

## **Labor Productivity: The Long and the Short of It**

**By Patrick McCarthy**

Labor productivity is an important barometer of an economy's performance. Increases in labor productivity mean that unit labor costs are decreasing whereas falling labor productivity indicates a rise in unit labor costs. And these changes in productivity and costs have important implications for how well the nation or an industry or a company competes with its domestic and international competitors.

The Bureau of Labor Statistics routinely produces two types of productivity estimates, labor productivity and multifactor productivity. And the Bureau's Division of Productivity Research and Program Development (<http://www.bls.gov/dpr/>) continually strives to improve reported productivity statistics and our understanding of the sources and effects of productivity and productivity change.

Here, I will discuss labor productivity. For a discussion of multi-factor productivity, please see CPBIS's February 25, 2016 Newsletter.

What is labor productivity? – As reported by the BLS, labor productivity is the amount of real output that labor produces in an hour. And labor productivity growth is the difference between the growth rate of output and that of labor hours. For example, if US real output increased 5% and labor hours increased 3% over the same period, then labor productivity increased 2%.

Unit labor cost is dual to labor productivity – Key to the success of any economy or business is reducing the number of labor hours that is required to produce one additional unit of output. Given its capital investments and technology, International Paper and Georgia Pacific, for example, seek to use as few labor hours as possible to produce one additional ton of paper. But in driving DOWN its labor hours per ton of paper, the

companies drive UP their output per labor hour, its labor productivity. Thus, labor productivity growth is equivalent to unit labor cost reductions.

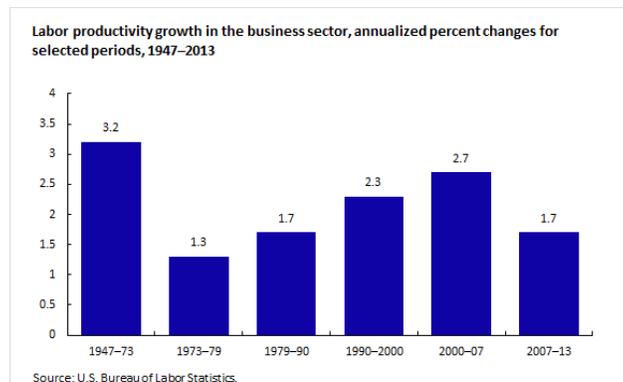
Long term and short term productivity – Whether produced by the BLS, trade associations, or individual companies, labor productivity and productivity growth can reflect long term trends over several years or decades as well as short term changes that reflect the past quarter or past year.

Productivity growth over the long term is critical to a nation's ability to produce more goods and services with the same amount of labor. Further, these productivity increases generate higher profits and support non-inflationary wage growth, increasing household incomes and consumption. Sustained long term productivity growth can simultaneously grow profits, incomes, and tax revenues leading to higher standards of living.

Short term productivity growth reflects recent economic performance and can indicate a cause for concern or a reason for staying the course. But in the short run, understanding movements in productivity and its components (output and labor hours), how these change during expansions and contractions, and whether changes in output lag or lead changes in labor hours is crucial. During an expansion, for example, if a change in quarterly output leads changes in labor hours, then for that quarter productivity will be seen to rise (and unit costs fall). But as companies 'catch up' in the next quarter to the increased output by increasing labor hours (hiring more workers, for example), productivity will be seen fall relative to the last quarter. Understanding the relationships between labor productivity, unit labor costs, long term trends short term cyclical behaviors in these measures will go a long way to help companies sustain a growth and profitable business strategy.

## Long Term Productivity Growth

Consider the following bar chart which depicts annual labor productivity growth rates over different long terms periods.



In the quarter-century between 1947 and 1973, labor productivity increased by 3.2% annually, a healthy increase in the nation's ability to increase output with its labor resources. But during the oil crises of the 1970s, labor productivity collapsed to 1.3% and only slightly recovered to 1.7% in the following decade (1979 – 1990). Yet the trend was positive as seen in the bars from 1973-79 through 2000-2007, right before the onset of the financial crises and the great recession. Peaking at an annual rate of 2.7% in 2000-2007, growth in labor productivity fell to 1.7% as the great recession took its toll on employment and output and the recovery hat has been slow.

Although labor productivity growth has the potential to simultaneously increase wages and corporate profits, there is no requirement that this occur, which underlies current con from the Bureau of Economic Analysis depicts employee compensation as a share of gross domestic product and documents the long term decline from a high of 51.7% in 1970 to 42.1% in 2011.



Source: Federal Reserve Bank of St. Louis, <https://fred.stlouisfed.org/series/W270RE1A156NBEA>

## Productivity Growth in the Paper Sector

The BLS recently reported long term (1987 – 2015) and short term (2014-2015) labor productivity for major industries. The table below gives the annual percentage change in labor productivity and unit labor costs for the paper sector.

	1987 - 2015	2014 - 2015
<b>Labor Productivity</b>	1.1	7.1
<b>Unit Labor Costs</b>	2.4	-1.5
<b>Output</b>	0.3	3.7
<b>Hours Worked</b>	-0.8	-3.2
<b>Labor Compensation</b>	2.8	2.1

Source: BLS, Economic News Release, <http://www.bls.gov/news.release/prin1.nr0.htm>

In the table we see that the industry experienced 1.1% long term productivity growth, substantially lower than the nation's annual growth, as reflected in the bar chart above. The 1.1% reflects the difference between an annual 0.3% increase in output and a 0.8% decrease in hours worked due at least in part to capital investment and new technologies. At the same time, we see that labor productivity growth was much less than the growth in labor compensation and this drove up unit labor costs at an annual rate of 2.4%.

More recently, on the other hand, we see that short term labor productivity grew 7.1% during the past year, consistent with an improving economy. The large growth in productivity resulted from a 3.7% increase in output combined with a 3.2% decrease in hours worked. Further, since growth in labor productivity (7.1%) outstripped growth in labor compensation, we see in the second column that the sector's unit labor costs fell 1.5%. These short term cyclical changes over the span of the business cycle will revert to the sector's long term growth trends.

Just as labor productivity and unit labor costs are important indicators for the economy, long term and short term measures of productivity growth and its components give industries and companies important insights on the effects and the effectiveness of their business mode

## **New CPBIS Report on Economic Indicators**

CPBIS has recently made available a new benchmark report (“Pulp and Paper Economic Indicators: A Comparative Analysis” by Patrick McCarthy and Aselia Urmanbetova). The 2014 annual report updates the benchmark analysis that CPBIS distributed last year and includes additional benchmark indicators. As in last year’s report, the 2014 report includes information on major economic indicators, including industrial production, capital stock and investment, employment and productivity, and price indices. This year’s benchmark update expands the information on energy indicators and includes new data on biofuels. In addition, this year’s report includes indicators on transportation and trade.

*Where is THAT information?* This year’s CPBIS Benchmark Report is nearly twice the length of last year’s report, reflecting the expanded coverage of information relevant for the industry. In contrast to many other industry reports and benchmark analyses, a major advantage of the CPBIS report is that all data come from public online sources and, importantly, include specific source citations. Although public data are ‘public’, actually locating the specific public data can be time-consuming and cumbersome. The report’s detailed source information enables one to quickly and easily navigate to the specific webpage that provides the data as well as other data relevant to the topic.

The 2014 CPBIS Report, “Pulp and Paper Economic Indicators: A Comparative Analysis”, is available for \$70 on the CPBIS website.

(<http://www.cpbis.gatech.edu/support/products>).

## **Trend Indicators from Industry Intelligence Inc.**

[Industry Intelligence Inc.](http://www.industryintel.com) has provided market intelligence to more than 600 companies worldwide since it began as Forestweb in 1999. Industry Intelligence delivers a daily report featuring news of the paper and forest products industries. For your subscription visit: <http://www.industryintel.com>

Below is a small sampling of recent Industry Intelligence headlines, chosen to mirror significant trends in and around the paper and forest products industries.

*The National Science Foundation has awarded a \$741,221 grant to cycleWood Solutions Inc., a technology company affiliated with the University of Arkansas, to commercialize single-use Xylobag – a plastic bag substitute that blends lignin, an abundant organic polymer that is most commonly derived from wood, with a compostable material.*

Lignin is a byproduct from paper mills and biofuel plants, so no additional trees or plants need to be harvested to produce Xylobags. The bag has been certified compostable by the Biodegradable Products Institute and will break down in as little as 12 weeks in a commercial composting facility. The National Science Foundation Phase II grant came through the Small Business Innovation Research Program, which allows federal agencies to stimulate technological innovation in the private sector by strengthening small businesses that meet federal research and development needs. The program is intended also to increase the commercial application of federally supported research results.

*Ever since the first article on the topic in 1975, the “paperless office” is always 10 years away. With demand for paper steadily decreasing, with most paper bills turning into e-bills, and companies and government offices striving for “paperless paperwork”, the average American still uses 700 pounds of paper products a year.*

The Economist’s article The Paperless Dilemma zeroes in on a single factor – easier consumption – once compiled and collected, saved and organized in electronic media, information and other creative inputs are easier to consume, understand, and process once they are printed out. This is due primarily to the human physiology of reading.

*Sustainable Manufacturing and Advanced Biobased Materials are the two categories of technological need and opportunity identified by Agenda 2020 Technology Alliance announcing the launch of its new project, “Technologies for Advanced Manufacturing of Pulp and Paper Products.”*

The project leverages extensive work by Agenda 2020 members and partners over the last year to identify and screen opportunities for major reductions in energy consumption and treated water discharges. The process will begin with open-forum sessions in Atlanta and Chicago: the Atlanta event will be held November 18. [Registration and Hotel for Atlanta Open Forum](#). The Chicago event is scheduled December 10. [Registration and Hotel for Chicago Open Forum](#).

***China imposed preliminary duties on imports of dissolving pulp from Canada of 13 % in November of 2013 and in April of 2014 they became permanent. These anti-dumping duties are resulting in significant loss of market for Canadian dissolving pulp producers.***

“This trade action has had a negative impact on several forest communities.” said David Lindsay, President and CEO of FPAC. “Not only has this action had a negative impact on several forest communities across Canada, and hurt Canadian exports, but future jobs have also been impacted with the cancellation of previously-announced investments in dissolving pulp opportunities in Saskatchewan, Quebec, and Terrace Bay, Ontario.”

***India’s paper industry, rooted in its ancient history, is poised for stable long-term growth.***

India has 17% of the world's population, but it consumes just about 3% of paper globally. The per capita consumption of paper in India is at around 10 kg, which is well below the global average of 55 kg. With the growth in GDP and increase in literacy, paper consumption in India is forecasted to go up. Consumption of paper and related products in India is set to increase to 20 million tonnes by 2020, from the current level of 12 million tonne.

***In its effort to protect PanPaper mill at Webuye, Kenya reintroduces higher import duty of 25% on paper, paperboard not made in East Africa Community countries.***

Pan Paper in Kenya reportedly bought by Raiply for US\$1; thought that at least a year of renovation work is needed before the brown kraft paper mill could reopen.

***APP China's chimneys do not release black smoke but purified steam and the polluted water is treated to the level of purity in which fish can survive.***

In fact, the whole factory area looks like a park with green trees and a fresh water fed from a creek in a mountain. "We spend 2.7 billion yuan (\$440.7 million) on the environment protection facilities in the factory," said Anthony Chang, president director assistant with Hainan Jinhai Pulp and Paper Co, a paper producer with APP. By the end of 2012, APP China had spent over 6 billion yuan in environmental protection facilities across the country.

***European corporate leadership is mindful of climate policies and social responsibility: Metsä Board is honored to be awarded a position in the CDP's Nordic Climate Disclosure Leadership Index (CDLI). Metsä Board achieved an excellent score of 98 out of 100 for***

***the depth and quality of climate change data it discloses to investors and the global marketplace.***

High scores indicate that a company provides robust climate data and conveys a strong understanding of corporate climate-related issues. Only companies with a score in the top 10% are awarded a position in the CDLI, showing they have provided a high level of transparency in their disclosure of climate-related information.

***Wisconsin’s paper industry is probably done with changes and consolidations, said Jeff Landin, president of Wisconsin Paper Council. Currently, there are more jobs available in Wisconsin’s paper industry than there are graduates to fill them – a large number of people in technical jobs are reaching retirement age.***

In the past two years, Domtar Corp.’s paper mill in Rothschild, Wisconsin, hired 32 production employees and 10 salaried administrators, all of which replaced retiring workers. Demand is high and growing for workers in skilled trades, with demand especially high for electrical engineers, as there are fewer and fewer graduates in this field, however, younger workers are shying away from the industry because it is not perceived to be as secure. They also are not as interested in working 24-hour shift rotations.

***High drama around the anticipated closure of Verso's Bucksport paper mill in Maine: mill closure spurred emotional outbursts and finger-pointing during Maine's governor race.***

All three candidates vying for the governor’s seat in Maine released statements containing words "traumatic," "help" and "heartbreak." Verso is blamed for not alerting the local officials of its decision ahead of time and for disregarding all the help it received from the state and local governments in the forms of tax breaks and credits over time. The company is asked to stall closure and seek a buyer who would be able to keep the mill running or, at minimum, to keep the mill-adjacent energy center operating and providing energy to the local community. The closure is symptomatic of rising natural gas costs in the Northern region and is the third mill closure this year for Maine. 500 people will be affected directly by the closure.

## ***Paper Quotes***

“Most important are the nearly 900,000 men and women who make these products and manage the forests manufacturers rely on, without which we would not enjoy the quality of life that paper and wood products give us. To them, we say ‘thank you.’” – Donna

Harman, American Forest & Paper Association President and CEO, in celebration of National Forest Products Week, as proclaimed by President Barack Obama.

“As a top employer in 48 states, pulp and paper is very important to many communities across the U.S,” Turpin continued. “Developing its processes for even greater energy efficiency and additional reductions in environmental impacts will protect US jobs and promote energy efficiency and independence.” — David Turpin , Agenda 2020’s President and Executive Director.

### Statistics Corner: Destinations of Recovered Paper

The supply of recovered paper showed a slight increase in 2013, rising from 78,498 million tons in 2012 to

78,954 million tons, according to AF&PA. During the same period, the amount of recovered paper and paperboard experienced a small decrease from 51,092 to 50,128 million tons which led to a fall in the recovery rate from 65.1% in 2012 to 63.6% in 2013. Fueling the decline was a 6.3% decline in US recovered paper US exported.

The graph below identifies the destinations of recovered paper consumption in 2013. Sixty percent of recovered paper goes into the production of other products, the largest component of which is containerboard (32%), followed by boxboard (12%), and tissue (9%). International trade in recovered paper accounts for the 40% in the form of net exports to China and other importing countries.

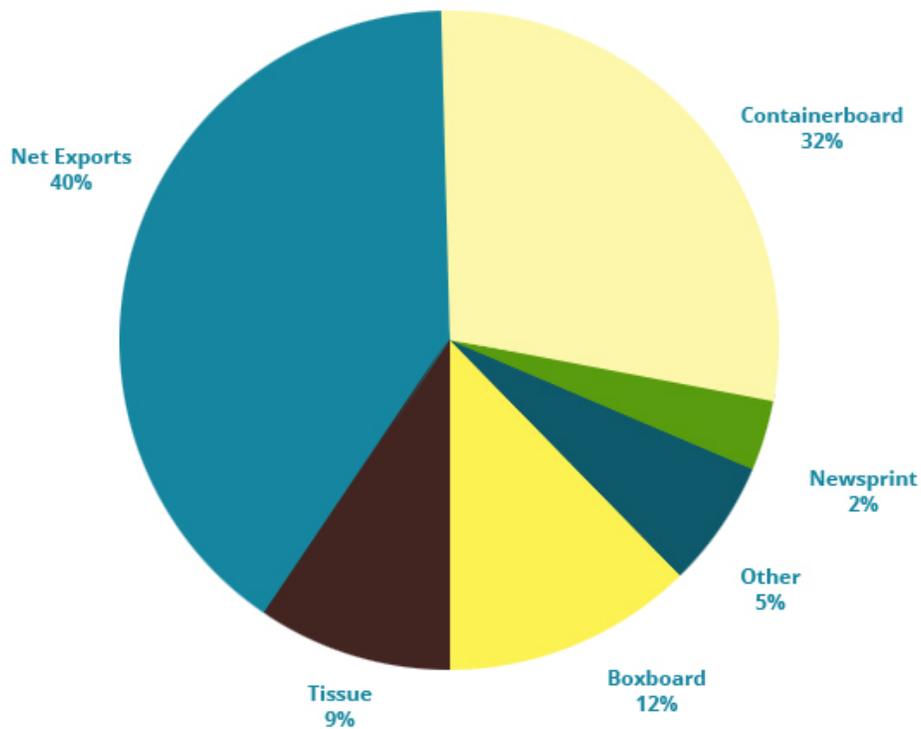


Figure 1. Destinations of Recovered Paper (Source: AF&PA)

<http://www.paperrecycles.org/statistics/>