CASE 16

Nucor Corporation in 2014: Combating Low-Cost Foreign Imports and Depressed Market Demand for Steel Products

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In 2014, Nucor Corporation, with a production capacity approaching 27 million tons, was the largest manufacturer of steel and steel products in North America and ranked as the 14th-largest steel company in the world based on tons shipped in 2013. It was regarded as a low-cost producer, and it had a sterling reputation for being a global leader in introducing innovative steelmaking technologies throughout its operations. Nucor began its journey from obscurity to a steel industry leader in the 1960s. Operating under the name of Nuclear Corporation of America in the 1950s and early 1960s, the company was a maker of nuclear instruments and electronics products. After suffering through several money-losing years and facing bankruptcy in 1964, Nuclear Corporation of America's board of directors opted for new leadership and appointed F. Kenneth Iverson as president and CEO. Shortly thereafter, Iverson concluded that the best way to put the company on sound footing was to exit the nuclear instrument and electronics business and rebuild the company around its profitable South Carolina–based Vulcraft subsidiary that was in the steel joist business—Iverson had been the head of Vulcraft prior to being named president. Iverson moved the company's headquarters from Phoenix, Arizona, to Charlotte, North Carolina, in 1966, and he proceeded to expand the joist business with new operations in Texas and Alabama. Then, in 1968, top management decided to integrate backward into steelmaking, partly because of the benefits of supplying the company's own steel requirements for producing steel joists and partly because Iverson saw opportunities to capitalize on newly emerging technologies to produce steel more cheaply. In 1972 the company adopted the name Nucor Corporation, and Iverson initiated a long-term strategy to grow Nucor into a major player in the U.S. steel industry.

By 1985 Nucor had become the seventh-largest steel company in North America, with revenues of $758 million, six joist plants, and four state-of-the-art steel mills that used electric arc furnaces to produce new steel products from recycled scrap steel. Nucor was regarded as an excellently managed company, an accomplished low-cost producer, and one of the most competitively successful manufacturing companies in the country.[1] A series of articles in *The New Yorker* related how Nucor, a relatively small American steel company, had built an enterprise that led the whole world into a new era of making steel with recycled scrap steel. NBC did a business documentary that used Nucor to make the point that American manufacturers could be successful in competing against low-cost foreign manufacturers.

During the 1985–2000 period, Nucor continued to construct additional steelmaking capacity, adopt trailblazing production methods, and expand its lineup of steel products. By 2000, Nucor was the second-largest steel producer in the United States and was charging to overtake long-time leader United States Steel. Nucor continued its long-term growth strategy between 2006 and 2013,

constructing additional plants and acquiring other (mostly troubled) steel facilities at bargain-basement prices, enabling it to enter new product segments and offer customers a diverse variety of steel shapes and steel products. Heading into 2014, Nucor was solidly entrenched as the largest steel producer in North America (based on production capacity); it had 23 plants with the capacity to produce 27 million tons of assorted steel shapes (steel bars, sheet steel, steel plate, and structural steel) and had additional steel-manufacturing facilities with the capacity to make 4.6 million tons of steel joists, steel decking, cold-finish bars, steel buildings, steel mesh, steel grating, steel fasteners, and fabricated-steel reinforcing products. The company had 2013 revenues of $19.1 billion and net profits of $488.0 million, well below its prerecession peak in 2008 of $23.7 billion in revenues and $1.8 billion in net profits.

With the exception of three quarters in 2009 and one quarter in 2010 (when the steel industry in the United States was in the midst of a deep economic downturn and the demand for steel was unusually weak), Nucor had earned a profit in every quarter of every year since 1966—a truly remarkable accomplishment in a mature and cyclical business in which it was common for industry members to post losses when demand for steel sagged. As of April 2014, Nucor had paid a dividend for 164 consecutive quarters and had raised the base dividend it paid to stockholders every year since 1973, when the company first began paying cash dividends. (In years when earnings and cash flows permitted, it was Nucor's practice to pay a supplemental year-end dividend in addition to the base quarterly dividend.) Exhibit 1 provides highlights of Nucor's growth since 1970.

NUCOR IN 2014

Former CEO Ken Iverson, the architect of Nucor's climb to prominence in the steel industry, was regarded by many as a "model company president." Under Iverson, who served as Nucor's CEO from

EXHIBIT 1 Nucor's Growing Presence in the Market for Steel, 1970–2013

Year	Total Tons Sold to Outside Customers	Average Price per Ton	Net Sales (millions)	Earnings before Taxes (millions)	Pretax Earnings per Ton	Net Earnings (millions)
1970	207,000	$245	$ 50.8	$ 2.2	$ 10	$ 1.1
1975	387,000	314	121.5	11.7	30	7.6
1980	1,159,000	416	482.4	76.1	66	45.1
1985	1,902,000	399	758.5	106.2	56	58.5
1990	3,648,000	406	1,481.6	111.2	35	75.1
1995	7,943,000	436	3,462.0	432.3	62	274.5
2000	11,189,000	425	4,756.5	478.3	48	310.9
2001	12,237,000	354	4,333.7	179.4	16	113.0
2002	13,442,000	357	4,801.7	227.0	19	162.1
2003	17,473,000	359	6,265.8	70.0	4	62.8
2004	19,109,000	595	11,376.8	1,725.9	96	1,121.5
2005	20,465,000	621	12,701.0	2,027.1	104	1,310.3
2006	22,118,000	667	14,751.3	2,692.4	129	1,757.7
2007	22,940,000	723	16,593.0	2,253.3	104	1,471.9
2008	25,187,000	940	23,663.3	2,790.5	116	1,831.0
2009	17,576,000	637	11,190.3	(470.4)	(28)	(293.6)
2010	22,019,000	720	15,844.6	194.9	9	134.1
2011	23,044,000	869	20,023.6	1,169.9	53	778.2
2012	23,092,000	841	19,429.3	764.4	34	504.6
2013	23,730,000	803	19,052.0	693.6	30	488.0

Source: Company records, www.nucor.com (accessed April 15, 2014).

the time the company was formed until late 1998, Nucor was known for its aggressive pursuit of innovation and technical excellence, rigorous quality systems, strong emphasis on employee relations and workforce productivity, cost-conscious corporate culture, and ability to achieve low costs per ton produced. The company had a very streamlined organizational structure, incentive-based compensation systems, and steel mills that were among the most modern and efficient in the United States. Iverson proved himself as a master in crafting and executing a low-cost provider strategy, and he made a point of making sure that he practiced what he preached when it came to holding down costs. The offices of executives and division general managers were simply furnished. There were no company planes and no company cars, and executives were not provided with company-paid country club memberships, reserved parking spaces, executive dining facilities, or other perks. To save money on his own business expenses and set an example for other Nucor managers, Iverson flew coach class and took the subway when he was in New York City.

When Iverson left the company in 1998 following disagreements with the board of directors, he was succeeded briefly by John Correnti and then Dave Aycock, both of whom had worked in various roles under Iverson for a number of years. In 2000, Daniel R. DiMicco, who had joined Nucor in 1982 and risen up through the ranks to executive vice president, was named president and CEO. DiMicco was Nucor's chairman and CEO through 2012. Like his predecessors, DiMicco continued to pursue a strategy to aggressively grow the company's production capacity and product offerings. DiMicco expanded the company's production capabilities via both acquisition and new plant construction; tons sold rose from 11.2 million in 2000 to 25.2 million in 2008. Then the unexpected financial crisis in the fourth quarter of 2008 and the subsequent economic fallout caused tons sold in 2009 to plunge to 17.6 million and revenues to nose-dive from $23.7 billion in 2008 to $11.2 billion in 2009. Nucor's business remained in the doldrums in 2010–2013 (see Exhibit 2) because of a lackluster economy in the United States and almost everywhere else, depressed global demand for steel and steel products, global overcapacity in the steel industry, and fierce competition from foreign imports.

In the 12 years of Dan DiMicco's leadership, Nucor was quite opportunistic in initiating actions to strengthen its competitive position during periods when the demand for steel was weak and then to capitalize on these added strengths in periods of strong market demand for steel products and significantly boost financial performance. According to Dan DiMicco:[2]

EXHIBIT 2 Five-Year Financial and Operating Summary, Nucor Corporation, 2009–2013 (dollar amounts in millions, except per share data and sales per employee)

	2013	2012	2011	2010	2009
For the year					
Net sales	$19,052.0	$19,429.3	$20,023.6	$15,844.6	$11,190.3
Costs, expenses and other:					
Cost of products sold	17,641.4	17,915.7	18,142.1	15,060.9	11,090.2
Marketing, administrative and other expenses	481.9	454.9	439.5	331.5	296.9
Equity in (earnings) losses of minority-owned enterprises	(9.3)	13.3	10.0	32.1	82.3
Impairment of noncurrent assets	—	30.0	13.9	—	—
Interest expense, net	146.9	162.4	166.1	153.1	134.8
Total	18,260.9	18,576.3	18,771.8	15,577.5	11,604.3
Earnings (loss) before income taxes and noncontrolling interests	791.1	852.9	1,251.8	267.1	(414.0)
Provision for (benefit from) income taxes	205.6	259.8	390.8	60.8	(176.8)

(*Continued*)

EXHIBIT 2 (*Continued*)

	2013	2012	2011	2010	2009
Net earnings (loss)	585.5	593.1	861.0	206.3	(237.2)
Less earnings attributable to the minority-interest partners of Nucor's joint ventures*	97.5	88.5	82.8	72.2	56.4
Net earnings (loss) attributable to Nucor stockholders	$ 488.0	$ 504.6	$ 778.2	$ 134.1	$ (293.6)
Net earnings (loss) per share:					
Basic	$1.52	$1.58	$2.45	$0.42	$(0.94)
Diluted	1.52	1.58	2.45	0.42	(0.94)
Dividends declared per share	$1.4725	$1.4625	$1.4525	$1.4425	$1.41
Percentage of net earnings to net sales	2.6%	2.6%	3.9%	0.8%	−2.6%
Return on average stockholders' equity	6.4%	6.7%	10.7%	1.8%	−3.8%
Capital expenditures	$1,230.4	$1,019.3	$450.6	$345.3	$390.5
Acquisitions (net of cash acquired)	—	760.8	4.0	64.8	32.7
Depreciation	535.9	534.0	522.6	512.1	494.0
Sales per employee (000s)	859	906	974	777	539
At year-end					
Cash, cash equivalents, and short-term investments	$ 1,511.5	$ 1,157.1	$ 2,563.3	$2,479.0	$ 2,242.0
Current assets	6,410.0	5,661.4	6,708.1	5,861.2	5,182.2
Current liabilities	1,960.2	2,029.6	2,396.1	1,504.4	1,227.1
Working capital	4,449.8	3,631.8	4,312.0	4,356.8	3,995.1
Cash provided by operating activities	1,077.9	1,200.4	1,032.6	873.4	1,173.2
Current ratio	3.3	2.8	2.8	3.9	4.2
Property, plant, and equipment	$ 4,917.0	$ 4,283.1	$ 3,755.6	$ 3,852.1	$ 4,013.8
Total assets	15,203.3	14,152.1	14,570.4	13,921.9	12,571.9
Long-term debt (including current maturities)	4,380.2	3,630.2	4,280.2	4,280.2	3,086.2
Percentage of long-term debt to total capital†	35.6%	31.5%	35.7%	36.9%	28.9%
Stockholders' equity	$7,645.8	$7,641.6	$7,474.9	$7,120.1	$7,390.5
Shares outstanding (000s)	318,328	317,663	316,749	315,791	314,856
Employees	22,300	22,200	20,800	20,500	20,400

*The principal joint venture responsible for these earnings is the Nucor-Yamato Steel Company, of which Nucor owns 51 percent. This joint venture operates a structural steel mill in Blytheville, Arkansas, and it is the largest producer of structural steel beams in the Western Hemisphere.

†Total capital is defined as stockholders' equity plus long-term debt.

Source: Nucor's 2013 annual report, p. 43.

Our objective is to deliver improved returns at every point in the economic cycle. We call it delivering higher highs and higher lows. In the last major economic slump, from 2001 through 2003, Nucor had total net earnings of $339.8 million. During the even deeper slump of 2009 through 2011, Nucor earned $618.7 million, an increase of 82 percent. The most recent peak to peak earnings grew from $310.9 million in 2000 to $1.83 billion in 2008, an increase of 489 percent.

Nucor uses each economic downturn as an opportunity to grow stronger. We use the good times to prepare for the bad, and we use the bad times to prepare for the good. Emerging from downturns stronger than we enter them is how we build long-term value for our stockholders. We get stronger because our team is focused on continual improvement and because our financial strength allows us to invest in attractive growth opportunities throughout the economic cycle.

During DiMicco's tenure, Nucor completed more than 50 acquisitions from 2000 to 2012, expanding from 18 facilities to more than 200 and boosting revenues from $4.8 billion in 2000 to $19.4 billion at the end of 2012. DiMicco retired as

Nucor's CEO at the end of 2012 and was succeeded by John J. Ferriola, who had served as Nucor's president and COO since 2011. DiMicco continued on as chairman of Nucor's board of directors during 2013 and then relinquished that role to John Ferriola at the beginning of 2014.

In his first year as Nucor's CEO, Ferriola continued to pursue Nucor's core strategy of investing in down markets to better position the company for success when the economy strengthened and market demand for steel products became more robust. In the company's 2013 annual report, Ferriola said:

> We are finding ways to grow our company and be successful despite the lackluster economy by continually looking for ways to improve our performance and lower our costs, investing in projects that will move us up the value chain and providing superior customer service.

NUCOR'S EVER-GROWING PRODUCT LINE, 1967–2014

Over the years, Nucor had expanded progressively into the manufacture of a wider and wider range of steel shapes and steel products, enabling it in 2014 to offer steel users the broadest product lineup of any North American steel producer. Steel shapes and steel products were considered commodities. While some steelmakers had plants whose production quality was sometimes inconsistent or, on occasion, failed to meet customer-specified metallurgical characteristics, most steel plants turned out products of comparable metallurgical quality—one producer's reinforcing bar was essentially the same as another producer's reinforcing bar, and a particular type and grade of sheet steel made at one plant was essentially identical to the same type and grade of sheet steel made at another plant. The commodity nature of steel products forced steel producers to be very price-competitive, with the market price of each particular steel product being driven by demand–supply conditions for that product.

Finished Steel Products

Nucor's first venture into steel in the late 1960s, via its Vulcraft division, was principally one of fabricating steel joists and joist girders from steel that was purchased from various steelmakers. Vulcraft expanded into the fabrication of steel decking in 1977. The division expanded its operations over the years, and, as of 2014, Nucor's Vulcraft division was the largest producer and leading innovator of open-web steel joists, joist girders, and steel deck in the United States. It had seven plants with annual capacity of 715,000 tons that made steel joists and joist girders and nine plants with 530,000 tons of capacity that made steel deck; in 2012–2013, about 85 percent of the steel needed to make these products was supplied by various Nucor steelmaking plants. Vulcraft's joist, girder, and decking products were used mainly for roof and floor support systems in retail stores, shopping centers, warehouses, manufacturing facilities, schools, churches, hospitals, and, to a lesser extent, multistory buildings and apartments. Customers for these products were principally nonresidential construction contractors.

In 1979, Nucor began fabricating cold-finished steel products. These consisted mainly of cold drawn and turned, ground, and polished steel bars or rods of various shapes—rounds, hexagons, flats, channels, and squares—made from carbon, alloy, and leaded steels based on customer specifications or end-use requirements. Cold-finished steel products were used in tens of thousands of other products, including anchor bolts, hydraulic cylinders, farm machinery, air conditioner compressors, electric motors, motor vehicles, appliances, and lawn mowers. Nucor sold cold-finish steel directly to large-quantity users in the automotive, farm machinery, hydraulic, appliance, and electric motor industries and to steel service centers that in turn supplied manufacturers needing only relatively small quantities. In 2013, Nucor Cold Finish was the largest producer of cold-finished bar products in North America and had facilities in Missouri, Nebraska, South Carolina, Utah, Wisconsin, and Ontario, Canada, with a capacity of about 860,000 tons per year. It obtained most of its steel from Nucor's mills that made steel bar. This factor, along with the fact that all of Nucor's cold-finished facilities employed the latest technology and were among the most modern in the world, resulted in Nucor Cold Finish having a highly competitive cost structure. It maintained sufficient inventories of cold-finish products to fulfill anticipated orders.

Nucor produced metal buildings and components throughout the United States under several brands: Nucor Building Systems, American Buildings Company, Kirby Building Systems, Gulf States Manufacturers, and CBC Steel Buildings. In 2014,

the Nucor Buildings Group had 11 metal buildings plants, with an annual capacity of approximately 465,000 tons. Sales were 280,000 tons in 2013, an increase of 2 percent over 274,000 tons in 2010. Nucor's Buildings Group began operations in 1987 and currently had the capability to supply customers with buildings ranging from less than 1,000 square feet to more than 1,000,000 square feet. Complete metal buildings packages could be customized and combined with other materials such as glass, wood, and masonry to produce a cost-effective, aesthetically pleasing building built to a customer's particular requirements. The buildings were sold primarily through an independent builder distribution network. The primary markets served were commercial, industrial, and institutional buildings, including distribution centers, automobile dealerships, retail centers, schools, warehouses, and manufacturing facilities. Nucor's Buildings Group obtained a significant portion of its steel requirements from the Nucor bar and sheet mills.

Another Nucor division produced steel mesh, grates, and fasteners. Various steel mesh products were made at two facilities in the United States and one in Canada that had a combined annual production capacity of about 128,000 tons. Steel and aluminum bar grating, safety grating, and expanded metal products were produced at several North American locations that had a combined annual production capacity of 103,000 tons. Nucor Fastener, located in Indiana, began operations in 1986 with the construction of a $25 million plant. At the time, imported steel fasteners accounted for 90 percent of the U.S. market because U.S. manufacturers were not competitive on cost and price. Iverson said, "We're going to bring that business back; we can make bolts as cheaply as foreign producers." Nucor built a second fastener plant in 1995, giving it the capacity to supply about 20 percent of the U.S. market for steel fasteners. In 2013, these two facilities had annual capacity of over 75,000 tons and produced carbon and alloy steel hex-head cap screws, hex bolts, structural bolts, nuts and washers, finished hex nuts, and custom-engineered fasteners that were used for automotive, machine tool, farm implement, construction, military, and various other applications. Nucor Fastener obtained much of the steel it needed from Nucor's mills that made steel bar.

Beginning in 2007, Nucor—through its newly acquired Harris Steel subsidiary—began fabricating, installing, and distributing steel reinforcing bars (rebars) for highways, bridges, schools, hospitals, airports, stadiums, office buildings, high-rise residential complexes, and other structures where steel reinforcing was essential to concrete construction. Harris Steel had over 70 fabrication facilities in the United States and Canada, with each facility serving the surrounding local market. Since acquiring Harris Steel, Nucor had more than doubled its rebar fabrication capacity to over 1,700,000 tons annually. Total fabricated rebar sales in 2013 were 1,065,000 tons, down 10 percent from 1,180,000 tons in 2012. Much of the steel used in making fabricated rebar products was obtained from Nucor steel plants that made steel bar. Fabricated reinforcing products were sold only on a contract bid basis.

Steelmaking

In 1968 Nucor got into basic steelmaking, building a mill in Darlington, South Carolina, to manufacture steel bars. The Darlington mill was one of the first plants of major size in the United States to use electric arc furnace technology to melt scrap steel and cast molten metal into various shapes. Electric arc furnace technology was particularly appealing because the labor and capital requirements for melting steel scrap and producing crude steel were far lower than those at conventional integrated steel mills, where raw steel was produced using coke ovens, basic oxygen blast furnaces, ingot casters, and multiple types of finishing facilities to make crude steel from iron ore, coke, limestone, oxygen, scrap steel, and other ingredients. By 1981, Nucor had four steel mills making carbon and alloy steels in bars, angles, and light structural shapes; since then, Nucor had undertaken extensive capital projects to keep these facilities modernized and globally competitive.

In 2000–2011, Nucor aggressively expanded its market presence in steel bars, and by 2012 it had 13 bar mills located across the United States that produced concrete-reinforcing bars, hot-rolled bars, rods, light shapes, structural angles, channels, and guard rails in carbon and alloy steels; in 2014, these 13 plants had total annual capacity of approximately 9.1 million tons. Four of the 13 mills made hot-rolled special quality bar manufactured to exacting specifications. The products of the 13 bar mills had wide usage and were sold primarily to customers in the agricultural, automotive, construction, energy,

furniture, machinery, metal buildings, railroad, recreational equipment, shipbuilding, heavy truck, and trailer industries.

Nucor began work in 2012 on a $290 million project to expand its wire rod and special-quality steel bar production capabilities at three existing bar mills by 1 million tons annually; the purpose of the investment was to enable Nucor to produce engineered bars for the most demanding applications (and realize a significantly higher price) while maintaining its market share in commodity bar products by shifting production to its other bar mills that were operating below capacity. Completion of the added capacity to make special-quality bar products was expected sometime in 2014, with production startup following shortly thereafter. In addition, the company had recently renovated an existing wire rod and bar mill in Kingman, Arizona, to boost production capacity from 200,000 tons annually to 500,000 tons annually, thereby putting Nucor in a strong position to serve wire rod and rebar customers in the southwestern U.S. market. Nucor executives expected that the added capacity at the three special-quality bar mills and at the Kingman plant would be an important source of revenue and profit growth in upcoming years.

In the late 1980s, Nucor entered into the production of sheet steel at a newly constructed plant in Crawfordsville, Indiana. Flat-rolled sheet steel was used in the production of motor vehicles, appliances, steel pipes and tubes, and other durable goods. The Crawfordsville plant was the first in the world to employ a revolutionary thin-slab casting process that substantially reduced the capital investment and costs to produce flat-rolled sheet steel. Thin-slab casting machines had a funnel-shaped mold to squeeze molten steel down to a thickness of 1.5 to 2.0 inches, compared to the typically 8- to 10-inch-thick slabs produced by conventional casters. It was much cheaper to then build and operate facilities to roll thin-gauge sheet steel from 1.5- to 2-inch-thick slabs than from 8- to 10-inch-thick slabs. When the Crawfordsville plant first opened in 1989, it was said to have cost $50 to $75 per ton below the costs of traditional sheet steel plants, a highly significant cost advantage in a commodity market where the going price at the time was $400 per ton. *Forbes* magazine described Nucor's pioneering use of thin-slab casting as the most substantial, technological industrial innovation in the past 50 years.[3] By 1996 two additional sheet steel mills that employed thin-slab casting technology were constructed and a fourth mill was acquired in 2002, giving Nucor the capacity to produce 11.3 million tons of sheet steel products annually. Nucor also operated two Castrip sheet production facilities, one built in 2002 at the Crawfordsville plant and a second built in Arkansas in 2009; these facilities used the breakthrough strip-casting technology that involved the direct casting of molten steel into the final shape and thickness without further hot or cold rolling. The process allowed for lower capital investment, reduced energy consumption, smaller-scale plants, and improved environmental impact (because of significantly lower emissions).

Also in the late 1980s, Nucor added wide-flange steel beams, pilings, and heavy structural steel products to its lineup of product offerings. Structural steel products were used in buildings, bridges, overpasses, and similar projects where strong weight-bearing support was needed. Customers included construction companies, steel fabricators, manufacturers, and steel service centers. To gain entry to the structural steel segment, in 1988 Nucor entered into a joint venture with Yamato-Kogyo, one of Japan's major producers of wide-flange beams, to build a new structural steel mill in Arkansas; a second mill was built on the same site in the 1990s that made the Nucor-Yamato venture in Arkansas the largest structural beam facility in the Western Hemisphere. In 1999, Nucor started operations at a third structural steel mill in South Carolina. The mills in Arkansas and South Carolina both used a special continuous-casting method that was quite cost-effective. In 2014, the Nucor-Yamato mill completed a $115 million project to add several new sheet-piling sections, increase production of single-sheet widths by 22 percent, and provide customers with a lighter, stronger sheet covering more area at a lower installed cost. Going into 2014, Nucor had the capacity to make 3.7 million tons of structural steel products annually.

Starting in 2000, Nucor began producing steel plate of various thicknesses and lengths that was sold to manufacturers of heavy equipment, ships, barges, bridges, railcars, refinery tanks, pressure vessels, pipes and tubes, wind towers, and similar products. Steel plate was made at two mills in Alabama and North Carolina having combined capacity of about 2.9 million tons. In early 2011, Nucor started operations at a newly constructed 125,000-ton heat-treating facility at the plate mill

in North Carolina. Heat-treated steel plate was used in applications requiring higher strength, abrasion resistance, and toughness. During 2012, the North Carolina plate mill began using a newly constructed vacuum-tank degasser and started operations on a new 120,000-ton normalizing line in 2013. Collectively, these investments allowed Nucor to broaden its product offerings in the markets for pressure vessels, tank cars, tubular structures for offshore oil rigs, and naval and commercial shipbuilding.

All of Nucor's 23 steel mills used electric arc furnaces, whereby scrap steel and other metals were melted and the molten metal was then poured into continuous-casting systems. Sophisticated rolling mills converted the billets, blooms, and slabs produced by various casting equipment into rebars, angles, rounds, channels, flats, sheets, beams, plates, and other finished steel products. Nucor's steel mill operations were highly automated, typically requiring fewer operating employees per ton produced than the mills of rival companies. High worker productivity at all Nucor steel mills resulted in labor costs roughly 50 percent lower than the labor costs at the integrated mills of companies using union labor and conventional blast furnace technology. Nucor's value chain (anchored in using electric arc furnace technology to recycle scrap steel) involved far fewer production steps, far less capital investment, and considerably less labor than the value chains of companies with integrated steel mills that made crude steel from iron ore.

The breadth of Nucor's product line in steel mill products and finished steel products made it the most diversified steel producer in North America, and all of its steel mills were among the most modern and efficient mills in the United States. In 2013, the company was the North American market leader in nine product categories—steel bars, structural steel, steel reinforcing bars, steel joists, steel deck, cold-finished bar steel, metal buildings, steel piling distribution, and rebar fabrication, distribution, and installation.[4] It ranked number two in 2013 sales of plate steel, and number three in sales of sheet steel. Exhibit 3 shows Nucor's sales by product category for 1990 to 2013.

However, despite Nucor's long-standing reputation for being a cost-efficient producer, it had been stymied throughout the 2010–2013 period in its quest to operate its 23 steel mills as cost-efficiently as they were capable of being operated. Ever since the Great Recession of 2008–2009, the combination of an anemic economic recovery, depressed market demand for steel products, industrywide overcapacity, and fierce competition from foreign imports in certain product categories had forced Nucor to operate its steel mills well below full capacity. Whereas in the first three quarters of 2008, Nucor's steel mills operated at an average of 91 percent of full capacity, the average capacity utilization rates at Nucor's 23 steel mills were 54 percent in 2009, 70 percent in 2010, 74 percent in 2011, 75 percent in 2012, and just over 76 percent in 2013 (including tons shipped to outside customers and tons shipped to Nucor facilities making finished steel products). Likewise, subpar average capacity utilization rates at Nucor's facilities for producing finished steel products—54 percent in 2010, 57 percent in 2011, 58 percent in 2012, and 61 percent in 2013—had impaired Nucor's ability to keep overall production costs for finished steel products as low as it would have been able to keep them at higher production levels. Market conditions in the steel industry still remained challenging in 2014, making the 2009–2014 period one of the longest and deepest economic slumps in several decades.

One of Nucor's biggest challenges in boosting its sales and profitability concerned the unusually weak demand for steel products used in nonresidential construction. As the company stated in its 2013 10-K report:[5]

> Sales of many of our products are dependent upon capital spending in the nonresidential construction markets in the United States, including in the industrial and commercial sectors, as well as capital spending on infrastructure that is publicly funded such as bridges, schools, prisons and hospitals. Unlike recoveries from past recessions, the recovery from the recession of 2008–2009 has not included a strong recovery in the severely depressed nonresidential construction market. In fact, while capital spending on nonresidential construction projects is slowly improving, it continues to lack sustained momentum, which is posing a significant challenge to our business. We do not expect to see strong growth in our net sales until we see a sustained increase in capital spending on these types of construction projects.

Pricing and Sales

In both 2012 and 2013, approximately 86 percent of the steel shipped from Nucor's steel mills went to external customers. The balance of the company's

EXHIBIT 3 Nucor's Sales of Steel and Steel Products to Outside Customers, by Product Category, 1990–2013

	Tons Sold to Outside Customers (thousands)									
	Steel Mill Products					Finished Steel Products				
Year	Sheet Steel (2013 capacity of ~11.3 million tons)	Steel Bars (2013 capacity of ~9.1 million tons)	Structural Steel (2013 capacity of ~3.7 million tons)	Steel Plate (2013 capacity of ~2.9 million tons)	Total (2013 capacity of ~27 million tons)	Steel Joists (2013 capacity of ~715,000 tons)	Steel Deck (2013 capacity of ~530,000 tons)	Cold Finished Steel (2013 capacity of ~860,000 tons)	Rebar Fabrication (2013 capacity of ~1.7 million tons) and Other Products*	Total Tons
2013	7,491	5,184	2,695	2,363	17,733	342	334	474	4,847	23,730
2012	7,622	5,078	2,505	2,268	17,473	291	308	492	4,528	23,092
2011	7,500	4,680	2,338	2,278	16,796	288	312	494	5,154	23,044
2010	7,434	4,019	2,139	2,229	15,821	276	306	462	5,154	22,019
2009	5,212	3,629	1,626	1,608	12,075	264	310	330	4,596	17,576
2008	7,505	5,266	2,934	2,480	18,185	485	498	485	4,534	25,187
2007	8,266	6,287	3,154	2,528	20,235	542	478	449	1,236	22,940
2006	8,495	6,513	3,209	2,432	20,649	570	398	327	174	22,118
2005	8,026	5,983	2,866	2,145	19,020	554	380	342	169	20,465
2004	8,078	5,244	2,760	1,705	17,787	522	364	271	165	19,109
2003	6,954	5,530	2,780	999	16,263	503	353	237	117	17,473
2002	5,806	2,947	2,689	872	12,314	462	330	226	110	13,442
2001	5,074	2,687	2,749	522	11,032	532	344	203	126	12,237
2000	4,456	2,209	3,094	20	9,779	613	353	250	194	11,189
1995	2,994	1,799	1,952	—	6,745	552	234	234	178	7,943
1990	420	1,382	1,002	—	2,804	443	134	163	104	3,648

*Includes steel fasteners (steel screws, nuts, bolts, washers, and bolt assemblies), steel mesh, steel grates, metal buildings systems, light-gauge steel framing, and scrap metal.

Source: Company records, www.nucor.com (accessed April 15, 2014).

steel mill shipments went to supply the steel needs of the company's joist, deck, rebar fabrication, fastener, metal buildings, and cold-finish operations.

The commodity nature of steel products meant that the prices a company could command were governed by market demand–supply conditions that shifted more or less constantly and caused the spot market price for commodity steel to bounce around on a weekly and sometimes daily basis. The big majority of Nucor's steel sales were to customers that placed orders monthly based on their immediate upcoming needs; Nucor's pricing strategy was to charge customers the going spot price on the day an order was placed. Ongoing shifts in market demand–supply conditions and the resulting spot market price caused Nucor's average sales prices per ton to fluctuate from quarter to quarter, sometimes by considerable amounts—see Exhibit 4. It was Nucor's practice to quote the same payment terms to all customers and for customers to pay all shipping charges.

Nucor marketed the output of its steel mills and steel product facilities mainly through an in-house sales force; there were salespeople located at almost every Nucor production facility. In 2012 and 2013, approximately 65 percent of Nucor's sheet steel sales were to contract customers (versus 40 percent in 2010 and 30 percent in 2009); the contracts for sheet steel were usually for periods of 6 to 12 months and permitted price adjustments to reflect changes in the market pricing for steel and/or raw-material costs.

EXHIBIT 4 Nucor's Average Quarterly Sales Prices for Steel Products, by Product Category, 2011–2013

Period	Sheet Steel	Steel Bars	Structural Steel	Steel Plate	Average of All Steel Mill Products	Average of All Finished Steel Products*
2011						
Qtr 1	$755	$779	$831	$ 880	$789	$1,274
Qtr 2	894	803	923	1,029	891	1,361
Qtr 3	800	811	901	1,021	847	1,381
Qtr 4	744	796	891	946	806	1,395
2012						
Qtr 1	780	823	866	929	824	1,387
Qtr 2	759	795	905	922	812	1,395
Qtr 3	707	745	973	837	775	1,371
Qtr 4	690	723	956	778	751	1,420
2013						
Qtr 1	699	732	949	769	756	1,380
Qtr 2	676	731	959	765	746	1,374
Qtr 3	693	708	923	753	741	1,369
Qtr 4	724	709	969	767	763	1,378

*An average of the steel prices for steel deck, steel joists and girders, steel buildings, cold-finished steel products, steel mesh, fasteners, fabricated rebar, and other finished steel products.

Source: Company records, www.nucor.com (accessed April 15, 2014).

The other 35 percent of Nucor's sheet steel shipments and virtually all of the company's shipments of plate, structural, and bar steel were sold at the prevailing spot market price—customers not purchasing sheet steel rarely ever wanted to enter into a contract sales agreement. Nucor's steel mills maintained inventory levels deemed adequate to fill the expected incoming orders from customers.

Nucor sold steel joists, joist girders, and deck on the basis of firm, fixed-price contracts that, in most cases, were won in competitive bidding against rival suppliers. Longer-term supply contracts for these items that were sometimes negotiated with customers contained clauses permitting price adjustments to reflect changes in prevailing raw-material costs. Steel joists, girders, and deck were manufactured to customers' specifications and shipped immediately; Nucor's plants did not maintain inventories of steel joists, girders, and deck. Nucor also sold fabricated reinforcing products only on a construction contract bid basis. However, cold-finished steel, steel fasteners, steel grating, wire, and wire mesh were all manufactured in standard sizes, with each facility maintaining sufficient inventories of its products to fill anticipated orders; almost all sales of these items were made at the prevailing spot price. The average prices Nucor received for its various finished steel products are shown in the last column of Exhibit 4.

NUCOR'S STRATEGY TO GROW AND STRENGTHEN ITS BUSINESS AND COMPETITIVE CAPABILITIES

Starting in 2000, Nucor embarked on a five-part growth strategy that involved new acquisitions, new plant construction, continued plant upgrades and cost reduction efforts, international growth through joint ventures, and greater control over raw-material costs.

Strategic Acquisitions

Beginning in the late 1990s, Nucor management concluded that growth-minded companies like Nucor might well be better off purchasing existing plant capacity rather than building new capacity, provided the acquired plants could be bought at bargain prices, economically retrofitted with new equipment if need be, and then operated at costs comparable to (or even below) those of newly constructed state-of-the-art plants. At the time, the steel industry worldwide had far more production capacity than was needed to meet market demand, forcing many companies to operate in the red. Nucor had not made any acquisitions since about 1990, and a team of five people was assembled in 1998 to explore acquisition possibilities that would strengthen Nucor's customer base, geographic coverage, and lineup of product offerings.

For almost three years, no acquisitions were made. But then the economic recession that hit Asia and Europe in the late 1990s reached the United States in full force in 2000–2001. The September 11, 2001, terrorist attacks further weakened steel purchases by such major steel-consuming industries as construction, automobiles, and farm equipment. Many steel companies in the United States and other parts of the world were operating in the red. Market conditions in the United States were particularly grim. Between October 2000 and October 2001, 29 steel companies in the United States, including Bethlehem Steel Corp. and LTV Corp., the nation's third- and fourth-largest steel producers respectively, filed for bankruptcy protection. Bankrupt steel companies accounted for about 25 percent of U.S. capacity. The *Economist* noted that of the 14 steel companies tracked by Standard & Poor's, only Nucor was indisputably healthy. Some experts believed that close to half of the U.S. steel industry's production capacity might be forced to close before conditions improved; about 47,000 jobs in the U.S. steel industry had vanished since 1997.

One of the principal reasons for the distressed market conditions in the United States was a surge in imports of low-priced steel from foreign countries. Outside the United States, weak demand and a glut of capacity had driven commodity steel prices to 20-year lows in 1998. Globally, the industry had about 1 billion tons of annual capacity, but puny demand had kept production levels in the range of 750 to 800 million tons per year during 1998–2000. A number of foreign steel producers, anxious to keep their mills running and finding few good market opportunities elsewhere, began selling steel in the U.S. market at cut-rate prices in 1997–1999. Nucor and other U.S. companies reduced prices to better compete, and several filed unfair trade complaints against foreign steelmakers. The U.S. Department of Commerce concluded in March 1999 that steel companies in six countries (Canada, South Korea, Taiwan, Italy, Belgium, and South Africa) had illegally dumped stainless steel in the United States and that the governments of Belgium, Italy, and South Africa further facilitated the dumping by giving their steel producers unfair subsidies that at least partially made up for the revenue losses of selling at below-market prices. Congress and the Clinton administration opted to not impose tariffs or quotas on imported steel, which helped precipitate the number of bankruptcy filings. However, the Bush administration was more receptive to protecting the U.S. steel industry from the dumping practices of foreign steel companies. In October 2001, the U.S. International Trade Commission (ITC) ruled that increased steel imports of semi-finished steel, plate, hot-rolled sheet, strip and coils, cold-rolled sheet and strip, and corrosion-resistant and coated sheet and strip were a substantial cause of serious injury, or threat of serious injury, to the U.S. industry. In March 2002, the Bush administration imposed tariffs of up to 30 percent on imports of select steel products to help provide relief from Asian and European companies dumping steel in the United States at ultra-low prices.

Even though market conditions were tough for Nucor, management concluded that oversupplied steel industry conditions and the number of beleaguered U.S. companies made it attractive to expand Nucor's production capacity via acquisition. Starting in 2001 and continuing through 2013, the company proceeded to make a series of strategic acquisitions to strengthen Nucor's competitiveness, selectively expand its product offerings, improve its ability to serve customers in particular geographic locations, and boost the company's overall prospects for excellent profitability in times when market demand for steel was strong:

- In 2001, Nucor paid $115 million to acquire substantially all of the assets of Auburn Steel Company's 400,000-ton steel bar facility in Auburn, New York. This acquisition gave Nucor expanded market presence in the Northeast and was seen as a good source of supply for a new Vulcraft joist plant being constructed in Chemung, New York.

- In November 2001, Nucor announced the acquisition of ITEC Steel Inc. for a purchase price of $9 million. ITEC Steel had annual revenues of $10 million and produced load-bearing light-gauge steel framing for the residential and commercial markets at facilities in Texas and Georgia. Nucor was impressed with ITEC's dedication to continuous improvement and intended to grow ITEC's business via geographic and product line expansion. ITEC Steel's name was changed to Nucor Steel Commercial Corporation in 2002.
- In July 2002, Nucor paid $120 million to purchase Trico Steel Company, which had a 2.2-million-ton sheet steel mill in Decatur, Alabama. Trico Steel was a joint venture of LTV (which owned a 50 percent interest) and two leading international steel companies—Sumitomo Metal Industries and British Steel. The joint venture partners had built the mill in 1997 at a cost of $465 million, but Trico was in Chapter 11 bankruptcy proceedings at the time of the acquisition and the mill was shut down. The Trico mill's capability to make thin sheet steel with a superior surface quality added competitive strength to Nucor's strategy to gain sales and market share in the flat-rolled sheet segment. By October 2002, two months ahead of schedule, Nucor had restarted operations at the Decatur mill and was shipping products to customers.
- In December 2002, Nucor paid $615 million to purchase substantially all of the assets of Birmingham Steel Corporation, which included four bar mills in Alabama, Illinois, Washington, and Mississippi. The four plants had a capacity of approximately 2 million tons annually. The purchase price also included approximately $120 million in inventory and receivables, the assets of Port Everglade Steel Corp., the assets of Klean Steel, Birmingham Steel's ownership interest in Richmond Steel Recycling, and a mill in Memphis, Tennessee, that was not currently in operation. Top executives believed the Birmingham Steel acquisition would broaden Nucor's customer base and build profitable market share in bar steel products.
- In August 2004, Nucor acquired a cold-rolling mill in Decatur, Alabama, from Worthington Industries for $80 million. This 1-million-ton mill, which opened in 1998, was located adjacent to the previously acquired Trico mill and gave Nucor added ability to serve the needs of sheet steel buyers located in the southeastern United States.
- In June 2004, Nucor paid a cash price of $80 million to acquire a plate mill owned by Britain-based Corus Steel that was located in Tuscaloosa, Alabama. The Tuscaloosa mill, which currently had a capacity of 700,000 tons that Nucor management believed was expandable to 1 million tons, was the first U.S. mill to employ a special technology that enabled high-quality wide steel plate to be produced from coiled steel plate. The mill produced coiled steel plate and plate products that were cut to customer-specified lengths. Nucor intended to offer these niche products to its commodity-plate and coiled-plate customers.
- In February 2005, Nucor completed the purchase of Fort Howard Steel's operations in Oak Creek, Wisconsin; the Oak Creek facility produced cold-finished bars in sizes up to 6-inch rounds and had approximately 140,000 tons of annual capacity.
- In June 2005, Nucor purchased Marion Steel Company located in Marion, Ohio, for a cash price of $110 million. Marion operated a bar mill with annual capacity of about 400,000 tons; the Marion location was within close proximity to 60 percent of the steel consumption in the United States.
- In May 2006, Nucor acquired Connecticut Steel Corporation for $43 million in cash. Connecticut Steel's bar-products mill in Wallingford had annual capacity to make 300,000 tons of wire rod and rebar and approximately 85,000 tons of wire mesh fabrication and structural mesh fabrication, products that complemented Nucor's present lineup of steel bar products provided to construction customers.
- In late 2006, Nucor purchased Verco Manufacturing Co. for approximately $180 million; Verco produced steel floor and roof decking at one location in Arizona and two locations in California. The Verco acquisition further solidified Vulcraft's market-leading position in steel decking, giving it total annual capacity of over 500,000 tons.
- In January 2007, Nucor acquired Canada-based Harris Steel for about $1.07 billion. Harris Steel had 2005 sales of Cdn$1.0 billion and earnings of Cdn$64 million. The company's operations consisted of (1) Harris Rebar, which was involved in the fabrication and placement of concrete-reinforcing steel and the design and installation of concrete post-tensioning systems;

(2) Laurel Steel, which manufactured and distributed wire and wire products, welded wire mesh, and cold-finished bar; and (3) Fisher & Ludlow, which manufactured and distributed heavy industrial steel grating, aluminum grating, and expanded metal. In Canada, Harris Steel had 24 reinforcing-steel fabricating plants, two steel-grating distribution centers, and one cold-finished bar and wire processing plant; in the United States, it had 10 reinforcing-steel fabricating plants, two steel-grating manufacturing plants, and three cold-finished bar and wire processing plants. Harris had customers throughout Canada and the United States and employed about 3,000 people. For the past three years, Harris had purchased a big percentage of its steel requirements from Nucor. Nucor management opted to operate Harris Steel as an independent subsidiary.

- Over several months in 2007 following the Harris Steel acquisition, Nucor, through its new Harris Steel subsidiary, acquired rebar fabricator South Pacific Steel Corporation, Consolidated Rebar, Inc., and a 90 percent equity interest in rebar fabricator Barker Steel Company, as well as completing several smaller transactions—all aimed at growing its presence in the rebar fabrication marketplace.
- In August 2007, Nucor acquired LMP Steel & Wire Company for a cash purchase price of approximately $27.2 million, adding 100,000 tons of cold-drawn steel capacity.
- In October 2007, Nucor completed the acquisition of Nelson Steel, Inc., for a cash purchase price of approximately $53.2 million, adding 120,000 tons of steel mesh capacity.
- In the third quarter of 2007, Nucor completed the acquisition of Magnatrax Corporation, a leading provider of custom-engineered metal buildings, for a cash purchase price of approximately $275.2 million. The Magnatrax acquisition enabled Nucor's Buildings Group to become the second-largest metal buildings producer in the United States.
- In August 2008, Nucor's Harris Steel subsidiary acquired Ambassador Steel Corporation for a cash purchase price of about $185.1 million. Ambassador Steel was one of the largest independent fabricators and distributors of concrete-reinforcing steel—in 2007, Ambassador shipped 422,000 tons of fabricated rebar and distributed another 228,000 tons of reinforcing steel. Its business complemented that of Harris Steel, and the acquisition represented another in a series of moves to greatly strengthen Nucor's competitive position in the rebar fabrication marketplace.
- Another small rebar fabrication company, Free State Steel, was acquired in late 2009, adding to Nucor's footprint in rebar fabrication.
- In June 2012, Nucor acquired Skyline Steel, LLC, and its subsidiaries for a cash price of approximately $675.4 million. Skyline was primarily a distributor of steel pilings, and it also processed and fabricated spiral-weld pipe piling, rolled and welded pipe piling, cold-formed sheet piling, and threaded bar. The Skyline acquisition paired Skyline's leadership position in the steel piling distribution market with Nucor's own Nucor-Yamato plant in Arkansas, which was the market leader in steel piling manufacturing. To capitalize upon the strategic fits between Skyline's business and Nucor's business, Nucor immediately announced that its Nucor-Yamato mill in Arkansas would begin a capital project to (1) add several new sheet-piling sections, (2) increase the production of single-sheet widths by 22 percent, and (3) produce a lighter, stronger sheet covering more area at a lower installed cost—outcomes that would broaden the range of hot-rolled steel piling products that could be marketed through Skyline's distribution network in the United States, Canada, Mexico, and the Caribbean that supplied customers needing steel pilings for marine construction, bridge and highway construction, heavy civil construction, storm protection, underground commercial parking, and environmental containment projects.

Commercialization of New Technologies and New Plant Construction

The second element of Nucor's growth strategy was to continue to be a technology leader and to be opportunistic in constructing new plant capacity that would enable the company to expand its presence in attractive new or existing market segments. From its earliest days, Nucor had been an early and aggressive investor in two types of steelmaking breakthroughs:

- *Disruptive technological innovations*—production processes and equipment that would give Nucor a commanding market advantage and thus be disruptive to the efforts of competitors in matching Nucor's cost competitiveness and/or product quality.
- *Leapfrog technological innovations*—production processes and equipment that would enable Nucor to overtake competitors in terms of product quality, cost per ton, or market share.

One of Nucor's biggest and most recent successes in pioneering new technology had been at its Crawfordsville facilities, where Nucor had the world's first installation of direct strip casting of carbon sheet steel—a process called Castrip. After several years of testing and process refinement at Crawfordsville, Nucor announced in 2005 that the Castrip process was ready for commercialization; Nucor had exclusive rights to Castrip technology in the United States and Brazil. The process, which had proved to be quite difficult to bring to commercial reality, was a major technological breakthrough for producing flat-rolled, carbon, and stainless steels in very thin gauges; it involved far fewer process steps to cast metal at or very near customer-desired thicknesses and shapes. The Castrip process drastically reduced capital outlays for equipment and produced savings on operating expenses as well—major expense savings resulted from the ability to use lower-quality scrap metal and to expend 90 percent less energy to process liquid metal into hot-rolled steel sheets. A big environmental benefit of the Castrip process was that it cut greenhouse gas emissions by up to 80 percent. Nucor's Castrip facility at Crawfordsville had the capacity to produce 500,000 tons annually. In 2006, Nucor built a second Castrip facility on the site of its structural steel mill in Arkansas.

Nucor's growth strategy also included investing in the construction of new plant capacity or enhanced production capabilities whenever management spotted opportunities to strengthen its competitive position vis-à-vis rivals:

- In 2006, Nucor announced that it would construct a new $27 million facility to produce metal buildings systems in Brigham City, Utah. The new plant, Nucor's fourth buildings systems plant, had a capacity of 45,000 tons and gave Nucor national market reach in buildings systems products.
- In 2006, Nucor initiated construction of a $230 million state-of-the-art steel mill in Memphis, Tennessee, with the annual capacity to produce 850,000 tons of special-quality steel bars. Management believed this mill, together with the company's other special-quality bar mills in Nebraska and South Carolina, would give Nucor the broadest, highest-quality, and lowest-cost special-quality steel bar offering in North America.
- In 2009, Nucor opened an idle and newly renovated $50 million wire rod and bar mill in Kingman, Arizona, that had been acquired in 2003. Production of straight-length rebar, coiled rebar, and wire rod began in mid-2010; the plant had an initial capacity of 100,000 tons and the ability to increase annual production to 500,000 tons.
- Also in 2009, Nucor began production at a new facility in Blytheville, Arkansas, which used the breakthrough Castrip technology to cast molten steel into near-final shape and thickness with minimal hot or cold rolling. This innovative production process entailed both lower capital investment and lower operating costs, plus it reduced the environmental impact of producing steel.
- A new $150 million galvanizing facility located at the company's sheet steel mill in Decatur, Alabama, began operations in mid-2009. This facility gave Nucor the ability to make 500,000 tons of 72-inch-wide galvanized sheet steel, a product used by motor vehicle and appliance producers and in various steel frame and steel stud buildings. The galvanizing process entailed dipping steel in melted zinc at extremely high temperatures; the zinc coating protected the steel surface from corrosion.

The Drive for Plant Efficiency and Low-Cost Production

A key part of Nucor's production strategy was to make ongoing capital investments to improve efficiency and lower production costs at each and every facility it operated. From its earliest days in the steel business, Nucor had built state-of-the-art facilities in the most economical fashion possible and then made it standard company practice to invest in plant modernization and efficiency improvements as technology advanced and new cost-saving opportunities emerged. Nucor management made a point of staying on top of the latest advances in steelmaking around the world, diligently searching for emerging cost-effective technologies it could adopt or adapt in

its facilities. Executives at Nucor had a long-standing commitment to provide the company's workforce with the best technology available to get the job done safely and to do it in an environmentally responsible manner. When Nucor acquired plants, it immediately began bringing them up to Nucor standards—a process it called "Nucorizing." This included increasing operational efficiency by reducing the amount of time, space, energy, and manpower it took to produce steel or steel products and paying close attention to worker safety and environmental protection practices.

Nucor management also stressed continual improvement in product quality and cost at each one of its production facilities. Almost all of Nucor's production locations were ISO 9000– and ISO 14000–certified. The company had a "BESTmarking" program aimed at being the industrywide best performer on a variety of production and efficiency measures. Managers at all Nucor plants were accountable for demonstrating that their operations were competitive on both product quality and cost vis-à-vis the plants of rival companies. One trait of Nucor's corporate culture was the expectation that plant-level managers would be persistent in implementing methods to improve product quality and keep costs per ton low relative to rival plants. Nucor's capital expenditures for new technology, plant improvements, and equipment upgrades in 2000–2013 are shown in Exhibit 5.

Nucor management viewed the task of optimizing its manufacturing operations as a continuous process. According to former CEO Dan DiMicco:[6]

> We talk about "climbing a mountain without a peak" to describe our constant improvements. We can take pride in what we have accomplished, but we are never satisfied.

Shift of Production from Lower-End Steel Products to Value-Added Products

During 2010–2013, Nucor undertook a number of actions to shift more of the production tonnage at its steel mills and steel product facilities to "value-added products" that could command higher prices and yield better profit margins than could be had by producing lower-end or commodity steel products. Examples included:

- Adding new galvanizing capability at the Decatur, Alabama, mill that enabled Nucor to sell 500,000 tons of corrosion-resistant, galvanized sheet steel for high-end applications.
- Expanding the cut-to-length capabilities at the Tuscaloosa, Alabama, mill that put the mill in position to sell as many as 200,000 additional tons per year of cut-to-length and tempered steel plate.
- Shipping 250,000 tons of new steel plate and structural steel products in 2010 that were not offered in 2009, and further increasing shipments of these new products to 500,000 tons in 2011.
- Completing installation of a heat-treating facility at the Hertford County plate mill in 2011 that gave Nucor the capability to produce as much as 125,000 tons annually of heat-treated steel plate ranging from 3/16 of an inch through 2 inches thick.
- Installing new vacuum degassers at the Hickman, Arkansas, sheet mill and Hertford County, North Carolina, mill to enable these two facilities to produce increased volumes of higher-grade sheet steel and steel plate. The degasser at the Hickman plant facilitated production of higher-value steel piping and tubular products used in the oil and gas industry.

EXHIBIT 5 Nucor's Capital Expenditures for New Plants, Plant Expansions, New Technology, Equipment Upgrades, and Other Operating Improvements, 2000–2013

Year	Capital Expenditures (millions)	Year	Capital Expenditures (millions)
2000	$415.0	2007	$ 520.4
2001	261.0	2008	1,019.0
2002	244.0	2009	390.5
2003	215.4	2010	345.2
2004	285.9	2011	450.6
2005	331.5	2012	1,019.3
2006	338.4	2013	1,230.4

Sources: Company records, www.nucor.com; data for 2009–2013 are from the 2013 10-K report, p. 43.

- Investing $290 million at its three steel bar mills to enable the production of steel bars and wire rods for the most demanding engineered bar applications and also put in place state-of-the-art quality inspection capabilities. The project enabled Nucor to offer higher-value steel bars and wire rods to customers in the energy, automotive, and heavy truck and equipment markets (where the demand for steel products had been particularly strong in recent years).
- Completing installation of a new 120,000-ton "normalizing" process for making steel plate at the Hertford County mill in June 2013; the new normalizing process allowed the mill to produce a higher grade of steel plate that was less brittle and had a more uniform fine-grained structure (which permitted the plate to be machined to more precise dimensions). Steel plate with these qualities was more suitable for armor plate applications and for certain uses in the energy, transportation, and shipbuilding industries. Going into 2014, the normalizing process, coupled with the company's recent investments in a vacuum tank degasser and a heat-treating facility at the same plant, doubled the Hertford mill's capacity to produce higher-quality steel plate products that commanded a higher market price.
- Modernizing the casting, hot-rolling, and downstream operations at the Berkeley, South Carolina, mill to enable, starting in the first quarter of 2014, the production of 72-inch-wide sheet steel and lighter-gauge hot-rolled and cold-rolled steel products with a finished width of 72 inches that were used in an assortment of high-strength and ultra-high-strength applications. This product line expansion opened opportunities for Nucor to sell higher-value sheet steel products to customers in the agricultural, pipe and tube, industrial equipment, automotive, and heavy equipment industries.

Several product upgrades had also been undertaken at several Nucor facilities making cold-finished and fastener products. Senior management believed that all of these upgraded product offerings would contribute to higher revenues and earnings when market demand for steel products turned upward.

Global Growth via Joint Ventures

In 2007, Nucor management decided it was time to begin building an international growth platform. The company's strategy to grow its international revenues had two elements:

- *Establishing foreign sales offices and exporting U.S.-made steel products to foreign markets.* Because about 60 percent of Nucor's steelmaking capacity was located on rivers with deep-water transportation access, management believed that the company could be competitive in shipping U.S.-made steel products to customers in a number of foreign locations.
- *Entering into joint ventures with foreign partners to invest in steelmaking projects outside North America.* Nucor executives believed that the success of this strategy element was finding the right partners to grow with internationally.

Nucor opened a trading office in Switzerland and proceeded to establish international sales offices in Mexico, Brazil, Colombia, the Middle East, and Asia. The company's trading office bought and sold steel and steel products that Nucor and other steel producers had manufactured. In 2010, approximately 11 percent of the shipments from Nucor's steel mills were exported. Customers in South and Central America presented the most consistent opportunities for export sales, but there was growing interest from customers in Europe and other locations.

In January 2008, Nucor entered in a 50-50 joint venture with the European-based Duferco Group to establish the production of beams and other long products in Italy, with distribution in Europe and North Africa. A few months later, Nucor acquired 50 percent of the stock of Duferdofin-Nucor S.r.l. for approximately $667 million (Duferdofin was Duferco's Italy-based steelmaking subsidiary). In 2013, Duferdofin-Nucor operated, at various locations, a steel melt shop and bloom/billet caster with an annual capacity of 1.1 million tons, two beam-rolling mills with a combined capacity of 1.1 million tons, a 495,000-ton merchant bar mill, and a 60,000-ton trackshoes/cutting edges mill. The customers for the products produced by Duferdofin-Nucor were primarily steel service centers and distributors located both in Italy and throughout Europe. So far, the joint venture project had not lived up to the partners' financial expectations because all of the plants made construction-related products. The European construction industry had been hard hit by the economic events of 2008–2009, and the construction-related demand for steel products in Europe was

very slowly creeping back toward precrisis levels. During the second quarter of 2012, Nucor recorded an impairment charge of $30 million against its investment in Duferdofin-Nucor. In 2013, the Duferdofin-Nucor venture was unprofitable, but the loss was smaller than that in 2012. Nucor's investment in Duferdofin-Nucor at December 31, 2013, was $465.4 million.

In early 2010, Nucor invested $221.3 million to become a 50-50 joint venture partner with Mitsui USA to form NuMit LLC—Mitsui USA was the largest wholly owned subsidiary of Mitsui & Co., Ltd., a diversified global trading, investment, and service enterprise headquartered in Tokyo, Japan. NuMit LLC owned 100 percent of the equity interest in Steel Technologies LLC, an operator of 25 sheet steel processing facilities throughout the United States, Canada, and Mexico. The NuMit partners agreed that Nucor's previously announced plans to construct a new flat-rolled processing center in Monterrey, Mexico, would be implemented by Steel Technologies. The NuMit joint venture was profitable in both 2012 and 2013. At the end of 2013, Nucor's investment in NuMit was $318.4 million, which consisted of the initial investment plus additional capital contributions and equity method earnings less distributions to Nucor; Nucor had loaned Steel Technologies $40 million that was due in October 2014 and had also extended a $100 million line of credit to Steel Technologies (of which $17 million was outstanding as of December 31, 2013).

Nucor's Raw-Materials Strategy

Scrap metal and scrap substitutes were Nucor's single biggest cost—all of Nucor's steel mills used electric arc furnaces to make steel products from recycled scrap steel, scrap iron, pig iron, hot briquetted iron (HBI), and direct reduced iron (DRI). On average, it took approximately 1.1 tons of scrap and scrap substitutes to produce a ton of steel—the proportions averaged about 70 percent scrap steel and 30 percent scrap substitutes. Nucor was the biggest user of scrap metal in North America, and it also purchased millions of tons of pig iron, HBI, DRI, and other iron products annually—top-quality scrap substitutes were especially critical in making premium grades of sheet steel, steel plate, and special-quality bar steel at various Nucor mills. Scrap prices were driven by market demand–supply conditions and could fluctuate significantly—see Exhibit 6. Rising scrap prices adversely impacted the company's costs and ability to compete against steelmakers that made steel from scratch using iron ore, coke, and traditional blast furnace technology.

EXHIBIT 6 Nucor's Costs for Scrap Steel and Scrap Substitute, 2000–2013

Period	Average Cost of Scrap and Scrap Substitute per Ton Used	Period	Average Cost of Scrap and Scrap Substitute per Ton Used
2000	$120	**2012**	
2001	101	Quarter 1	$445
2002	110	Quarter 2	427
2003	137	Quarter 3	380
2004	238	Quarter 4	372
2005	244	**Full-year average**	407
2006	246	**2013**	
2007	278	Quarter 1	$379
2008	438	Quarter 2	377
2009	303	Quarter 3	372
2010	351	Quarter 4	377
2011	439	**Full-year average**	376

Sources: Nucor's annual reports, 2011, 2009, 2007; and information in the Investor Relations section at www.nucor.com (accessed October 25, 2006, April 12, 2012, and April 15, 2014).

Nucor's raw-materials strategy was aimed at achieving greater control over the costs of all types of metallic inputs (both scrap metal and iron-related substitutes) used at its steel plants. A key element of this strategy was to backward-integrate into the production of 6 million to 7 million tons per year of high-quality scrap substitutes (chiefly pig iron and direct reduced iron) either at its own wholly owned and operated plants or at plants jointly owned by Nucor and other partners—integrating backward into supplying a big fraction of its own iron requirements held the promise of raw-material savings and less reliance on outside iron suppliers. The costs of producing pig iron and DRI were not as subject to steep swings as was the price of scrap steel.

Nucor's first move to execute its long-term raw-material strategy came in 2002 when it partnered with The Rio Tinto Group, Mitsubishi Corporation, and Chinese steelmaker Shougang Corporation to pioneer Rio Tinto's HIsmelt technology at a new plant to be constructed in Kwinana, Western Australia. The HIsmelt technology entailed converting iron ore to liquid metal or pig iron and was both a replacement for traditional blast furnace technology and a hot-metal source for electric arc furnaces. Rio Tinto had been developing the HIsmelt technology for 10 years and believed the technology had the potential to revolutionize iron making and provide low-cost, high-quality iron for making steel. Nucor had a 25 percent ownership in the venture and had a joint global marketing agreement with Rio Tinto to license the technology to other interested steel companies. The Australian plant represented the world's first commercial application of the HIsmelt technology; it had a capacity of over 880,000 tons and was expandable to 1.65 million tons at an attractive capital cost per incremental ton. Production started in January 2006. However, the joint venture partners opted to permanently close the HIsmelt plant in December 2010 because the project, while technologically acclaimed, proved to be financially unviable. Nucor's loss in the joint venture partnership amounted to $94.8 million.

In April 2003, Nucor entered a joint venture with Companhia Vale do Rio Doce (CVRD) to construct and operate an environmentally friendly $80 million pig iron project in northern Brazil. The project, named Ferro Gusa Carajás, utilized two conventional mini-blast furnaces to produce about 418,000 tons of pig iron per year, using iron ore from CVRD's Carajás mine in northern Brazil. The charcoal fuel for the plant came exclusively from fast-growing eucalyptus trees in a cultivated forest in northern Brazil owned by a CVRD subsidiary. The cultivated forest removed more carbon dioxide from the atmosphere than the blast furnace emitted, thus counteracting global warming—an outcome that appealed to Nucor management. Nucor invested $10 million in the project and was a 22 percent owner. Production of pig iron began in the fourth quarter of 2005; the joint venture agreement called for Nucor to purchase all of the plant's production. However, Nucor sold its interest in the project to CVRD in April 2007.

Nucor's third raw-material sourcing initiative came in 2004 when it acquired an idled direct reduced iron plant in Louisiana, relocated all of the plant assets to Trinidad (an island off the coast of South America, near Venezuela), and expanded the project (named Nu-Iron Unlimited) to a capacity of 2 million tons. The plant used a proven technology that converted iron ore pellets into direct reduced iron. The Trinidad site was chosen because it had a long-term and very cost-attractive supply of natural gas (large volumes of natural gas were consumed in the plant's production process), along with favorable logistics for receiving iron ore and shipping direct reduced iron to Nucor's steel mills in the United States. Nucor entered into contracts with natural gas suppliers to purchase natural gas in amounts needed to operate the Trinidad plant through 2028. Production began in January 2007. Nu-Iron personnel at the Trinidad plant had recently achieved world-class product quality levels in making DRI; this achievement allowed Nucor to use an even larger percentage of DRI in producing the most demanding steel products.

In September 2010, Nucor announced plans to build a $750 million DRI facility with an annual capacity of 2.5 million tons on a 4,000-acre site in St. James Parish, Louisiana. This investment moved Nucor two-thirds of the way to its long-term objective of being able to supply 6 million to 7 million tons of its requirements for high-quality scrap substitutes. However, the new DRI facility was the first phase of a multiphase plan that included a second 2.5-million-ton DRI facility, a coke plant, a blast furnace, an iron ore pellet plant, and a steel mill. Permits for both DRI plants were received from the Louisiana Department of Environmental Quality in January 2011. Construction of the first DRI unit at the St. James site began in 2011, and production began in late 2013 and was

rapidly ramped up toward capacity in 2014. Because producing DRI was a natural gas–intensive process, Nucor had entered into a long-term, onshore natural gas working-interest drilling program with Encana Oil & Gas, one of North America's largest producers of natural gas, to help offset the company's exposure to future increases in the price of natural gas consumed by the DRI facility in St. James Parish. Nucor entered into a second and more significant drilling program with Encana in 2012. All natural gas from Nucor's working-interest drilling program was being sold to outside parties. In December 2013, Nucor and Encana agreed to temporarily suspend drilling new gas wells because of expectations that the natural gas pricing environment would be weak in 2014. By the middle of 2014, when all of the in-process wells were completed, Nucor management believed that the over 300 producing wells would provide a full hedge against the Louisiana DRI plant's expected consumption of natural gas into 2015. Nucor had the option to resume drilling operations in the event that a higher natural gas pricing environment made it prudent to do so.

In 2014, a Nucor official indicated that Nucor's use of DRI in its steel mills gave the company an approximate $75-per-ton cost advantage in producing a ton of steel over traditional integrated steel mills using conventional blast furnace technology.[7]

Acquisition of the David J. Joseph Company In February 2008, Nucor acquired the David J. Joseph Company (DJJ) and related affiliates for a cash purchase price of approximately $1.44 billion, the largest acquisition in Nucor's history. DJJ was one of the leading scrap metal companies in the United States, with 2007 revenues of $6.4 billion. It processed about 3.5 million tons of scrap iron and steel annually at 35 scrap yards and brokered over 20 million tons of iron and steel scrap and over 500 million pounds of nonferrous materials in 2007. It obtained scrap from industrial plants, the manufacturers of products that contained steel, independent scrap dealers, peddlers, auto junkyards, demolition firms, and other sources. The DJJ Mill and Industrial Services business provided logistics and metallurgical blending operations and offered onsite handling and trading of industrial scrap. The DJJ Rail Services business owned over 2,000 railcars dedicated to the movement of scrap metals and offered complete railcar fleet management and leasing services. Nucor was familiar with DJJ and its various operations because it had obtained scrap from DJJ since 1969. Most importantly, though, all of DJJ's businesses had strategic value to Nucor in helping gain control over its scrap metal costs. Within months of completing the DJJ acquisition (which was operated as a separate subsidiary), the DJJ management team acquired four other scrap-processing companies. Additional scrap processors were acquired during 2010–2012, and several new scrap yards were opened. As of early 2014, DJJ had expanded to 76 operating facilities in 16 states (along with multiple brokerage offices in the United States and certain foreign countries) and added over 1.7 million tons of scrap-processing capacity, giving Nucor a total annual scrap-processing capacity of 5.2 million tons. And, because of DJJ's railcar fleet, Nucor had the ability to improve the cost and speed with which scrap could be delivered to its steel mills.

Nucor's Commitment to Being a Global Leader in Environmental Performance

Every Nucor facility was evaluated for actions that could be taken to promote greater environmental sustainability. Measurable objectives and targets relating to such outcomes as reduced use of oil and grease, more efficient use of electricity, and sitewide recycling were in place at each plant. Computerized controls on large electric motors and pumps and energy-recovery equipment to capture and reuse energy that otherwise would be wasted had been installed throughout Nucor's facilities to lower energy usage—Nucor considered itself to be among the most energy-efficient steel companies in the world. All of Nucor's facilities had water-recycling systems. Nucor even recycled the dust from its electric arc furnaces because scrap metal contained enough zinc, lead, chrome, and other valuable metals to recycle into usable products; the dust was captured in each plant's state-of-the-art baghouse air pollution control devices and then sent to a recycler that converted the dust into zinc oxide, steel slag, and pig iron. The first Nucor mill received ISO 14001 Environmental Management System (EMS) certification in 2001; as of year-end 2013, 49 Nucor facilities has ISO 14001 EMS certifications in place and efforts were under way for dozens more to receive certification in the future.

Nucor's sheet mill in Decatur, Alabama, used a measuring device called an *opacity monitor,* which

gave precise, minute-by-minute readings of the air quality that passed through the bag house and out of the mill's exhaust system. While rival steel producers had resisted using opacity monitors (because they documented any time a mill's exhaust was out of compliance with its environmental permits, even momentarily), Nucor's personnel at the Decatur mill viewed the opacity monitor as a tool for improving environmental performance. They developed the expertise to read the monitor so well that they could pinpoint in just a few minutes the first signs of a problem in any of the nearly 7,000 bags in the bag house—before those problems resulted in increased emissions. Their early-warning system worked so well that the division applied for a patent on the process, with an eye toward licensing it to other companies.

Organization and Management Philosophy

Nucor had a simple, streamlined organizational structure to allow employees to innovate and make quick decisions. The company was highly decentralized, with most day-to-day operating decisions made by group or plant-level general managers and their staff. Each group or plant operated independently as a profit center and was headed by a general manager, who in most cases also had the title of vice president.

The organizational structure at a typical plant had four layers:

- General manager
- Department manager
- Supervisor or professional
- Hourly employee

Group managers and general managers of plants reported to one of five executive vice presidents at corporate headquarters. Nucor's corporate staff was exceptionally small, consisting of about 100 people in 2013, the philosophy being that corporate headquarters should consist of a small cadre of executives who would guide a decentralized operation where liberal authority was delegated to managers in the field. Each plant had a sales manager who was responsible for selling the products made at that particular plant; such staff functions as engineering, accounting, and personnel management were performed at the group and/or plant level. There was a minimum of paperwork and bureaucratic systems. Each group or plant was expected to earn about a 25 percent return on total assets before corporate expenses, taxes, interest, or profit sharing. As long as plant managers met their profit targets, they were allowed to operate with minimal restrictions and interference from corporate headquarters. A very friendly spirit of competition existed among the plants to see which facility could be the best performer, but since all of the vice presidents and general managers shared the same bonus systems, they functioned pretty much as a team despite operating their facilities individually. Top executives did not hesitate to replace group or plant managers who consistently struggled to achieve profitability and operating targets.

Workforce Compensation Practices

Nucor was a largely nonunion, "pay-for-performance" company with an incentive compensation system that rewarded goal-oriented individuals and did not put a maximum on what they could earn. All employees, except those in the recently acquired Harris Steel and DJJ subsidiaries that operated independently from the rest of Nucor, worked under one of four basic compensation plans, each featuring incentives related to meeting specific goals and targets:

1. *Production Incentive Plan.* Production line jobs were rated on degree of responsibility required and were assigned a base wage comparable to the wages paid by other manufacturing plants in the area where a Nucor plant was located. But in addition to their base wage, operating and maintenance employees were paid weekly bonuses based on the number of tons by which the output of their production team or work group exceeded the "standard" number of tons. All operating and maintenance employees were members of a production team that included the team's production supervisor, and the tonnage produced by each work team was measured for each work shift and then totaled for all shifts during a given week. If a production team's weekly output beat the weekly standard, team members (including the team's production supervisor) earned a specified percentage bonus for each ton produced above the standard—production bonuses were paid weekly (rather than quarterly or annually) so that workers and supervisors would be rewarded immediately for their efforts. The standard rate was calculated based on the capabilities of the equipment employed (typically at the time plant operations began), and no bonus was paid if the equipment was not operating

(which gave maintenance workers a big incentive to keep a plant's equipment in good working condition)—Nucor's philosophy was that when equipment was not operating, everybody suffered and the bonus for downtime ought to be zero. Production standards at Nucor plants were seldom raised unless a plant underwent significant modernization or important new pieces of equipment were installed that greatly boosted labor productivity. It was common for production incentive bonuses to run from 50 to 150 percent of an employee's base pay, thereby pushing compensation levels up well above those at other nearby manufacturing plants. Worker efforts to exceed the standard and get a bonus were less involved with working harder than with engaging in good teamwork and close collaboration to resolve problems and figure out how best to exceed the production standards.

2. *Department Manager Incentive Plan.* Department managers earned annual incentive bonuses based primarily on the percentage of net income generated to dollars of assets employed for their division. These bonuses could be as much as 80 percent of a department manager's base pay.
3. *Professional and Clerical Bonus Plan.* A bonus based on a division's net income return on assets was paid to employees who were not on the production worker or department manager plan.
4. *Senior Officers Annual Incentive Plan.* Nucor's senior officers did not have employment contracts and did not participate in any pension or retirement plans. Their base salaries were set at approximately 90 percent of the median base salary for comparable positions in other manufacturing companies with comparable assets, sales, and capital. The remainder of their compensation was based on Nucor's annual overall percentage of net income to stockholders' equity (ROE) and was paid out in cash and stock. Once Nucor's ROE reached a threshold of not less than 3 percent or more than 7 percent (as determined annually by the compensation committee of the board of directors), senior officers earned a bonus equal to 20 percent of their base salary. If Nucor's annual ROE was 20 percent or higher, senior officers earned a bonus equal to 225 percent of their base salary. Officers could earn an additional bonus up to 75 percent of their base salary based on a comparison of Nucor's net sales growth with the net sales growth of members of a steel industry peer group. There was also a long-term incentive plan that provided for stock awards and stock options. The structure of these officer incentives was such that bonus compensation for Nucor officers fluctuated widely—from close to zero (in years like 2003 when industry conditions were bad and Nucor's performance was subpar) to 400 percent (or more) of base salary (when Nucor's performance was excellent, as had been the case in 2004–2008). Based on Nucor's 2013 ROE of 6.4 percent and its second-place ranking in net sales performance within the steel industry peer group, Nucor's executive officers earned an annual incentive award of (1) 60.97 percent of base salary for the ROE performance measure and (2) an additional 60 percent of base salary for favorable net sales performance relative to the peer group.

   Senior Officers Long-Term Incentive Plan. The long-term incentive was intended to balance the short-term focus of the annual incentive plan by rewarding performance over multiyear periods. Long-term incentives were received in the form of cash (50 percent) and restricted stock (50 percent) and covered a performance period of three years; 50 percent of the long-term award was based on how Nucor's three-year return on average invested capital (ROAIC) compared against the three-year ROAIC of the steel industry peer group, and 50 percent was based on how Nucor's three-year ROAIC compared against a multi-industry group of well-respected companies in capital-intensive businesses similar to that of steel. Nucor's ROAIC of 15.23 percent for the long-term incentive plan performance period that began January 1, 2011, and ended December 31, 2013, ranked 2nd relative to the 6 members of the steel industry peer group and ranked 10th relative to the 11 members of the multi-industry peer group. This produced stock issue and cash awards of 80 percent of the maximum payout based on the peer-group comparison and zero stock and cash awards based on the multi-industry peer-group comparison.

Nucor management had designed the company's incentive plans for employees so that bonus calculations involved no discretion on the part of a plant or division manager or top executives. This was done to eliminate any concerns on the part of workers that managers or executives might show favoritism or otherwise be unfair in calculating or awarding incentive awards.

There were two other types of extra compensation:

- *Profit sharing.* Each year, Nucor allocated 10 percent of its operating profits to profit-sharing bonuses for all employees (except senior officers). Depending on company performance, the bonuses could run anywhere from 1 percent to over 20 percent of pay. Of the bonus amount, 20 percent was paid to employees in the following March as a cash bonus, and the remaining 80 percent was put into a trust for each employee, with each employee's share being proportional to his or her earnings as a percentage of total earnings by all workers covered by the plan. An employee's share of profit sharing became vested after one full year of employment. Employees received a quarterly statement of their balance in profit sharing.
- *401(k) plan.* Both officers and employees participated in a 401(k) plan whereby the company matched from 5 to 25 percent of each employee's first 7 percent of contributions; the amount of the match was based on how well the company was doing.

In 2013, an entry-level worker at a Nucor plant could expect to earn about $47,000 to $50,000 annually (including bonuses). Total compensation for Nucor's plant employees in 2013 was in the range of $70,000 to $100,000 annually. It was common for worker compensation at Nucor plants to be double or more the average earned by workers at other manufacturing companies in the states where Nucor's plants were located. At Nucor's plant in Hertford County, North Carolina, where jobs were scarce and poverty was common, Nucor employees earned three times the local average manufacturing wage. Nucor management philosophy was that workers ought to be excellently compensated because the production jobs were strenuous and the work environment in a steel mill was relatively dangerous.

Employee turnover in Nucor mills was extremely low (6 percent in 2013); absenteeism and tardiness were minimal. Each employee was allowed four days of absences and could also miss work for jury duty, military leave, or the death of close relatives. After this, a day's absence cost a worker the entire performance bonus pay for that week, and being more than a half-hour late to work on a given day resulted in no bonus payment for the day. When job vacancies did occur, Nucor was flooded with applications from people wanting to get a job at Nucor; plant personnel screened job candidates very carefully, seeking people with initiative and a strong work ethic.

Employee Relations and Human Resources

Employee relations at Nucor were based on four clear-cut principles:

1. Management is obligated to manage Nucor in such a way that employees will have the opportunity to earn according to their productivity.
2. Employees should feel confident that if they do their jobs properly, they will have a job tomorrow.
3. Employees have the right to be treated fairly and must believe that they will be.
4. Employees must have an avenue of appeal when they believe they are being treated unfairly.

The hallmarks of Nucor's human resource strategy were its incentive pay plan for production exceeding the standard and the job security provided to production workers—despite being in an industry with strong down cycles, Nucor had made it a practice not to lay off workers. Instead, when market conditions were tough and production had to be cut back, workers were assigned to plant maintenance projects, cross-training programs, and other activities calculated to boost the plant's performance when market conditions improved.

Nucor took an egalitarian approach to providing fringe benefits to its employees; employees had the same insurance programs, vacation schedules, and holidays as upper-level managers. However, certain benefits were not available to Nucor's officers. The fringe-benefit package at Nucor included:

- *Medical and dental plans.* The company had a flexible and comprehensive health benefit program for officers and employees that included wellness and health care spending accounts.
- *Tuition reimbursement.* Nucor reimbursed up to $3,000 of an employee's approved educational expenses each year and up to $1,500 of a spouse's educational expenses for two years.
- *Service awards.* After each five years of service with the company, Nucor employees received a service award consisting of five shares of Nucor stock.
- *Scholarships and educational disbursements.* Nucor provided the children of every employee

(except senior officers) with college funding of $3,000 per year for four years to be used at accredited academic institutions. As of 2011, Nucor had paid out over $61 million.

- *Other benefits.* Long-term disability, life insurance, vacation time.

Most of the changes Nucor made in work procedures came from employees. The prevailing view at Nucor was that the employees knew the problems of their jobs better than anyone else and were thus in the best position to identify ways to improve how things were done. Most plant-level managers spent considerable time in the plant, talking and meeting with frontline employees and listening carefully to suggestions. Promising ideas and suggestions were typically acted upon quickly and implemented—management was willing to take risks to try worker suggestions for doing things better and to accept the occasional failure when the results were disappointing. Teamwork, a vibrant team spirit, and a close worker–management partnership were much in evidence at Nucor plants.

Nucor plants did not utilize job descriptions. Management believed job descriptions caused more problems than they solved, given the teamwork atmosphere and the close collaboration among workgroup members. The company saw formal performance appraisal systems as a waste of time and added paperwork. If a Nucor employee was not performing well, the problem was dealt with directly by supervisory personnel and the peer pressure of work-group members (whose bonuses were adversely affected).

Employees were kept informed about company and division performance. Charts showing the division's results in return-on-assets and bonus payoff were posted in prominent places in the plant. Most all employees were quite aware of the level of profits in their plant or division. Nucor had a formal grievance procedure, but grievances were few and far between. The corporate office sent all news releases to each division, where they were posted on bulletin boards. Each employee received a copy of Nucor's annual report; it was company practice for the cover of the annual report to consist of the names of all Nucor employees.

All of these practices had created an egalitarian culture and a highly motivated workforce that grew out of former CEO Ken Iverson's radical insight: Employees, even hourly clock punchers, would put forth extraordinary effort and be exceptionally productive if they were richly rewarded, treated with respect, and given real power to do their jobs as best they saw fit.[8] There were countless stories of occasions when managers and workers had gone beyond the call of duty to expedite equipment repairs (in many instances even using their weekends to go help personnel at other Nucor plants solve a crisis); the company's workforce was known for displaying unusual passion and company loyalty even when no personal financial stake was involved. As one Nucor worker put it, "At Nucor, we're not 'you guys' and 'us guys.' It's all of us guys. Wherever the bottleneck is, we go there, and everyone works on it."[9]

It was standard procedure for a team of Nucor veterans, including people who worked on the plant floor, to visit their counterparts as part of the process of screening candidates for acquisition.[10] One of the purposes of such visits was to explain the Nucor compensation system and culture face-to-face, gauge reactions, and judge whether the plant would fit into "the Nucor way of doing things" if it was acquired. Shortly after making an acquisition, Nucor management moved swiftly to institute its pay-for-performance incentive system and to begin instilling the egalitarian Nucor culture and idea sharing. Top priority was given to looking for ways to boost plant production by using fewer people and without making substantial capital investments; the take-home pay of workers at newly acquired plants typically went up rather dramatically. At the Auburn Steel plant, acquired in 2001, it took Nucor about six months to convince workers that they would be better off under Nucor's pay system; during that time Nucor paid people under the old Auburn Steel system but posted what they would have earned under Nucor's system. Pretty soon, workers were convinced to make the changeover—one worker saw his pay climb from $53,000 in the year prior to the acquisition to $67,000 in 2001 and to $92,000 in 2005.[11]

New Employees Each plant and division had a "consul" who provided new employees with general advice about becoming a Nucor teammate and who served as a resource for inquiries about how things were done at Nucor, how to navigate the division and company, and how to resolve issues that might come up. Nucor provided new employees with a personalized plan that set forth who would give them feedback about how well they were doing and when and how this feedback would be given;

from time to time, new employees met with the plant manager for feedback and coaching. In addition, there was a new employee orientation session that provided a hands-on look at the plant or division operations; new employees also participated in product-group meetings to provide exposure to broader business and technical issues. Each year, Nucor brought all recent college hires to the Charlotte headquarters for a forum intended to give the new hires a networking opportunity and to provide senior management with guidance on how best to leverage their talent.

THE WORLD STEEL INDUSTRY

Both 2012 and 2013 were record years for the global production of crude steel, with worldwide production reaching 1,703 million tons in 2012 and 1,744 million tons in 2013—see Exhibit 7. Steelmaking capacity worldwide was approximately 2,300 million tons in 2013, resulting in a 2013 capacity utilization rate of 75.8 percent (up from a historically unprecedented low of 52 percent in 2009, but largely unchanged from 2012). Worldwide demand for steel mill products grew an average of about 5.5 percent annually from 2000 to 2013, but the annual growth rate was quite volatile, ranging from a low of 0.01 percent (2007–2008) to a high of 14.5 percent (2010–2011). Worldwide steel demand grew 3.6 percent in 2013 and was forecast to increase about 3.1 percent in 2014 and 3.3 percent in 2015.[12] In North America, after a 2.4 percent decline in steel demand in 2013, the forecast was for increases of 3.8 percent in 2014 and 3.4 percent in 2015.[13]

The six biggest steel-producing countries in 2013 were:

Country	Total Production of Crude Steel	Percent of Worldwide Production
China	859 million tons	49.2
Japan	121 million tons	7.0
United States	96 million tons	5.5
India	89 million tons	5.1
Russia	76 million tons	4.4
South Korea	73 million tons	4.2

Exhibit 8 shows the world's 15 largest producers of steel in 2013.

Steelmaking Technologies

Steel was produced either by integrated steel facilities or by "mini-mills" that employed electric arc furnaces. Integrated mills used blast furnaces to produce hot metal typically from iron ore pellets, limestone, scrap steel, oxygen, assorted other metals, and coke (coke was produced by firing coal in large coke ovens and was the major fuel used in blast furnaces to produce molten iron). Melted iron from the blast furnace process was then run through the basic oxygen process to produce liquid steel. To make flat rolled steel products, liquid steel was either fed into a continuous-caster machine and cast into slabs or else cooled in slab form for later processing. Slabs were further shaped or rolled at a plate mill or hot-strip mill. In making certain sheet steel products, the hot-strip mill process was followed by various finishing processes, including pickling, cold rolling, annealing, tempering, galvanizing, or other coating procedures. These various processes for converting raw steel into finished steel products were often distinct steps undertaken at different times and in different onsite or offsite facilities rather than being done in a continuous process in a single plant facility—an integrated mill was thus one that had multiple facilities at a single plant site and could therefore not only produce crude (or raw) steel but also run the crude steel through various facilities and finishing processes to make hot-rolled and cold-rolled sheet steel products, steel bars and beams, stainless steel, steel wire and nails, steel pipes and tubes, and other finished steel products. The steel produced by integrated mills tended to be purer than steel produced by electric arc furnaces since less scrap was used in the production process (scrap steel often contained nonferrous elements that could adversely affect metallurgical properties). Some steel customers required purer steel products for their applications.

Mini-mills used an electric arc furnace to melt steel scrap or scrap substitutes into molten metal that was then cast into crude steel slabs, billets, or blooms in a continuous-casting process. As was the case at integrated mills, the crude steel was then run through various facilities and finishing processes to make hot-rolled and cold-rolled sheet steel products, steel bars and beams, stainless steel, steel wire and nails, steel pipes and tubes, and other finished steel products. Mini-mills could accommodate short production runs and had a relatively fast product-changeover time. The electric

EXHIBIT 7 Worldwide Production of Crude Steel, with Compound Average Growth Rates, 1975–2013

Year	World Crude Steel Production (millions of tons)	Compound Average Growth Rate in World Crude Steel Production	
		Period	Percentage Rate
1975	709	1975–1980	2.2%
1980	789	1980–1985	0.1%
1985	793	1985–1990	1.4%
1990	849	1990–1995	−0.5%
1995	827	1995–2000	4.5%
2000	1,029	2000–2005	4.2%
2001	1,032	2005–2010	4.6%
2002	996	2010–2013	3.3%
2003	1,069		
2004	1,170		
2005	1,264		
2006	1,377		
2007	1,486		
2008	1,480		
2009	1,364		
2010	1,580		
2011	1,694		
2012	1,703		
2013	1,744		

Sources: Worldsteel Association, *Steel Statistical Yearbook,* various years, and "Crude Steel Production 2013," www.worldsteel.org (accessed April 23, 2014).

arc technology employed by mini-mills offered two primary competitive advantages: capital investment requirements that were 75 percent lower than those of integrated mills and a smaller workforce (which translated into lower labor costs per ton shipped).

Initially, companies that used electric arc furnace technology were able to make only low-end steel products (such as reinforcing rods and steel bars). But when thin-slab casting technology came on the scene in the 1980s, mini-mills were able to compete in the market for flat-rolled carbon sheet and strip products; these products sold at substantially higher prices per ton and thus were attractive market segments for mini-mill companies. Carbon sheet and strip steel products accounted for about 50-60 percent of total steel production and represented the last big market category controlled by the producers employing basic oxygen furnace and blast furnace technologies. Thin-slab casting technology, which had been developed by SMS Schloemann-Siemag AG of Germany, was pioneered in the United States by Nucor at its plants in Indiana and elsewhere. Other mini-mill companies in the United States and across the world were quick to adopt thin-slab casting technology because the low capital costs of thin-slab casting facilities, often coupled with lower labor costs per ton, gave mini-mill companies a cost and pricing advantage over integrated steel producers, enabling them to grab a growing share of the global market for flat-rolled sheet steel and other carbon steel products. Many integrated producers also switched to thin-slab casting as a defensive measure to protect their profit margins and market shares.

In 2011–2013, about 70 percent of the world's steel mill production was made at large integrated mills and about 29 percent was made at mills that used electric arc furnaces. In the United States, however, roughly 60 percent of the steel was produced at mills employing electric arc furnaces and 40 percent at mills using

EXHIBIT 8 Top 15 Producers of Crude Steel Worldwide, 2013

2013 Rank	Company (Headquarters)	Crude Steel Production (millions of tons)		
		2005	2010	2013
1	ArcelorMittal (Luxembourg)	120.9	98.2	96.1
2	Nippon Steel (Japan)	35.3	35.0	50.1
3	Hebei Group (China)	—	—	45.8
4	Baosteel (China)	25.0	37.0	43.9
5	Wuhan Group (China)	14.3	16.6	39.3
6	POSCO (South Korea)	33.6	35.4	38.4
7	Shagang Group (China)	—	23.2	35.1
8	Ansteel Group (China)	13.1	22.1	33.7
9	Shougang Group (China)	—	—	31.5
10	JFE (Japan)	32.9	31.1	31.2
11	Tata Steel Group (India)	—	23.2	25.3
12	Shandong Steel Group (China)	—	—	22.8
13	United States Steel (USA)	21.3	22.3	20.4
14	Nucor (USA)	20.3	18.3	20.2
15	Tianjin Bohai Iron and Steel Group (China)	—	—	19.3

Source: Worldsteel Association, "Top Steel Producers 2013," www.worldsteel.org (accessed July 13, 2014).

blast furnaces and basic oxygen processes. Large integrated steel mills using blast furnaces, basic oxygen furnaces, and assorted casting and rolling equipment typically had the ability to manufacture a wide variety of steel mill products but faced significantly higher energy costs and were often burdened with higher capital and fixed operating costs. Electric arc furnace mill producers were challenged by increases in scrap prices but tended to have lower capital and fixed operating costs compared than the integrated steel producers. However, the quality of the steel produced using blast furnace technologies tended to be superior to that of electric arc furnaces unless, as at many of Nucor's facilities, the user of electric arc furnaces invested in additional facilities and processing equipment to enable the production of upgraded steel products.

The global marketplace for steel was considered to be relatively mature and highly cyclical as a result of ongoing ups and downs in the world economy or the economies of particular countries. However, in 2010–2013, the world steel market was divided into "two separate worlds." In places like Europe, the United States, and Japan, where recovery from the 2008–2009 financial crisis and economic recession was slow, the demand for steel was weak and there was abundant excess steelmaking capacity. In fast-developing areas of the world—like Asia (especially China and India) and a number of countries in Latin America and the Middle East—the demand for steel was much stronger and sometimes exceeded the capacity of local steelmakers, many of which were adding new capacity.

In general, competition within the global steel industry was intense and expected to remain so. Companies with excess production capacity were active in seeking to increase their exports of steel to foreign markets. During 2005–2013, the biggest steel-exporting countries were China, Japan, South Korea, Russia, the Ukraine, and Germany; the biggest steel-importing countries during the same period were the United States, Germany, South Korea, Thailand, China, Italy, France, and Turkey. China, Germany, and South Korea were both big exporters and big importers because they had more capacity to make certain types and grades of steel than was needed inside their borders (and thus local steelmakers sought to export supplies to other countries) but lacked sufficient internal capacity to supply local steel users with other types and grades of steel.

Industry Consolidation Both in the United States and across the world, industry downturns and the overhang of excess production capacity had over the years precipitated numerous mergers and acquisitions. Some of the mergers and acquisitions were the result of a financially and managerially strong company seeking to acquire a high-cost or struggling steel company at a bargain price and then pursue cost reduction initiatives to make the newly acquired steel mill operations more cost-competitive. Other mergers and acquisitions, particularly in China, where very significant mergers and acquisitions occurred in the 2005–2012 period, reflected the strategies of growth-minded steel companies that wanted to expand their production capacity and/or geographic market presence.

NUCOR AND COMPETITION IN THE U.S. MARKET FOR STEEL

Nucor's broad product lineup meant that it was an active participant in the markets for a wide variety of finished steel products and unfinished steel products, plus the markets for scrap steel and scrap substitutes. Nucor executives considered all the market segments and product categories in which the company competed to be intensely competitive, with many segments and categories populated with both domestic and foreign rivals. For the most part, competition for steel mill products and finished steel products was centered on price and the ability to meet customer delivery requirements. And, due to global overcapacity, almost all steelmakers were actively seeking new business in any geographic markets where they could find willing buyers.

Since the beginning of 2010, Nucor had encountered escalating competitive pressures in the market for sheet steel in the United States due to:

- The opening of a newly constructed 5-million-ton sheet steel mill in Alabama owned by Thyssen Krupp, a Germany-based steelmaker.
- Capacity additions at several existing domestic sheet mills.
- The reopening of a previously shuttered sheet mill in Maryland.

In addition, Nucor was continually locked in a competitive battle with rivals to win orders from buyers engaged in nonresidential construction. Headed into 2014, Nucor management did not foresee any signs of a meaningful and sustained upswing in nonresidential construction activity, meaning that the company's sales and profits that were based on the many different construction-related steel products included in its product offering would remain under competitive pressure.

Furthermore, over the past four years, Nucor had to contend with mounting competition in a number of product categories from foreign steelmakers seeking to export some of their production to the United States and win customers by undercutting the prices of domestic producers. Imports of foreign steel into the United States more than doubled from 2009 through 2012 (see Exhibit 9). In Nucor's 2013 10-K report, management said:[14]

> Imported steel and steel products continue to present unique challenges for us because foreign producers often benefit from government subsidies, either directly through government-owned enterprises or indirectly through government-owned or controlled financial institutions. Foreign imports of finished and semi-finished steel accounted for approximately 30% of the U.S. steel market in 2013 despite significant unused domestic capacity. Rebar and hot-rolled bar were impacted especially hard by imports in 2013 as imports of these products increased by 23% and 15%, respectively, over 2012 levels. Increased imports of bar have translated into even lower domestic utilization rates for that product—utilization in the mid-60% range—and significant decreases in domestic bar pricing in 2013. Competition from China, the world's largest producer and exporter of steel, which produces more than 45% of the steel produced globally, is a major challenge in particular. We believe that Chinese producers, many of which are government-owned in whole or in part, benefit from their government's manipulation of foreign currency exchange rates and from the receipt of government subsidies, which allow them to sell steel into our markets at artificially low prices.
>
> China is not only selling steel at artificially low prices into our domestic market but also across the globe. When they do so, steel products which would otherwise have been consumed by the local steel customers in other countries are displaced into global markets, which compounds the issue. In a more indirect manner, but still significant, is the import of fabricated steel products, such as oil country tubular goods, wind towers and other construction components that were produced in China.

Many foreign steel producers had costs on a par with or even below those of Nucor, although their competitiveness in the U.S. market varied significantly according to the prevailing strength of their local currencies versus the U.S. dollar and the extent to which they received government subsidies.

Nucor's Two Largest Domestic Competitors

Consolidation of the industry into a smaller number of larger and more efficient steel producers had heightened competitive pressures for Nucor and most other steelmakers. Nucor had two major rivals in the United States—the USA division of ArcelorMittal and United States Steel.

ArcelorMittal USA In 2013, ArcelorMittal USA operated 17 major production facilities, including four large integrated steel mills, six electric arc furnace plants, and four rolling and finishing plants. Its facilities were considered to be modern and efficient. Its product lineup included hot-rolled and cold-rolled sheet steel, steel plate, steel bars, railroad rails, high-quality wire rods, rebars, grinding balls, structural steel, tubular steel, and tin mill products. Much of its production was sold to customers in the automotive, trucking, off-highway, agricultural equipment, and railway industries, with the balance being sold to steel service centers and companies in the appliance, office furniture, electric motor, packaging, and industrial machinery sectors.

Globally, ArcelorMittal was the world's largest steel producer, with 2013 annual production capacity of 119 million tons of crude steel and 2013 steel shipments of 84.3 million tons. It had worldwide sales revenues of $79.4 billion and a net loss of $2.5 billion in 2013 and worldwide sales revenues of $84.2 billion and a net loss of $3.4 billion in 2012.[15] ArcelorMittal's financial reports suggested that its steel operations in the United States were probably profitable in 2013. A portion of ArcelorMittal USA's steel operations were included in the overall company's Flat Carbon Americas business group, which reported 2013 sales of $19.3 billion (down 3 percent from 2012) and operating income of $852 million

EXHIBIT 9 Apparent Consumption of Steel Mill Products in the United States, 2000–2012 (in millions of tons)

Year	U.S. Shipments of Steel Mill Products	U.S. Exports of Steel Mill Products	U.S. Imports of Steel Mill Products	Apparent U.S. Consumption of Steel Mill Products*
2000	109.1	6.5	38.0	140.6
2001	99.1	6.4	30.8	123.5
2002	100.7	6.2	33.3	127.8
2003	103.0	8.5	23.8	118.3
2004	109.6	8.6	36.0	137.0
2005	104.4	10.4	33.2	127.2
2006	108.4	10.5	46.4	144.3
2007	107.9	10.8	30.5	127.6
2008	100.5	13.2	27.1	114.4
2009	64.0	10.2	16.9	70.7
2010	88.5	13.0	24.8	100.3
2011	95.2	14.6	29.4	110.0
2012	97.8	14.9	34.0	116.9

*Apparent U.S. consumption equals total shipments minus exports plus imports.

Source: Worldsteel Association, *Steel Statistical Yearbook,* 2011 and 2013, www.worldsteel.org (accessed April 24, 2014).

(down from $1.0 billion in 2012). The remaining portion of ArcelorMittal USA's steel business was part of the overall company's Long Carbon Americas and Europe business group, which had 2013 sales of $21.0 billion (down 4 percent from 2012) and operating income of $1.1 billion (up from a loss of $512 million in 2012).

U.S. Steel United States Steel was an integrated steel producer of flat-rolled and tubular steel products with major production operations in the United States and Europe. In 2013, it had a crude steel production capacity of 27 million tons, of which 22 million tons was in North America. At the end of 2013, U.S. Steel permanently closed its Hamilton facilities in Ontario, Canada, reducing its North American capacity by 2.3 million tons. In 2012, the company sold all of its steel operations in Serbia to the Republic of Serbia for one dollar, resulting in a loss on the sale of approximately $400 million. In North America, U.S. Steel's production of crude steel was 17.9 million tons in 2013, 19.1 million tons in 2012, and 18.6 million tons in 2011, equal to capacity utilization rates of 74 percent in 2013, 79 percent in 2012, and 77 percent in 2011.

U.S. Steel's operations were organized into three business segments: flat-rolled products (which included all of its integrated steel mills that produced steel slabs, rounds, steel plate, sheet steel, and tin mill products), U.S. Steel Europe, and the tubular product operations. The flat-rolled segment primarily served North American customers in the transportation (including automotive), construction, container, appliance, and electrical industries, plus steel service centers and manufacturers that bought steel mill products for conversion into a variety of finished steel products. In addition, this segment supplied steel rounds and hot-rolled bands needed to produce steel casing and tubular products to the company's tubular business segment; shipments from the flat-rolled segment to the tubular segment totaled 1.7 million tons in 2013, 1.9 million tons in 2012, and 2.2 million tons in 2011. U.S. Steel's flat-rolled business segment had 2013 sales of $11.5 billion and operating income of $105 million, 2012 sales of $12.9 billion and operating income of $400 million, and 2011 sales of $12.4 billion and operating income of $469 million.

U.S. Steel's tubular product operations, located primarily in the United States, produced steel casing and tubing marketed chiefly to customers in the oil, gas, and petrochemicals industries. With annual production capability of 2.8 million tons, U.S. Steel was the largest supplier of steel casing and tubing products in North America. Sales of steel casing and tubular products were $2.8 billion in 2013, $3.3 billion in 2012, and $3 billion in 2011; the tubular segment had operating income of $190 million in 2013, $366 million in 2012, and $316 million in 2011.

U.S. Steel's exports of steel products from the United States totaled 365,000 tons in 2013, 409,000 tons in 2012, and 572,000 tons in 2011. U.S. Steel had a labor cost disadvantage versus Nucor and ArcelorMittal USA, partly due to the lower productivity of its unionized workforce and partly due to its retiree pension costs. In 2013, U.S. Steel launched a series of internal initiatives to "get leaner faster, right-size, and improve our performance."[16]

ENDNOTES

[1] Tom Peters and Nancy Austin, *A Passion for Excellence: The Leadership Difference*, (New York: Random House, 1985), and "Other Low-Cost Champions," *Fortune,* June 24, 1985.
[2] Nucor's 2011 annual report, p. 4.
[3] According to information at www.nucor.com (accessed October 11, 2006).
[4] March 2014 Investor Presentation, www.nucor.com (accessed April 22, 2014).
[5] 2013 10-K report, p. 22.
[6] Nucor's 2008 annual report, p. 5.
[7] March 2014 Investor Presentation.
[8] Nanette Byrnes, "The Art of Motivation," *Businessweek,* May 1, 2006, p. 57.
[9] Ibid., p. 60.
[10] Ibid.
[11] Ibid.
[12] Worldsteel Association press release, April 9, 2014.
[13] Ibid.
[14] Company 10-K report, 2011, p. 6.
[15] Company annual report, 2013.
[16] Company 10-K report, 2013, p. 12.