Understanding Productivity: The Key to Lower Cost and Higher Profits in the Printing Industry

By Dr. Ronnie H. Davis

Senior Vice President and Chief Economist
Understanding Productivity:
The Key to Lower Cost and Higher Profits in the Printing Industry

Today’s printing industry is a capital-intensive business that is a hybrid of production, distribution, and ancillary services. In this paper, we examine the relationship between productivity and profitability in print. Independent industry data\(^1\) for sheetfed commercial printers covering primarily commercial and advertising, direct mail, and packaging has been used in this white paper, while the budgeted hourly rates are from an industry accepted source\(^2\).

First, let’s define productivity from an economic perspective. Productivity is the connection between inputs (resources used to produce a good or service) and outputs (the quantity of goods or services produced). Productivity goes up if we can produce more output for the same amount of inputs or produce the same amount of output with fewer inputs.

In the printing industry, typical economic metrics for productivity are sales per employee, sales per factory employee, or value added per employee or factory employee. For this white paper, let’s focus on the value-added component. A comparison of these metrics for sheetfed printers (Figure 1) dramatically demonstrates how much more productive profit leaders (printers at the top quartile of profitability) are than those with profit potential (printers at the lower quartile of profitability). For example, profit-leading printers produce in excess of 44 percent more value added per production worker than those with profit potential.

![Figure 1: Value Added per Factory Employee](image_url)
It is important from a business’s perspective to understand what underlying reasons for this differential. A vital reason for this competitive advantage in productivity is the difference in machinery and equipment per factory employee. Data indicates that high-profit printers are much more likely to substitute capital for labor (Figure 2). In fact, high-profit printers have almost double the investment per factory employee compared to low-profit printers.

![Investment in Machinery per Factory Employee](image)

*Figure 2: Investment in Machinery per Factory Employee*

Why is capital investment an important factor in profitability? Higher investment on the factory floor equates to less labor in the factory. Indeed, high-profit printers use approximately 30 percent fewer factory employees per million dollars of sales (Figure 3). For comparison purposes, a $10-million profit-leading printer would have 17 fewer factory employees than a printer with profit potential. This reduction in staffing significantly impacts the profitability of the printer.
This comparative focus on equipment and efficiency allows high-profit printers to achieve a significant reduction in direct labor cost as a percentage of value added with a savings of around 7 percent (Figure 4).

It is important to understand how this lower cost is achieved. The cost to manufacture an item is comprised of material costs, cost to produce it (budgeted hourly rate or BHR), and how many of the item can be produced over a period of time (productivity). Let’s consider a simple case of two manufacturing scenarios for the same item. The first has a BHR of $300 and net productivity of 1000 items per hour, while the second has a BHR of $360 and net productivity of 1500 items per hour. In the first case it costs $0.30 per item, while in the second it costs $0.24 per item. The
second manufacturing scenario, while at a higher BHR, has a lower manufacturing cost. This example clearly demonstrates that both BHR and productivity should be considered in tandem when evaluating your manufacturing costs.

Now, let’s examine in more detail the connection between the cost of equipment (in this case a press), the BHR, and press productivity. In general, the depreciation and finance cost of a new press makes up between 20 to 35 percent of budgeted hourly rates. The remainder of the BHR is composed of manufacturing labor, other manufacturing costs, and sales and administrative costs. On this basis, higher equipment costs translate to only approximately a 6- to 10-percent increase in BHR depending on the factors above. This could be considered a significant difference in a competitive industry like printing. However, this difference is significantly impacted by any productivity difference in equipment as indicated above.

In the example for a typical two-shift operation, a 25-percent premium in equipment costs is equalized by an 8.75-percent difference in equipment productivity, a factor defined as the *productivity equalizer*. In general, productivity is three times more important than price differential between equipment. Therefore, in this case, at any productivity difference above 8.75 percent, the business would reduce costs and increase profitability despite paying 25 percent more for the equipment.

![Figure 5: Productivity Equalizer—Relationship Between Difference in Percentage Equipment Price and Press Performance](image-url)
The bottom line is that productivity driven by automation, innovation, and technology-embedded equipment drives down costs and increases financial performance. The key to managing this complex process is to understand the dynamics of the interactions better than your competitors.

References

1. Printing Industries of America’s *Dynamic Ratios* for printers that are primarily general commercial sheetfed printers but also use other processes such as digital and inkjet.

2. Cost Rates Advisors, Profectus