support the claim of the Institute for the Study of Labor that labor-intensive industries like the tobacco industry hire a high percentage of contract labor, whereas industries such as the pharmaceutical industry that require more capital and highly skilled labor hire a relatively low percentage of contract labor. According to published ASI data, in

2005–06 contract workers accounted for 68.3 percent of all production workers in India's organized tobacco industry and only accounted for 31.7 percent of the production workers in the chemicals industry (which includes pharmaceuticals). As previously mentioned, contract workers accounted for 28.6 percent of all production workers in India's manufacturing sector in 2005.

[27] The Factories Act, 1948, section 59 (1), states: "Where a worker works in a factory for more than nine hours in any day or for more than forty-eight hours in any week, he shall, in respect of overtime work, be entitled to wages at the rate of twice his ordinary rate of wages."

[28] Carl Haub and O.P. Sharma, *Hourly Compensation Costs for Workers in India: 1989-1990 to 1997-1998 and 2003-2004*, September 2006, unpublished manuscript.

[29] Although publishing is not included in the NAICS definition of manufacturing, printing is included in manufacturing under NAICS subsector 323: printing and related support activities.

[30] Data on the structure of labor costs are used to analyze relationships among various components of labor costs. For example, structure-of-labor-costs data can provide information on the percent of total labor costs that is accounted for by the cost medical insurance.

[31] BLS was unable to locate data to serve as a proxy for pay in kind. BLS was unable to find conclusive evidence regarding what portion of total compensation pay in kind represents for the organized manufacturing sector, but it is believed to be small, and its exclusion should not significantly affect the estimates.

[32] Employers in Indian manufacturing currently are not subject to any taxes or subsidies linked to the level of employment in their firms; therefore, this component of total compensation is zero.

[33] Interviews were conducted in New Delhi by Carl Haub and O.P. Sharma during a 7-day period in July 2006. Out of the 120 employers in Faridabad who were mailed survey forms, 10 employers returned the completed form and 15 addresses were found to be invalid. Haub and Sharma, *Hourly Compensation Costs for Workers in India: 1989-1990 to 1997-1998 and 2003-2004*, September 2006, unpublished manuscript.

[34] BLS calculated hourly compensation using an average of 9 hours worked per day to see how the change in working time would affect the estimate. The result was that the change in working time had little effect. When measured in U.S. dollars, mean hourly compensation for all employees was $0.81 in 2005 and was still equal to approximately 3 percent of the U.S. level.

[35] The Factories Act, 1948, chapter 8.

[36] The 10 paid holidays included in BLS estimates are: New Year's Day, Holi, Id-ul-Fiter, Raksha Bandhan, Guru Nank's birthday, Dusshera, Diwali, Ambedkar Jayanti, Krishna's birthday, and Christmas. Some states observe more holidays than others; BLS chose to account for these major 10 paid holidays across all Indian states because they are those which function as paid holidays almost everywhere.

[37] Given that a manufacturer's responsibility for employees employed by contractors, as well as its need to keep records of these employees, ends when the contract is issued, it is not possible to estimate any amount of paid leave that contracted employees may receive. This is especially true of work delegated on short-term contracts. In addition, it is not legally required that employers provide any paid leave to contracted employees. For these reasons, BLS assumes no paid leave for contracted employees in the hourly compensation estimates presented in this article.

[38] Haub and Sharma, *Hourly Compensation Costs for Workers in India*, November 2005, unpublished manuscript.

[39] *India's Pension Reform: Chronology of Events*, Invest India Economic Foundation, on the Internet at **www.iief.com/chronology.htm** (visited May 5, 2010).

[40] In a 2006 paper, the Conference Board published an estimate of compensation per employee for India in 2002. See Bart van Ark, Judith Banister, and Catherine Guillemineau, *Competitive Advantage of "Low-Wage" Countries Often Exaggerated*, (The Conference Board, Executive Action Series, No. 212, October 2006), p. 5. The estimate is for "large-scale manufacturing" only, which includes registered manufacturing enterprises only—that is, those enterprises in the organized sector. The Conference Board reports that Indian manufacturing employees received compensation at a level equal to 2.5 percent of the level of compensation in U.S. firms. BLS estimates put Indian hourly compensation at a level equal to 2.7 percent of the U.S. level in 2002. The small difference between these numbers is likely due to differences in estimation methods. One obvious difference is that the Conference Board estimates measure the ratio of *annual* compensation per employee in India to *annual* compensation per employee in the United States, whereas BLS estimates measure the *hourly* compensation ratio. The Conference Board estimates that large-scale manufacturing employed 7.8 million employees in 2002—which includes unpaid family members, sole proprietors, etc. BLS omits this group of workers and only considers paid employees when estimating hourly compensation costs. See Judith Banister, *India and China: Demography, Human Capital, and Socioeconomic Transformations* (The Conference Board, 2007), p. 27. Additionally, as mentioned earlier, BLS excludes employment and compensation data from the ASI for industries that do not fit within the NAICS definition of manufacturing. BLS estimates that there were 7.5 million paid employees in the organized manufacturing sector in 2002.

[41] See "Table 1. Production Workers: Indexes of hourly compensation costs in U.S. dollars in manufacturing, 34 countries or areas and selected economic groups, 1975-2007" (Bureau of Labor Statistics, March 2009), on the Internet at **ftp://ftp.bls.gov/pub/special.requests/ForeignLabor/ichccpwsuppt01.txt** (visited May 5, 2010).

[42] The industries with the highest levels of employment are not necessarily the industries that contribute the most to India's position in the global economy, however. According to *The National Strategy for Manufacturing*, gems and jewelry, textiles and garments, engineering goods, chemicals, and leather and leather goods account for approximately 75 percent of India's exports.

[43] For a full list of the BLS international hourly compensation cost estimates for both all employees and production workers, visit the BLS Web site at **www.bls.gov/ilc/** (visited May 6, 2010).

[44] Michael Schuman, "The Drive to Compete," *Time*, June 19, 2006, on the Internet at **www.time.com/time/magazine/printout/0,8816,1205526,00.html** (visited May 6, 2010).

[45] Gordon H. Hanson and Raymond Robertson, *China and the Manufacturing Exports of Other Developing Countries* (Cambridge, Mass., National Bureau of Economic Research, July 2007), on the Internet at **www.nber.org/books_in_progress/china07/cwt07/hanson.pdf** (visited May 6, 2010).

[46] Erin Lett and Judith Banister, "China's manufacturing employment and compensation costs: 2002–06," *Monthly Labor Review*, April 2009, p. 32, on the Internet at **www.bls.gov/opub/mlr/2009/04/art-3full.pdf** (visited May 6, 2010).

[47] See the U.S. Census Bureau's International Data Base at **www.census.gov/ipc/www/idb/** (visited May 11, 2010), click on "Data Access," and select the country and years for which you would like to download data.

[48] Judith Banister, "Manufacturing employment in China," *Monthly Labor Review*, July 2005, p. 11, on the Internet at **www.bls.gov/opub/mlr/2005/07/art2full.pdf** (visited May 7, 2010).

[49] Judith Banister, *Manufacturing Employment and Compensation in China* (Bureau of Labor Statistics, November 2005), on the Internet at **www.bls.gov/fls/chinareport.pdf** (visited May 7, 2010).

[50] Lett and Banister, "China's manufacturing employment and compensation costs: 2002–06," pp. 30–38.

[51] Ibid; and Banister, "Manufacturing Employment and Compensation in China," pp. 26–47.

[52] Barbara Demick and David Pierson, "People, people everywhere in China, and not enough to work," Los Angeles Times, Mar. 28, 2010, on the Internet at **http://articles.latimes.com/2010/mar/28/world/la-fg-china-labor28-2010mar28** (visited May 11, 2010).

[53] *The National Strategy for Manufacturing*, 3.6.4, pp. 34–35. See also "The long journey," an article published in the June 3, 2006, issue of *The Economist*. On page 11, Vineet Agarwal of the Transport Corporation of India describes the typical journey cargo must make between Kolkata and Mumbai. The 1,340 mile trip takes 8 days at an average speed of less than 7 miles per hour. More than 32 hours are spent waiting at tollbooths and checkpoints.

[54] "India urged to copy China in infrastructure spending," *The China Post*, May 5, 2008, on the Internet at **www.chinapost.com.tw/business/asia/india/2008/05/05/155047/India-urged.htm** (visited May 7, 2010).

[55] "U.S. Imports from China by 5-digit End-Use Code 2005-2009" (U.S. Census Bureau), on the Internet at **www.census.gov/foreign-trade/statistics/product/enduse/imports/c5700.html** (visited May 7, 2010).

[56] Anand Giridharadas, "India, Known for Outsourcing, Expands in Industry," *The New York Times*, May 19, 2006, on the Internet at **www.nytimes.com/2006/05/19/business/worldbusiness/19factory.html** (visited May 11, 2010).

[57] "U.S. Imports from India by 5-digit End-Use Code 2005-2009."

[58] This information was obtained from *The National Strategy for Manufacturing*, p. 20; the original source is listed as "Learning from China to unlock India's manufacturing potential" (CII-McKinsey, October 2002). McKinsey & Company undertook a study on behalf of the Confederation of Indian Industry (CII) in March 2002. The objective was to understand the drivers of Chinese competitiveness in manufacturing and identify how India could put its manufacturing sector on the path to high growth. BLS estimates indicate that in 2002 hourly compensation costs in China were 22 percent lower than those in India, as shown in Chart 9. For reasons described in this article, estimates from China are not *directly* comparable with those from India.

[59] *The National Strategy for Manufacturing*, 3.3.2, p. 20.

[60] *Ibid*, 4.2.2.12, p. 64.

[61] *Statement 10. Summary of macro economic aggregates*.

[62] Geeta Anand, "India's Infrastructure Funds Fall," *Wall Street Journal*, Apr. 28, 2009.

[63] Sobia Khan, "NHAI's new bid norms may speed up road projects," *The Economic Times*, Mar. 13, 2010, on the Internet at **http://economictimes.indiatimes.com/news/economy/infrastructure/NHAIs-new-bid-norms-may-speed-up-road-projects/articleshow/5678094.cms** (visited May 11, 2010); and "NHAI to invite fresh bids for 38 projects," *Business Standard*, Apr. 15, 2009, on the Internet at **www.business-standard.com/india/news/nhai-to-invite-fresh-bids-for-38-projects/58608/on** (visited May 11, 2010).

[64] John Lee, "Don't Underestimate India's Consumers," *BusinessWeek*, Jan. 21, 2010, on the Internet at **www.businessweek.com/print/magazine/content/10_05/b4165084462859.htm** (visited May 7, 2010).

[65] At the time this article was published, the CSO had released data from ASI 2006–07 and ASI 2007–08.