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For the Record:

President Bush signed off on a tariff for imported steel and Indiana lawmakers recently passed a bill providing a special tax break for northwest Indiana's steel mills. These protective acts by federal and state government are clear indications of the importance of the high-paying jobs in the steel industry, even while the number of those jobs is shrinking. In his article, *The State of Steel,* Professor Don Coffin of Indiana University Northwest documents the evolution of the steel industry in this country from the latter decades of the previous century through today. His analysis focuses on competition and concentration in the steel industry. The lessons of the nation can surely be applied to those in Indiana, which will be the focus of a future article by Coffin.

Taxes and what they pay for are discussed by economist and Kelley School of Business senior lecturer Jim Smith, while IBRC demographer John Besl provides highlights of the latest Indiana county population estimates. As always, the *Indiana Business Review* can also be read online at www.ibrc.indiana.edu/ibr.

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The State of Steel

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The steel industry continues to be of major interest to Indiana, given its long history as one of the primary sources of employment and income in the state. But steel has long been a declining source of employment and income, both for northwest Indiana and for the nation. Nonetheless, given its continued real importance as an employer and its symbolic importance as the source of much of northwest Indiana's growth, understanding the current state of the steel industry has value.

As recently as 1969, employment in the steel mills accounted for nearly 30 percent of total local employment in northwest Indiana, but only 0.8 percent in the U.S. as a whole. By December 2002, those percentages had declined to 8 percent in northwest Indiana and less than 0.2 percent in the nation. Although this is not a totally legitimate comparison (value added in steel relative to Gross Domestic Product would be more appropriate, but such data are not readily available), the total value of steel output in 1969 was $70.9 billion, compared with a GDP of $3,492 billion (2.1 percent), while in 1998 steel output was valued at $37.6 billion, compared with a GDP of $8,508, or 0.4 percent (all values are in 1996 dollars).

Changes in the health of the steel industry nationally can be expected to drive changes locally, and understanding the national setting has clear importance. Looking initially at the extent of competition in the U.S. steel industry, we will note the transition from an oligopoly to a competitive global industry. We will examine capacity, output, and output utilization trends. We will see how prices have changed over time relative to prices in general. We will consider how changes in price, national income, and the prices of competing products have affected the demand for U.S.-produced steel. We will consider how the steel industry has been restructuring, and we will close with a look at the future of the steel industry. Our primary concern is to describe these changes in detail, rather than undertake a search for their causes.

The Extent of Competition

Competition within an industry has important consequences. The greater the extent of competition, the greater the pressures on firms to operate efficiently, the less control firms have over price, and the lower the average rate of profit is likely to be. We generally have two measures used to indicate the extent to which an industry is competitive: concentration ratios, which measure the share of the market that belongs to the largest firms, and the Herfindahl-Hirschmann Index (see inset).

In 1970, the steel industry was difficult to classify, but it was not highly competitive (see

Measures of Competition

Four-Firm Concentration Ratio (4FCR)

- 4FCR is the combined market shares of the four largest firms.
- A ratio in excess of 50 percent indicates that the industry is an oligopoly.
- A 4FCR less than 20 percent is indicative of a highly competitive industry.

Eight-Firm Concentration Ratio (8FCR)

- 8FCR is the combined market shares of the eight largest firms.
- A ratio in excess of 75 percent indicates that the industry is an oligopoly.

Note: Concentration Ratios and Herfindahl-Hirschmann Index from *Concentration Ratios in Manufacturing*, U.S. Bureau of the Census (Washington, D.C.: 2001).

The Herfindahl-Hirschmann Index (HHI)

- HHI accounts for a weakness in the use of concentration ratios, giving more "weight," or importance, to the largest firms in an industry. For example, in one industry the four largest firms each have market shares of 20 percent, so the 4FCR is 80 percent. In the second industry, the 4FCR is also 80 percent, but the market shares are 65 percent, 5 percent, 5 percent, and 5 percent. Clearly, the second industry is less competitive than the first.
- An HHI greater than 1,800 indicates that an industry is an oligopoly.
- An HHI less than 1,000 is indicative of a highly competitive industry.

Table 1
Concentration of the Steel Industry

Measure	1970	1997
4FCR	54%	39%
Adjusted for Imports	47%	28%
8FCR	75%	60%
Adjusted for Imports	65%	43%
HHI	1,102	560

Note: The concentration ratios were multiplied by the domestic production share of domestic consumption to account for the importance of imports. In 1970, this share was 87 percent; in 1997, it was 71 percent. No adjustments were made to the HHI, as it would be necessary to have data on the distribution of imports among non-U.S. producers in order to make an adjustment.

Table 1). The four largest firms—U.S. Steel, Bethlehem Steel, Republic Steel, and National Steel—probably had some degree of market power and some ability to use price as a competitive weapon. By 1997, competition in the steel industry had increased substantially, even without accounting for import competition. The steel industry in the U.S. is now substantially competitive, with no firms having any significant control over price.

Table 2
U.S. Steel Production, Exports, and Imports in Thousands of Short Tons

Imports Grew 37,000%

Year	Domestic Production	Exports	Imports
1949	69,192	5,910	112
1959	62,124	6,919	n/a
1969	93,887	5,299	14,034
1979	100,300	2,800	17,500
1988	102,700	2,100	20,000
1998	102,400	5,500	41,500

Source: *Statistical Abstract of the United States*, 1950, 1960, 1970, 1980, 1990, and 2000

Capacity, Utilization, and Output Trends

Following World War II, the U.S. steel industry dominated the world. Imports into U.S. steel markets were essentially nonexistent, following the destruction of much of the steel-making capacity in Germany and Japan. A significant proportion of U.S.-produced steel was exported. Between 1950 and the end of the twentieth century, domestic steel output grew by about 48 percent. Imports, however, grew by 37,000 percent. Between 1970 and 2000, they grew by 196 percent. Domestic production grew by less than 10 percent during those three decades. U.S. dominance in steel ended by 1970 and domestic purchasers of steel have become increasingly reliant on imported steel (see **Table 2**).

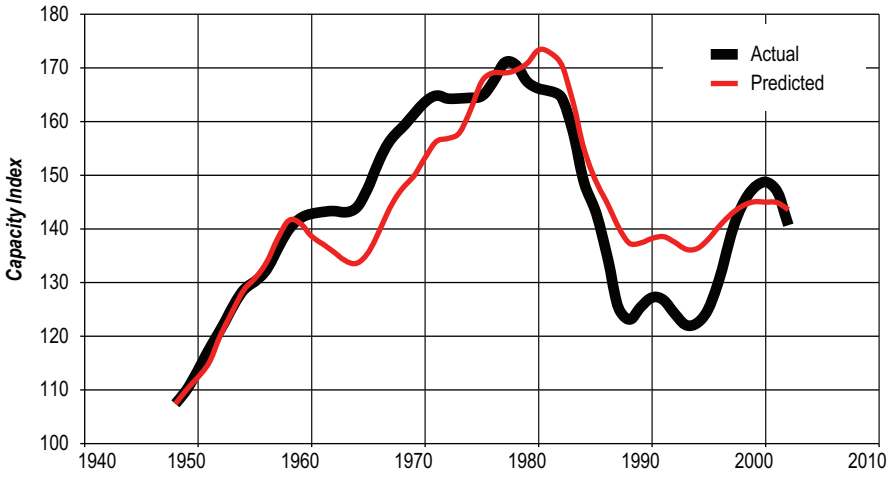
Not surprisingly, production capacity in the U.S. also increased in the post–World War II period, as shown in **Figure 1**. Based on a U.S. Department of Commerce capacity series on the U.S. iron and steel manufacturing industry, the industry's capacity in 1948 was about 107 percent of its pre–World War II (1939) capacity. Production capacity grew irregularly, but steadily, until 1977, by which time capacity had increased nearly 60 percent over its 1948 level. Note that capacity grew slightly faster than output (0.7 percent per year for capacity compared with 0.6 percent per year for output). Since 1977, capacity has declined to about the same level as in 1959, which is roughly 30 percent above its 1948 level.

Increased Capacity

What drove this increased capacity? Both the domestic and world markets for steel expanded in the post–World War II period, so much of the explanation can be found in demand. The economic theory of investment suggests that firms will expand their capacity more rapidly when desired capacity is above actual capacity. One measures this by examining the relationship between capacity utilization and capital investment, measured here as the percentage increase in capacity. As capacity utilization increases, firms are likely to conclude that the optimal amount of capital is also increasing, and respond by increasing their investment in new plants and equipment. If capacity utilization falls, pressures on firms to invest in new capacity will diminish. If capacity utilization falls enough, firms will deliberately allow their capacity to shrink by retiring older facilities and not replacing them.

How well does this theory work in the case of the steel industry? Empirically, we would expect completed investments to respond to changes in capacity utilization with a lag, allowing time for construction, for example. **Figure 1** also shows predicted capacity, in which we predict the percentage change in capacity using last year's capacity utilization, and capacity utilization two years ago, including a time trend.[1] Predicted capacity tracks actual capacity reasonably well, indicating that firms responded reasonably quickly to demand pressures in making investments or disinvestments. It appears that capacity utilization below 70 percent leads fairly quickly to shrinking capacity and that capacity utilization above 80 percent leads, also quickly, to investments designed to increase capacity.

Figure 1
U.S. Iron and Steel Manufacturing Capacity, 1948–2002



Determining Capacity Utilization

What determines capacity utilization? Other things equal, increasing output (particularly in steel-consuming industries) will lead to increased purchases of steel and thus to increasing capacity utilization. **Figure 2** charts actual and predicted capacity utilization. It is worth noting how volatile capacity utilization was in the 1950s, with sharp declines in 1949, 1952, and 1959, as a consequence of strikes. Since 1960, the important declines in capacity utilization have been associated with recessions (1971, 1975, 1991, and 2001) and with the protracted crisis in the steel industry

in the early 1980s (which was also associated with the double-dip recessions of 1979 and 1981–1983).

Predicting capacity utilization is relatively straight-forward. We used measures of total and industrial output (for the 1959–2001 period) and a time trend to generate the predicted capacity utilization[2] shown in **Figure 2**. Again, the prediction tracks actual capacity utilization fairly closely, while tending to be somewhat less volatile.

Domestic output (see **Figure 3**) has increased since the end of World War II, albeit not smoothly. Recessions and strikes have cut into production with some regularity, with large declines in output occurring in 1949, 1959, 1971, 1974–75, and 1979–82 (when steel output fell by about half over a three year period). Between 1982 and 2000, output recovered by about 50 percent (but from a lower base), leaving industry output in 2000 about 25 percent to 30 percent below its late-1970s peak.

The Average Price of Steel

Figure 4 shows how an index of steel prices changed relative to an index of all producer-goods prices.[3] A decline in this index indicates that steel mill product prices were falling relative to all producer goods prices, meaning they either fell more rapidly or rose more slowly than other goods. In the 1940s, steel mill product prices rose substantially less rapidly than did the prices of all producer goods. During the 1950s, steel mill product prices rose more rapidly. The 1960s were a period during which steel mill product prices and all producer goods prices rose at about the same rate. Except for the recession of 1974–75, the 1970s were again a period during which steel mill product prices rose more rapidly. Between March 1947 and January 1979, prices of all producer goods roughly tripled, on average. Prices of steel mill products rose by a factor of 6, about twice as fast. (Prices of "All Metals" rose by a factor of about 4.5, so steel products rose substantially faster than did the prices of other metals, including aluminum.)

To the extent that other metals, or other products like glass or plastics, could be substituted for steel, this long period of rising relative steel prices probably created a more difficult competitive environment for steel producers. While rising prices relative to

Figure 2
Capacity Utilization in U.S. Iron and Steel Manufacturing, 1948–2002

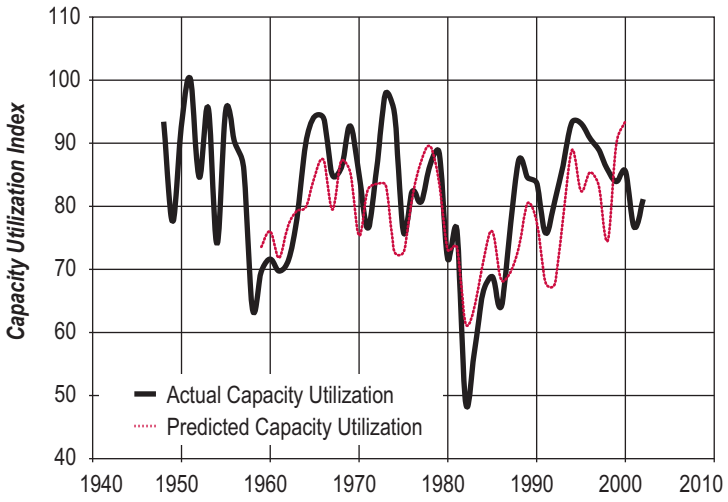


Figure 3
Index of U.S. Iron and Steel Output, 1948–2002

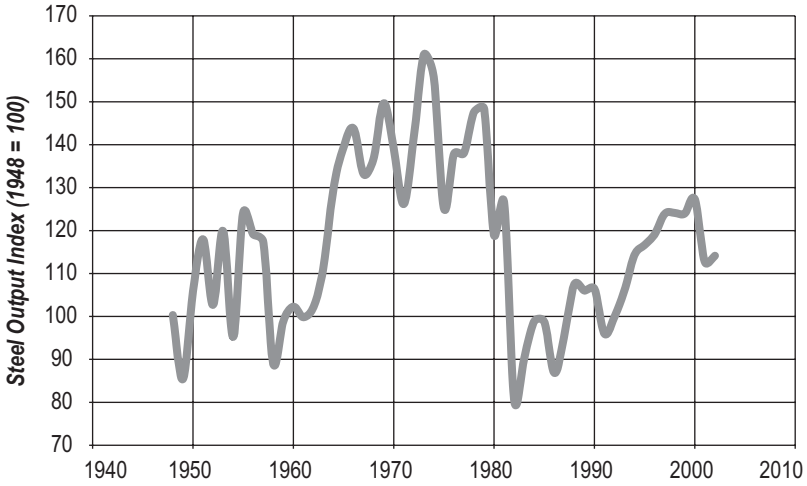


Figure 4
Price of Steel Mill Products Relative to All Producer Goods, 1939–2002

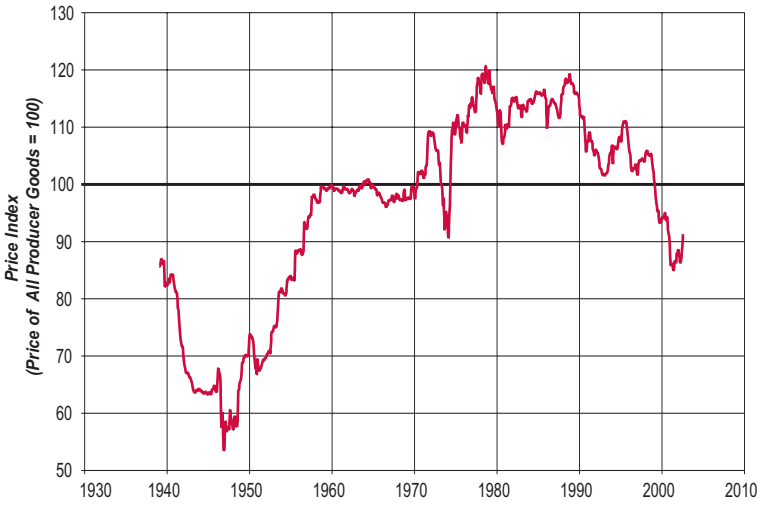
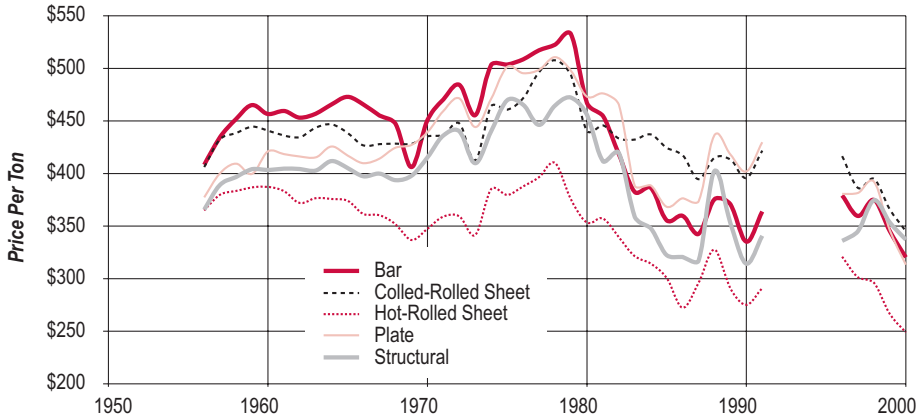


Figure 5
Prices of Various Types of Carbon Steel, Deflated by the PPI for All Commodities



Note: Nominal prices are deflated by the Producer Price Index for all commodities. This price series is not available for as long as the PPI for steel mill products. Data for 1959–1964 are from Robert Crandall, *The U.S. Steel Industry in Recurrent Crisis: Policy Options in a Competitive World*, The Brookings Institution (Washington, D.C.: 1981). Later years are from a U.S. Department of Commerce report, *Steel Mill Products* (MA-33B). Prices are FOB (Free on Board). We were unable to obtain copies of the report for 1992–1995, hence the gap in the price record.

A second interesting factor is the inverse price spike once the tariffs expired in 1975, with domestic producers not responding very much to that either.

More recent price data show significant price increases across most types of steel beginning in March 2002, with the reimposition of tariffs. Prices averaged across nine categories of carbon steel increased by 26 percent between February 2002 and February 2003; prices of two grades of stainless steel increased by 27 percent in the same period, according to MEPS International. This is remarkable given the declines in steel prices that occurred in previous years and the overall weakness of the world economy.

competing products may have a short-term benefit for producers, the long-term consequence is increased substitution of competing products by buyers.

Since 1980, steel prices have risen more slowly than have other producer goods prices and were, by 2001, about back to their (relative) 1939 level. There were price "upticks" in the 1990s, corresponding to periods of import restrictions.

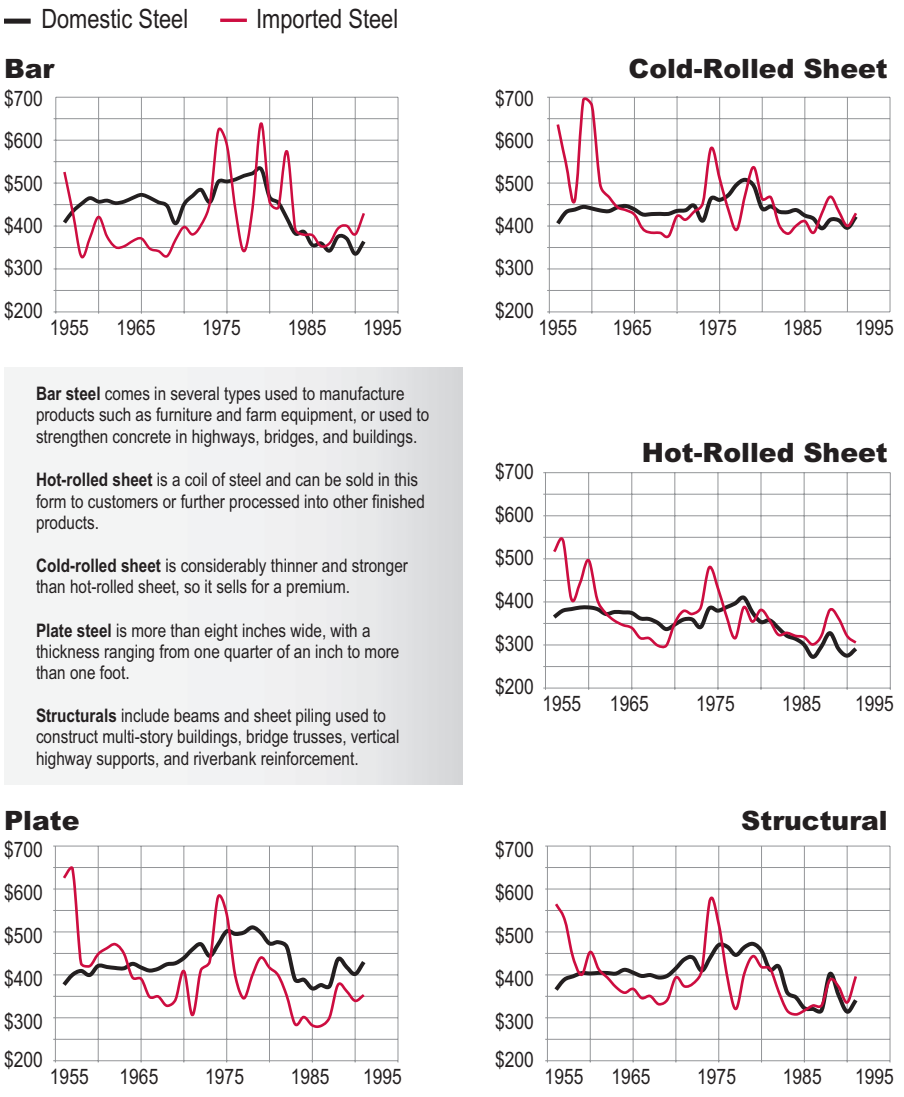
Prices for Specific Steel Products

Prices of individual steel products have tended to move together (see **Figure 5**). The movement of domestic and import prices (see **Figure 6**) is important in understanding the changing competitive position of domestic producers because steel purchasers will tend to shift their purchases toward imports when domestic prices rise relative to import prices and vice versa.

In the absence of non-competitive markets or some specific factors, such as persistent quality differences or differences in ability to meet delivery timelines, we would expect domestic and import prices to converge. In fact, domestic and import prices have tended to move more in concert and be closer together in the 1990s than earlier. In light of the increasingly competitive nature of the U.S. market for steel, this is hardly surprising.

All import prices show substantial volatility in the mid to late 1970s. This was associated with the imposition of temporary import tariffs in 1974 and 1978. The most interesting aspect of these two import price spikes is that domestic producers did not raise their prices in concert.

Figure 6
Price Per Ton for Specific Domestic and Imported Steel Products, 1956–1991



Bar steel comes in several types used to manufacture products such as furniture and farm equipment, or used to strengthen concrete in highways, bridges, and buildings.

Hot-rolled sheet is a coil of steel and can be sold in this form to customers or further processed into other finished products.

Cold-rolled sheet is considerably thinner and stronger than hot-rolled sheet, so it sells for a premium.

Plate steel is more than eight inches wide, with a thickness ranging from one quarter of an inch to more than one foot.

Structurals include beams and sheet piling used to construct multi-story buildings, bridge trusses, vertical highway supports, and riverbank reinforcement.

Note: Product definitions are from the American Iron and Steel Institute.

Bankruptcy and Restructuring

Worldwide overcapacity and generally weak prices for steel have led a number of firms, both in the U.S. and in other countries, to face bankruptcy. One consequence of this in the U.S. has been a continued reduction in production capacity, with nearly 20 million tons of production capacity taken offline in 2001, according to a recent article in *Steel Technology*. In addition, a number of acquisitions have occurred in the past two years, as shown in **Table 3**.

These acquisitions have moved 38.3 million tons of capacity (nearly 31 percent of the existing U.S. capacity) from independent operation into larger combinations. ISG, which is a new steel producing corporation, has acquired (or plans to acquire) the assets and capacity of three bankrupt steel companies, totaling 20.1 million tons of annual production. This would make it the second largest steel producer in the U.S. (behind U.S. Steel, assuming U.S. Steel completes its acquisition of National).

Benefits of Consolidation

One of the primary justifications for such combinations, at least in the press, has been to take advantage of economies of scale. This is, however, a mistaken justification. Economies of scale occur in production when smaller production facilities are replaced by larger facilities. Economies of scale are not thought to occur when a company acquires additional, separate production facilities. While these consolidations may achieve managerial or financial savings, they are unlikely to produce any economies of scale in production.

Nonetheless, such acquisitions may lead to cost savings for quite different reasons:

- First, the combined firms may experience managerial efficiencies from reduced corporate staffing needs.
- Second, the effective capital costs may be significantly lower for acquiring firms. In the case of ISG, for example, their acquisition

Analyzing the Price of Hot-Rolled Sheet Steel

Economists emphasize that buyers respond to changes in the market conditions they face. In particular, buyers have some degree of sensitivity to changes in the price of steel, to changes in the prices of substitutes for steel, and to the demand for the products they produce. We will examine a specific steel product, hot-rolled sheet steel (HRS), a carbon steel product that accounts for nearly 20 percent of U.S. steel production.

By 2000 (inflation-adjusted using the Producer Price Index for all commodities), hot-rolled sheet steel prices for domestically-produced steel in the U.S. were around $250 per ton, their lowest level since the beginning of the data series we are using (see **Figure 5**). By February 2003, prices had increased to about $263 per ton.

If we compared the prices of domestic and imported hot-rolled sheet, we would want to ask two questions. First, if prices charged by domestic producers increase and nothing else important changes (including prices of imported steel), by how much would we expect sales by domestic producers to fall? Second, if the price of imported steel rises and nothing else important changes (including the price of domestically-produced steel), by how much would domestic-producer sales rise?

In order to answer these questions, we need to have an estimate of the demand for hot-rolled sheet steel. In a recent study, we estimated what that demand looks like using a log-linear model. The results of this analysis suggest that a 1 percent increase in the price charged by domestic producers will lead to reduction in domestic-producer sales of 0.69 percent and that a 1 percent increase in the price of imported hot-rolled sheet will lead to an increase in sales of domestically-produced steel of 0.41 percent. Thus, domestically-produced and imported hot-rolled sheet are very good substitutes for each other, so buyers respond in a comparable manner to a change in either price.

If prices of imported steel increase, then domestic producers have two alternatives. They can maintain their current prices and capture additional market share. This would allow them to increase capacity utilization and take advantage of any lowering of average costs associated with more intensive capacity utilization. Or instead, they can increase their prices, thus increasing their profit margins and their short-run profitability. Doing this foregoes an increased market share.

Buyers of hot-rolled sheet also significantly increase their purchases when industrial production increases. The demand estimate tells us that a 1 percent increase in industrial production leads to a 0.86 percent increase in sales of steel (holding steel prices unchanged). These estimates can become important in considering long-run output growth as industrial production changes and short-run policy options, such as import tariffs.

Table 3
Consolidation in the Steel Industry

Acquiring Company	Target Company	Annual Capacity (Millions of tons)	Date
Gerdau-AmeriSteel	Co-Steel	8.8	Sept. 2002
ISG	LTV	7.6	April 2002
	Acme Steel	1.2	Sept. 2002
	Bethlehem	11.3	Pending
Nucor	Auburn Steel	0.6	April 2001
	Trico	2.0	June 2002
Steel Dynamics	Qualitech	0.5	Sept. 2002
	Galv-Pro	0.3	Feb. 2003
U.S. Steel	National	6.0	Pending

of the assets of bankrupt firms has been at prices representing a small fraction of the book value of these assets. According to a study by Peter Morici, this may mean a cost advantage of as much as $100 per ton compared with newly-constructed integrated facilities.[4]

- Third, the acquiring firm may be able to renegotiate labor agreements to give it more flexibility in staffing. In the case of ISG's acquisition of LTV, for example, production rapidly returned to its former level with substantially fewer employees.
- Fourth, the acquiring firm may make wage or benefit concessions a condition of the acquisition. Again, ISG's acquisition of LTV and the conditions of its offer to acquire Bethlehem are informative. ISG has been able to shed much of LTV's existing pension obligations and retiree medical costs. Morici estimates the labor cost savings as approaching $100 per ton as well.

Such cost savings for acquiring firms will place additional pressure on workers at other firms, whether unionized or not, to accept changes in compensation levels and workplace practices in order to allow other firms to produce with a competitive cost structure.

Capacity reductions and consolidations are more in the nature of bandages, not long-term solutions. The steel industry needs resources to invest in new facilities and in new technologies. The issue is how to attract a sufficient amount of capital to an industry plagued by low rates of profit, bankruptcy, high costs, global overcapacity, and a slowly growing product market.

The Future of the U.S. Steel Industry

Both the U.S. economy and the world economy are likely to grow slowly over the next year or more. This means slow growth in demand for steel, lower than normal rates of capacity utilization, and, in all likelihood, continued reductions in capacity and more consolidations.

However, capacity reductions and consolidations by themselves are more in the nature of bandages, not long-term solutions. The steel industry needs to find the resources to invest in new facilities (retiring even more of its older capacity) and in new technologies. Fruehan estimated that the flat-rolled segment of the industry "must invest at least $7 to $9 billion… within three years at the outside… to remain competitive."[5] For the industry as a whole, the amount of investment required would be much greater.

The issue is how to attract a sufficient amount of capital to an industry plagued by low rates of profit, bankruptcy, high costs, global overcapacity (at least according to some), and a slowly growing product market. All these factors reduce the willingness of capital markets to commit resources to the steel industry. Even the presence of import restrictions, which are likely to boost prices (and profits) for U.S. steel firms, are temporary. In addition, these profits cannot be considered a long-term incentive to redirect capital from other more profitable industries. As a result, unless results from new investments can be seen quickly, the end of import restrictions will lead fairly quickly to lowered prices and profitability once again. The issue is how to provide permanent increases in returns to investments in the steel industry, and the answer is far from clear.

Even less clear is the possibility of the steel industry earning significantly larger than normal profits for the foreseeable future. As the industry has become increasingly competitive, prices and profits have inevitably declined. Even elimination of excess capacity in the industry seems unlikely to do more than eliminate losses and return the ability to earn a normal return on its assets. It is for this reason that the outcome of industry consolidation takes on significance.

Should the steel industry consolidate enough to re-create an oligopoly, it is more likely that firms in the industry could earn sustained levels of profit above a normal return on assets. However, the steel industry globally remains highly competitive, and will undoubtedly remain highly competitive even with the ongoing consolidation of U.S. firms. This continued global competitiveness does not provide much hope for the U.S. industry earning high rates of return.

What does the future hold? It seems obvious that steel employment will continue to fall, while steel output will, at best, rise slowly. Steel's importance in the U.S. economy will continue to decline. The marginally profitable nature of the steel industry, which is likely to continue in the absence of permanent import restrictions, will make financing new investments difficult. Steel, once an engine of growth for the U.S. economy, has little hope of once again taking center stage. ◄

Endnotes

[1] We regressed the percent change in capacity (%ChCap) on a time trend (YEAR) and on two lags of capacity utilization (LAGUTIL1 and LAGUTIL2) for the period 1950–2002, with the following results (t-statistics in parentheses):

%ChCap = 72.63 - 0.0447*YEAR + 0.111*LAGUTIL1 +
(2.32) (-2.85) (4.12)

0.0861*LAGUTIL2
(3.22) $R^2 = 0.607$

[2] We regressed capacity utilization (CapUtil) on a time trend (YEAR) and on real Gross Domestic Product (RGDP), real Disposable Personal Income (RDPI), an index of industrial production (IPROD), an index of manufacturing production (MPROD) and an index of automobile production (AUTOPROD) (t-statistics in parentheses):

CapUtil = 8,228.53 - 4.218*YEAR + 0.111*RGDP -
(1.41) (-1.40) (3.07)

0.0848*RDPI + 7.988*IPROD - 9.494*MPROD +
(-2.38) (2.76) (-2.75)

0.681*AUTOPROD
(3.57) $R^2 = 0.508$

[3] We obtained the monthly Producer Price Index for all commodities and the Producer Price Index for Steel Mill Products, for the entire run of both series. The index here is calculated as:
Relative Price Index = [(PPISteel)/(PPIAll)]*100.

[4] Information on consolidations is from Peter Morici, "An Assessment of Steel Import Relief Under Section 201 After One Year," March 2003, p. 16, www.steel.org/images/pdfs/MoriciPaper2003.pdf.

[5] Robert J. Fruehan, *Investments Required by the Flat-Rolled Steel Industry to Remain Competitive*, Public Exhibit 2 to Public Prehearing Brief of Bethlehem Steel, LTV Steel, National Steel, and U.S. Steel, September 10, 2001, International Trade Commission, as quoted in *USWA Proposals on Adjustment Actions*, November 5, 2001, p. 6.

Hoosiers Prefer Potholes to Taxes

James C. Smith

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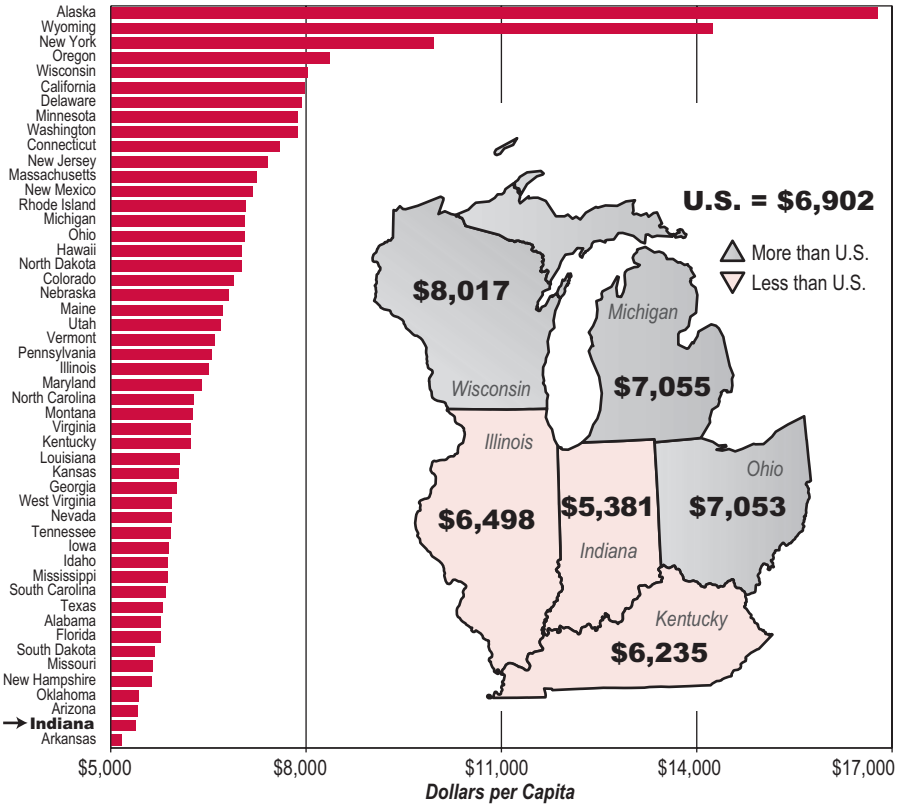
One of the fundamental operating principles in the market economy is that in the long run, you get what you pay for. Better products command higher prices. Lower prices buy goods of lesser quality.

The same principle applies to things bought with state and local tax dollars. And here is where Indiana comes in next to last. Of all fifty states, Indiana had the second lowest level of state and local taxes on a per capita basis.

In the year 2000, the latest available data from the U.S. Census Bureau, Indiana's state and local tax revenues amounted to $5,381 per person in the state population. That placed Indiana forty-ninth out of the fifty states (see **Figure 1**).

Arkansas slipped below Indiana, coming in last with a figure of $5,175. The highest revenue per capita was $16,787 in Alaska, thanks to the oil well revenue. Next came Wyoming at $14,231, New York at $9,955, and in fourth place Oregon at $8,373. All of Indiana's northern Midwest neighbors—Illinois, Minnesota, Michigan, Ohio, and Wisconsin—scored in the top twenty-five.

Figure 1
State and Local Tax Revenue Per Capita, 2000



Now before celebrating the "low tax burden" in Indiana, take a drive on an Indiana highway (be sure to steer around the potholes), or review the rankings of test scores in Hoosier high schools.

It boils down to market economics. State and local tax collections are not dollars that just disappear. They get spent on the citizens of Indiana. Almost 40 percent of state and local tax expenditures in Indiana go toward education. Another 10 percent of the total is spent on roads. The main things government spends the rest of its tax dollars on are hospitals and health care, police and fire protection, and other social services. A few dollars for sewers, parks, and prisons are in there too.

So take the full economic effect into account when looking at Hoosier taxes. Indiana is a low-tax state. And that means it is a low services state.

Education and Other Services

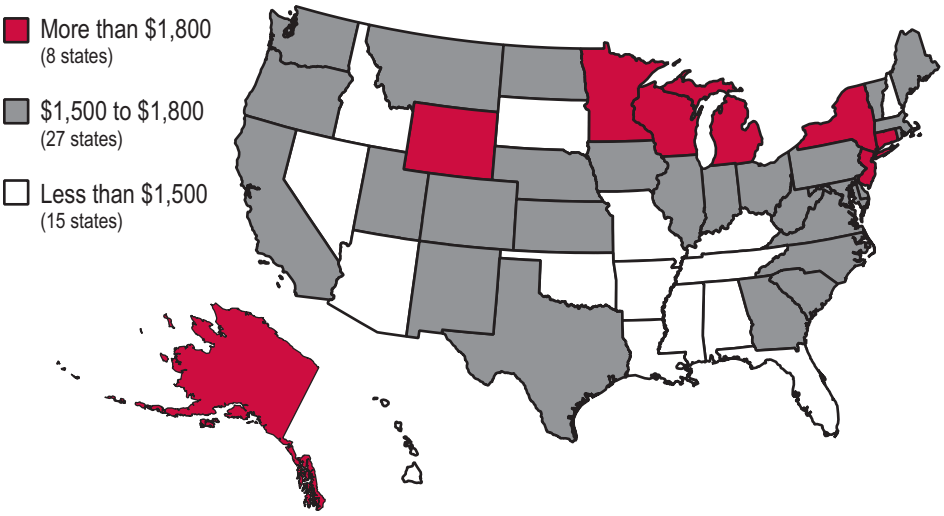
Indiana's total expenditures per capita for elementary and secondary education fall only slightly below the midpoint for all fifty states. Much of Indiana's education funding, however, comes from fees and charges generated within the educational system. In particular, Indiana University and Purdue University attract thousands of students from out of state, and the fees paid by those students help support the state's education system in general.

Apart from the fees that get collected and then plowed back into the education system, how has Indiana chosen to support education?

One measure of that support is tax expenditures for education per capita, after deducting the fees and charges. That net amount represents the tax money Indiana citizens have chosen to allocate to education, over and above the revenue from fees. By this measure, Indiana ranked thirty-third in the nation (see **Figure 2**). All its Great Lakes neighbor states beat Indiana with higher net per capita expenditures for education. Louisiana, Mississippi, and Arkansas spent less than Indiana, as did Kentucky (though Kentucky's basketball programs do pretty well).

In spending on state and local police protection, Indiana ranked forty-second out of fifty states. In spending on solid waste management, it was forty-fourth. And if you

Figure 2
State and Local Tax Expenditures for Education Per Capita (After Deducting Fees and Charges)



have bounced through a lot of potholes recently, here is the main reason: Indiana placed forty-second in per capita expenditures for highways in the year 2000.

Roughly half of the taxes in Indiana go toward buying education and roads. Almost every other state in the nation spends more per capita than we do. And in a capitalist economy, you get what you pay for.

Hoosier Standard of Living

Indiana's position almost at the bottom of all states in tax support for state and local services appears to be having an effect on the Hoosier standard of living.

The search for correlations with economic indicators is hobbled, however, by one problem: for some states, other economic factors far outweigh the effects of state and local tax spending. Correlations are obscured by these outliers. So to clarify the trends in standard of living, it makes sense to leave out the most obvious outliers.

In the case of the economic indicators shown below, the outliers number seven. Arizona and Florida were excluded because of the extraordinary population growth in each case and the comparatively high average age. Alaska was dropped because of the distortions from huge state oil income per capita. Wyoming and New Hampshire were unusual because of the large recent increases in state and local taxes there. Nevada was ruled out on account of gambling revenue, and Hawaii because it is too small, too far away, and has been in a recession for years.

That leaves forty-three states. Among these states, one finds reasonably good correlation coefficients (near 0.4) between state and local taxes per capita and important indicators of state economic health.

A more telling measure, however, is to compare the top five with the bottom five. In the sample of forty-three, the five states with the highest tax collections and expenditures per capita in 2000 were New York, Oregon, Wisconsin, California, and Delaware (Minnesota was sixth). The five states with the lowest tax collections and expenditures per capita were Arkansas (the lowest), Indiana, Oklahoma, Missouri, and South Dakota.

Over the five-year period from 1995 to 2000, the real Gross State Product (GSP) rose an average of 29 percent in the five states with the highest per capita taxes. For the five states with the lowest tax rate, GSP rose only 19 percent (see **Figure 3**).

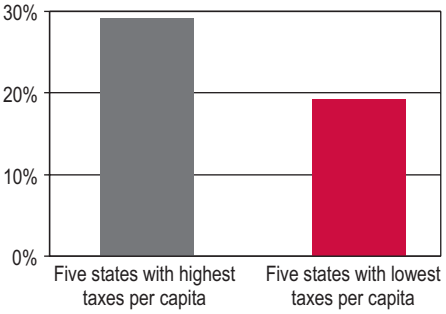
Per capita personal income (PCPI) is another good indicator of a state's standard of living. For a comparison of states, it is useful to compare PCPI as a percent of the national average, as published by the U.S. Bureau of Economic Analysis.

In 2000, the five states with the highest per capita taxes averaged 4.2 percentage points above the national average PCPI. The five low-tax states averaged 14.8 points below the rest of the country (see **Figure 4**).

Job loss has been the subject of much attention in Indiana. Once again, the top five states in taxation fared better. Over the five-year period from 1997 through 2002, the five states with high per capita taxes averaged an increase in jobs of 5.8 percent. Indiana and the other four low-tax states showed an average increase of only 3.9 percent.

Correlations do not imply causation, of course. These trends do not provide any evidence that higher state and local taxes cause a higher standard of living. But it is still interesting that the economic patterns are so consistent. Maybe the market economy also guides a state's standard of living. And once again, you get what you pay for. ◄

Figure 3
Growth in Gross State Product, 1995–2000



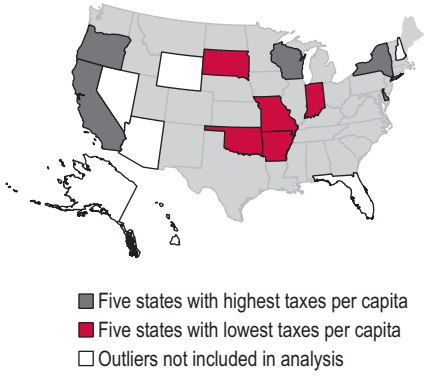
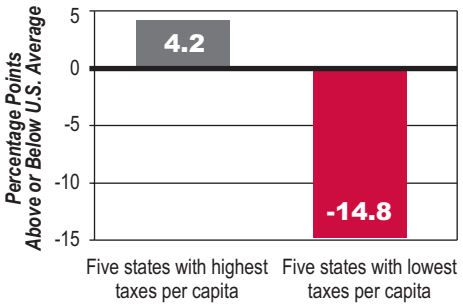


Figure 4
Per Capita Personal Income, 2000



New Census Data Show Continued Suburban Growth

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The U.S. Census Bureau recently released population estimates for Indiana's 92 counties, revealing that the strong suburban growth trend of the 1990s is continuing. Below are some highlights from the data. More information can be found on the web at www.stats.indiana.edu/pop_totals_topic_page.html.

- The five fastest growing Hoosier counties are on the suburban fringes of Indianapolis, with each increasing over 4 percent since Census 2000 (see **Figure 1**).
- Between April 1, 2000 and July 1, 2002, Hamilton County's population is estimated to have grown by almost 23,000. Trailing right behind on the numeric growth chart are two other suburban Indianapolis counties: Hendricks, with an estimated gain of 10,200 people, and Johnson, where population increased by 6,400. Allen County rounds out the list of counties with increases of 5,000 or more (see **Figure 2**).
- In 22 counties, population has grown since the census, but only because natural increase (births minus deaths) has offset losses through migration. This group includes some of the state's largest counties: Marion, Lake, St. Joseph, and Elkhart. Over the two years between April 2000 and July 2002, Marion County is estimated to have had 12,400 more people leaving the county than moving in.
- The five smallest Indiana counties—Ohio, Union, Warren, Switzerland and Benton—remain under 10,000 in population. All except Benton County, however, have grown since 2000. Ohio, Switzerland, and Warren counties even rank in the top 10 among Indiana's 92 counties on percent population change since 2000, each exceeding 3 percent.
- Martin County's population has been remarkably stable for some time. The county's 2000 census count was unchanged from 1990, at 10,369. The new estimate for mid-year 2002 shows a change of one person, boosting the Martin County population to 10,370.

Figure 1
Percent Change in Population, April 2000–July 2002

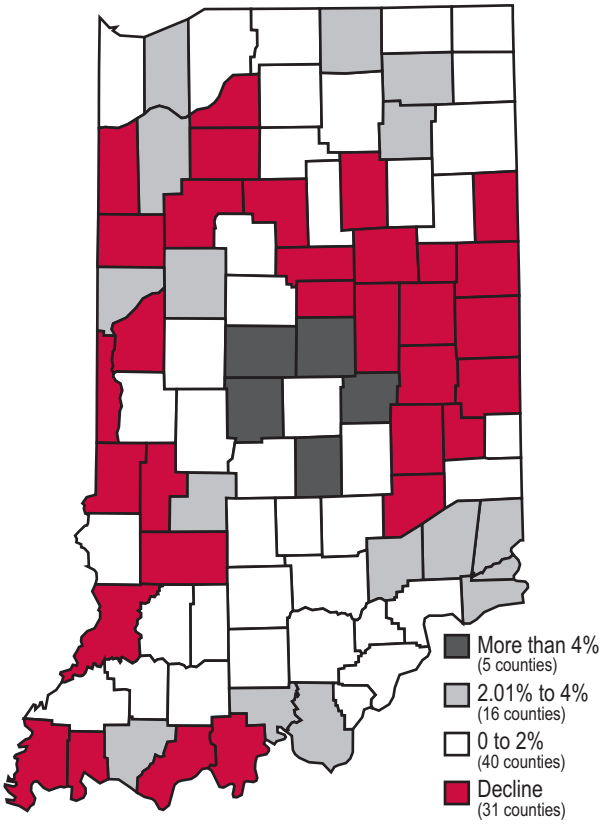
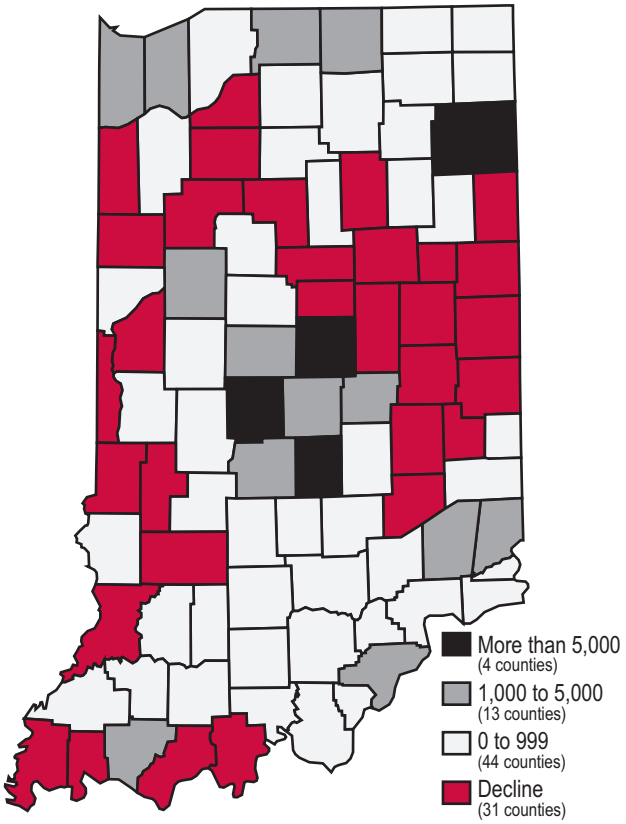


Figure 2
Numeric Change in Population, April 2000–July 2002



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