CHAPTER 10: Future Directions for Steel and Southeast Chicago

The steel-based industrial complex and Chicago's southeast side are both in deep trouble. They have confronted a half-decade of adversity in international and national macroeconomic policies and in domestic industrial restructuring. They have endured large-scale plant shutdowns, an escalation in unemployment, and painful shrinkage for local businesses and other community organizations. Our research suggests that the threat to economic viability remains for both steel and the southeast side, but that opportunities exist as well. The next couple of years will be critical ones for the maintenance and revitalization of the industry and the community.

Our research suggests that a coordinated effort to combat the disintegration of the steel-based industrial complex on the southeast side could be mounted by Chicago's private sector, university, labor and political leadership. In this last chapter, we review a number of new and existing economic development tools which could be brought to bear on the problem. Many are drawn from current innovative efforts in other communities and states. It should be kept in mind that these are suggestions to the Task Force based on the research findings. They are the informed opinions of the research team rather than thoroughly evaluated policy options.

10.1 Basic Steelmaking

Our research found that a large portion of Chicago's remaining capacity is relatively efficient and ideally located with respect to national markets. Steelmaking capacity in the Chicago area has displayed considerable resistance to dispersion and to import penetration, both signs of comparative advantage. These same
comparative advantages offer opportunities for expanding product lines and attracting new facilities. Maintenance and expansion of existing capacity could staunch job loss and reverse the trend toward disintegration of the steel-based industrial complex.

**Retaining Existing Capacity**

In light of the market situation, existing steel mills do merit special attention in weathering this period of intense restructuring. An inventory of existing capacity could be created and an ongoing assessment made of the product lines in which these mills can successfully compete with minimills, imports and other integrated facilities. Where careful analysis points to good bets, selective intervention to encourage new capital investments and/or incentives for labor, materials or energy quality enhancement could bring facilities up to par. State and local governments could draw upon existing tools such as industrial revenue bonds, tax breaks, labor retraining, loan packaging, site improvement and infrastructure provision. A similar "triage" strategy is being pursued in the State of Michigan's auto program, which is attempting to identify, particularly for auto parts and suppliers, promising market segments, and facilities that remain viable.

The emphasis here would be on productivity -- on innovations that enable steelmaking firms to better utilize both energy and labor, given their relatively high cost. In the energy area in particular, there could be major savings in materials handling and energy utilization to mitigate the expected escalation in Chicago-area electricity rates. Labor productivity could be increased by adoption of technologies such as continuous casting, although the expense of
such investments must be weighed carefully against the potential job retention benefits.

**Engendering New Product Innovations**

The steel industry has not exhibited the commitment to pioneering new product innovations which has helped other industries cope with maturity. Yet our research suggests that some excellent opportunities exist for creating better steels and new uses of them to reverse the gains made by substances like aluminum, fiberglass, and plastics, especially in areas like construction and consumer appliances. Product innovations tend to create special clusters which are deeply anchored in the region of origin, unlike process innovations which are highly mobile.

A joint research effort among the area's major engineering schools, the Argonne National Laboratory (which has played a leading role in government-based steel research), and private industry could enhance the existing body of scientific knowledge and lead to an increase in commercial applications. Chicago is home for a large number of the nation's top metallurgical engineers. A prototype of such cooperation is the new microelectronics research center (MCC) in Austin, Texas, a consortium of eight large electronics firms collaborating in basic research.

A joint research program will be more effective if housed in one facility, perhaps in currently underutilized industrial space on the Southeast Side. Use of an abandoned steel facility for a research park has been proposed by the City of Pittsburgh and its two leading universities at the old J & L works, which will be converted into two research institutes, one on robotics and one on biotechnology.
Attracting Steelmaking Concerns Who are Seeking Sites

Despite the troubled state of the domestic industry, new entrepreneurs continue to build steel plants. Recently, for instance, Three Rivers Steel Corporation of Evansville, Indiana, was reported to be seeking a site in Illinois or Indiana for a new minimill using pioneering planetary mill technology ("Three Rivers Steel Plans," 1985). Chicago is attractive both for its excellent resources (labor, land, venture capital, infrastructure, and transportation facilities) and its location. Such entrepreneurial efforts could be courted by joint public and private industrial recruiting teams. Targeting by sector and type of firm could strengthen the City's existing recruitment program.

Anticipate and Respond to Steel Shutdowns

Currently, many Chicago communities, like the Southeast Side, are caught unprepared when a plant shuts down. Often, by the time a strategy for responding to the problems of both labor and management is fashioned, it is too late. A timely and coordinated effort to respond could help mitigate the adjustment costs of workers and communities. In Massachusetts, a Plant Closings Response Unit run in conjunction with their Mature Industries Commission, operates much the way a fire department does when an alarm goes off. It immediately calls upon management, tries to diagnose the problem, surveys available public and private aids, and, if the closing cannot be prevented, brings services for worker training and placement to the site. A similar mechanism for Chicago might be designed.

Second, our research suggests that some of the most successful turnarounds in steel have occurred when new managements have taken
over. This has taken various forms -- buyouts or spinoffs to outside entrepreneurs, former managers, and worker owners. New and existing mechanisms, such as public authorities and eminent domain, might be explored as a means of engendering such changeovers when the economics of the facility warrant it. This is akin to what many of the nation's cities have done in the urban renewal programs that have transformed central business districts. In Pittsburgh, the City and nine of its nearby boroughs have set up a Steel Valley Authority to accomplish this with selected shuttered steel properties.

10.2 Steel-Using Industries

Our research disclosed that a substantial share of the steel industry's difficulties originate in capital goods and consumer durables industries which consume the bulk of Chicago area steel. In particular, the heavy machinery industries and their fabricated metals suppliers have been hard hit by the changing international situation. These are industries whose exports continue to contribute significantly to the positive side of the nation's trade balance, even though their ability to export has been heavily depressed by adverse exchange rates and third world debt constraints. On the other hand, their performance in home markets has not been salutary. Lack of innovation has permitted foreign suppliers, particularly the Japanese and Europeans, to penetrate certain market segments in machine tools, consumer appliances, farm machinery and transportation equipment. These industries are also a prime target for industrial renewal.

An Ongoing Durables Manufacturing Outreach Program

A joint public-private effort might be mounted to nurture and build upon the agglomeration factors which keep the steel-based
complex intact. A mechanism could be created to more expeditiously alert suppliers and customers to severe difficulties on the part of a particular plant whose demise might adversely affect them (a la Great Lakes Supply in Chapter 1). Timely notification might facilitate the extension of credit by a set of suppliers or clients and/or the offer of an equity stake which would help the troubled plant over the hump. Banking partners could be brought in to enhance such pooled resources.

Establishing a Durable Industries' Product Innovation Lab

The relatively poor performance of many mainstay midwestern industries in meeting competition suggests that product innovation has been slighted. The remarkable gains of imports in areas like smaller tractors, buses and rapid transit equipment, machine tools, and consumer items from coffee grinders to VCR's suggest that a cooperative research lab might really pay off in these areas. Chicago is admirably suited to hosting this type of activity because of its central location and the fact that it houses many of these plants already.

A durables manufacturing product innovation lab could be run in conjunction with the steel product innovation effort outlined above. A site in underutilized industrial property on the southeast side might be developed for this effort, where inexpensive space for experimentation and commercial spinoffs could be found nearby. As products emerge from the lab, state and private sector funding for commercialization could be sought.

Courting Entrepreneurs Who Seek Funding and Sites for Durables Production

Entrepreneurial efforts to pioneer a truly new product are often reported in the press. Recent examples in the durables manufacturing
sector include the electric car and the steam locomotive. In the latter case, a New Jersey firm believes its coal-fueled design can be operated more cheaply than current diesel locomotives and is looking for backing and a site. Efforts to attract this type of venture could pay off not only in direct job creation, but also in retention and expansion of the supplier base. Private-public efforts to package venture capital, identify and improve sites, and market the City's considerable advantages in the durables manufacturing arena might successfully attract this type of regenerative industrial activity.

Forming a Midwestern Coalition for Basic Manufacturing Opportunities

In durables manufacturing, the international situation as well as the budget recomposition addressed in chapter 8 have deeply depressed performance. This has made it difficult for many firms to raise the necessary capital to innovate in both technology and product in order to stay competitive at home and abroad. A midwestern coalition could be formed to articulate the cost and damage done by macroeconomic policies to the region and its major industries.

Within the region, such a coalition could initiate studies to determine the cost to the taxpayers of tax base and job competition which has been emerging around Saturn-type location decisions. It could consider joint marketing of midwestern states to potential locators and it might consider mutual insurance mechanisms such as tax base sharing. The latter, pioneered in the Twin Cities of Minneapolis and St. Paul and their suburbs, has been in effect since the early 1970s. It pools a large portion of industrial and commercial tax base increments. This means that no locality loses out when growth occurs in the region, but receives a share of this pooled tax base, which
forms a growing proportion of total industrial tax base every year. As a result, no community need accept an unwelcome activity to obtain a tax base increment nor compete with neighbors for shopping malls, high tech plants, and industrial facilities.

10.3 Strategies for Southeast Chicago

Place-based actions can be taken in conjunction with these industry-targeted efforts to ensure that the most heavily impacted communities receive the benefits. Our industry analysis suggests that the southeast side remains the preferred spot within the City for producing steel and for many related activities. Our investigation into the area's occupational structure indicates that neither high tech nor services will serve as a sufficient substitute for manufacturing. Furthermore, an effort to revitalize industrial Chicago will have major payoffs for the central business district, the west side manufacturing complex, and many blue collar neighborhoods.

Development Planning for the Southeast Side

Industrial renewal could be facilitated by adopting an overall development strategy for the southeast side in preference to a piecemeal, site-by-site approach. This could identify the major industrial areas, both occupied and vacant, pinpoint major catalytic infrastructure projects (such as new transportation facilities and industrial parks), target certain areas for intensive redevelopment efforts, and anticipate the commercial and neighborhood effects of industrial renewal. The process of crafting such a strategy would surely generate new ideas, debate, and insights, as well as attract potential investor interest.

Promoting Industrial Parks
Southeast Chicago contains at present a significant amount of underutilized industrial land. Our research suggests that industrial renewal could be engendered by creating industrial parks on a common theme. The theme parks would capture two kinds of linkages which most conventional industrial parks do not. They would seek to recapture the agglomeration economies which form the glue of the steel-based industrial complex. These economies include links between suppliers, steel mills, steel-using industries, and distributors such as steel service centers. The parks would also encourage closer proximity of competitors to each other, which has been a powerful synergistic factor in the performance of the lower Lake Michigan steel complex.

Second, the parks would capture the linkages between existing capacity on the southeast side and research, experimentation, and commercialization efforts. If the research labs outlined above were built into industrial parks, they would serve as long-term catalysts for continual industrial regeneration in the area. Similarly, attraction of anchor tenants of a new generation, such as a new minimill or a steam locomotive plant, could spark supplier start-ups in tandem.

Programs for Labor Adaptation

The large pool of unemployed blue collar workers created by southeast side plant closings constitutes a sheer waste of economic resources as well as a formidable social cost in terms of foregone taxes, social insurance costs, and deteriorating health and community safety. Our research shows that approximately one-third of recent job loss is the result of automation and production restructuring. Even if steel and related industries resurge to late 1970 levels, a
A substantial amount of unemployment will remain in the new streamlined mills. While new product innovation might create employment opportunities, there is no guarantee that the number of jobs, nor their specifications, would be sufficient to absorb the currently displaced.

One improvement on existing programs might be the establishment of long-term unemployed workers assistance centers funded through state programs. An example is the Massachusetts program which funds seven such centers around the state (selected by unemployment levels, plant closing incidence, and the number of long-term unemployed) to provide job search assistance, training, job development, counseling and support services. In 1985, the Commonwealth of Massachusetts will devote $2.6 million to these centers, which will reach an estimated 2065 workers.

Another interesting model is a Massachusetts demonstration program where workers, local businesspeople, and local managers directly participate in community-based efforts to develop action plans for generating new employment. The Massachusetts Cooperative Regional Industrial Laboratory (CRIL) involves displaced skilled workers in new product development, alternative ownership, new means of production and attraction of new businesses. As of March 1985, $250,000 had been devoted to the CRIL program, which operates three labs, funded through the federal Job Training Partnership Act. A similar lab could be created to encourage worker entrepreneurs and/or teams of workers, former managers and local businesspeople to meet gaps left by exiting plants or to pioneer new products.
An effort to visit and assist all local business on the southeast side could serve as a complement to industrial monitoring. Some businesses reached will be suppliers to the local steel industry, while others will be serving the neighborhoods whose incomes are heavily shaped by manufacturing activity. In both cases, timely information on potential problems and technical assistance, especially for small businesses, can help them to weather this period of adversity and gear up for an industrial renewal effort. A recent southeast side experiment, the business calling program, has begun this type of activity on an areawide basis and might merit further support.

These three sets of recommendations are suggested by on our research findings and are offered to the Task Force for its consideration. In our view, an aggressive strategy, coordinated among public and private sector actors, could make a great deal of difference to the future of the southeast side and the steel-based industrial complex. Without a concerted effort to respond to the current crisis, which is the product of complex but not inevitable forces, the current decline of both the area and the industry is apt to continue. With such an effort, further losses may be stemmed and new jobs created in a revitalized industrial complex.
Chapter 1

1. In general, more data is available for the larger geographical units. Census tract data, which gives us good information on the population by residence, is only available in decennial years, though the more up-to-date Where Workers Work gives us fine-grained data on employment by workplace. County Business Patterns is good to within two years, but is not consistently available for highly disaggregated industries. Truly up-to-date data is available only on a state basis.

2. The Census Tracts included:

<table>
<thead>
<tr>
<th>Tract</th>
<th>Tract</th>
<th>Tract</th>
</tr>
</thead>
<tbody>
<tr>
<td>4401</td>
<td>4701</td>
<td>5203</td>
</tr>
<tr>
<td>4408</td>
<td>4801</td>
<td>5204</td>
</tr>
<tr>
<td>4502</td>
<td>4802</td>
<td>5205</td>
</tr>
<tr>
<td>4601</td>
<td>4803</td>
<td>5206</td>
</tr>
<tr>
<td>4602</td>
<td>4804</td>
<td>5401</td>
</tr>
<tr>
<td>4603</td>
<td>4805</td>
<td>5501</td>
</tr>
<tr>
<td>4604</td>
<td>5001</td>
<td>5502</td>
</tr>
<tr>
<td>4605</td>
<td>5002</td>
<td></td>
</tr>
<tr>
<td>4606</td>
<td>5003</td>
<td></td>
</tr>
<tr>
<td>4607</td>
<td>5104</td>
<td></td>
</tr>
<tr>
<td>4608</td>
<td>5105</td>
<td></td>
</tr>
<tr>
<td>4609</td>
<td>5201</td>
<td></td>
</tr>
<tr>
<td>4610</td>
<td>5202</td>
<td></td>
</tr>
</tbody>
</table>

3. We have tentatively decided to leave Kankakee County out of the study, although it has two small finishing mills. While the area defined is larger than the City of Chicago proper, it is smaller than AISI's definition of the Chicago district, which includes Nebraska's giant Nucor minimill, North Star Steel in St. Paul, and an Iowa finishing mill. This definition permits us to aggregate data from County Business Patterns and the Census of Manufacturers.

4. In 1980, the Chicago SMSA consisted of the following Illinois counties:

   Cook, DuPage, Kane, Lake, Will and McHenry.

5. See Kijewski, Brosch, and Bulanda, 1972:II:4-7 and the other volumes for an extensive history of these neighborhoods.

6. In this set of numbers, Porter County was eliminated because figures for most of these industries were suppressed in County Business Patterns.

7. Data for the detailed sectors shown in Table 1.2 are not available at below the county level.

9. Although Great Lakes believes that there are issues of breach of contract involved, it does not have the resources to take on a major firm like U.S. Steel. O'Connor notes that there is no such thing as legal aid for small businesses. If there were, it might help to forestall such plant shutdowns.

10. O'Connor suggests that one remedy for this might be a requirement for open bidding on private contracts of this sort.

11. The Dun and Bradstreet data must be used with caution. As Bluestone and Harrison (1982) and others have pointed out, the technique used to chart births and deaths of firms often understates true job loss and overstates births, especially of small businesses. A comparison of D and B data with other sources for the Southeast Side suggests that it has indeed seriously understated job decline in these sectors. The advantage of this data base is that it gives us firm, rather than simply sectoral, data.


13. These findings must be interpreted with caution, since Census procedures are believed to undercount black and hispanic men, especially in communities with high unemployment and poverty.

14. Puttermann, 1985:21; percentages are of those responding to each question.


Chapter 2

1. Lester Thurow, 1980. Others have argued a similar strategy nationally. See, for instance, Lawrence, 1984, and Reich, 1983.

2. The other two thrusts are new business formation and central city revitalization.

3. Steel, heavy equipment, machine tools and industrial machinery, motor vehicles, agriculture, health services, medical technology and communications equipment.

Chapter 3

1. The Economic Scan done by the Federal Reserve Bank for the Commercial Club showed job loss in both types of manufacturing, but consumer goods losses were much heavier (-17000) than for durables (-2600) from 1976-81 (Commercial Club, 1984b).

2. Interindustry analysis charts every purchase and sale at the firm and plant level. It thus accounts for all sales, which the regional and national gross product accounts do not, since they eliminate steel embodied in other products to avoid overcounting of final output. Linkages will change if technology changes substantially. While the literature shows that technical coefficients
are quite stable over long periods of time, there is some reason to doubt their durability during this recent period of intense industrial restructuring.

3. For a lengthier history of Chicago's industrial complex, see Lerner and Markusen, 1985. The history of the corresponding land use, transportation and employment patterns within the City of Chicago are treated in McDonald, 1984.

4. See footnotes to Table 3.5 for an explanation of the computation of this ratio.

5. This category includes computers, in which Minnesota ranks fourth nationally.


7. The identification of key sectors and use of industrial complex analysis to chart linkages in a regional economy have been described in Hewings, 1974, and O'Fallon, 1984.

8. Porter County is not included here because data is not readily available. The county has few industrial establishments except for the huge Burns Harbor steel mill of Bethlehem. Thus only steel portion of primary metals is underestimated by this exclusion.

9. Our selection procedure involved ranking all relevant 4-digit industries on the basis of their employment and establishments (from U.S. Bureau of the Census, County Business Patterns, 1982) for three geographical units (Cook County, Cook/Lake/Porter/DuPage Counties, and Illinois plus Indiana) and on the basis of their national employment growth and steel usage (from U.S. Bureau of the Census, Census of Manufacturers, 1977 and 1982).

10. The Center for Governmental Studies data was purchased from the Regional Science Research Institute, Amherst, Massachusetts. It is similar to that used in the Illinois Forecasting and Simulation, purchased from Regional Economic Models Inc., Amherst, cited in the beginning of this chapter. Both use the 1977 national input-output table, updated from the 1972 survey. Regional disaggregation is achieved by estimating shares of output using state economic and interstate transportation data in a regression analysis. For a conceptual explanation of the estimation technique and a test on two existing state models, see Stevens, Troy, Ehrlich and Bower, 1983. Both Randy Jackson at Northern Illinois University's Center for Governmental Studies and William Denham at the State of Illinois' Department of Energy and Natural Resources were exceptionally helpful in this effort.

11. This is equivalent to the U.S. Department of Commerce, Bureau of Economic Analysis' Chicago BEA region, which is an extended labor market area. In 1985, the Chicago Economic Area includes the following counties:
12. Results of economic impact analysis using the Northern Illinois University's input-output estimates, done by the Center for Governmental Studies, expressly for the City of Chicago.

13. See, for instance, Anderson, 1983; Mazza and Wilkinson, 1980; and McBreen, 1977. For critical reviews of the methodology used in these studies and an effort to interpret the evidence on subcontracting, see Rees, 1982 and Markusen, 1986a.

14. These figures significantly understate true defense demand because they do not include purchases from Department of Energy (e.g. for nuclear warheads), National Aeronautical and Space Administration, National Guard, and several other such agencies, nor do they completely include foreign military sales. They do include the indirect as well as direct impact of DOD demand, since they were derived from an input-output table.

15. See the review in Tri-state Conference on Steel, 1984:7.

16. Markusen, Hall and Glasmeier, 1986. Their definition of high tech is based on the occupation shares of engineers, technicians, and selected scientists in the workforce. For preliminary reports of these results, see Glasmeier, Hall and Markusen, 1984a, 1984b and 1983.

17. A number of studies of selected high tech industries (e.g., robotics, computer software) and their geographical proclivities within the U.S. are summarized in Hall and Markusen, 1985.

Chapter 4

1. Dr. Frank Cassell, a member of the Task Force's Policy Committee and Chair of the working group on the role of steel in the Chicago economy, suggested the typology of steel company strategies used in Section 4.3.

2. Figures on the production of steel at a regional level are not available. However, our interviews suggest that the shipments from the Chicago district displayed in Table 4.2 are a fair estimation of production in the area.

3. For a detailed analysis of the role of Steel Service Centers in the Chicago steel market, see Chapter 7.
4. However, the actual decline of steel use, as opposed to recorded levels of consumption, is overstated, since much steel now enters the U.S. marketplace indirectly, embodied in components and consumer goods. See Chapter 8.

5. Brief discussions of these sectors are also included in Chapters 5 and 7.

6. See Markusen, 1985b, for an account of the relationship between oligopoly and diversification.

7. Japanese firms invested more than $500 million in U.S. steel facilities in 1984 alone, principally in finishing mills. They are drawn by the "enormous depth and potential" of the U.S. market, the fear of renewed import controls, the growth of Japanese auto, truck and tractor products in the U.S., and opportunities for "parking spare cash" (O'Boyle, 1984b).

8. Wage costs per man-hour worked fell from $23.60 in 1982 to $22.50 in 1983 to $21.90 in June of 1984. Base hourly wages fell from $11.41 to $11.10 in the same period (AISI figures). In 1985, as of July, they had risen slightly to $22.50. The cuts are the result of the 1983 contract which instituted a 10% wage cut to be restored gradually by 1986. The issue of steelworker pay is treated at length in Chapter 8.

9. For an extended discussion of this form of displacement, see Massey and Meegan, 1982.

10. This view has been advanced by Frank Cassell in a number of discussions.

Chapter 5

1. Minimills are not distinguished from all blast furnaces and raw steel producers (SIC 3312) by the Census of Manufacturers. However, a sample of 29 minimills plants for which data on employment levels was provided in Institute for Iron and Steel Studies, 1978, reveals that the average number of employees per plant in that year was 654. By simply multiplying this average by the total number of plants reported as operating in 1984 (54), one would estimate that around 35,300 workers are currently employed nationwide in the minimill sector. This estimate is considerably higher than the United Steelworkers estimate of 23,000 in 1984. Repeating this estimating procedure for the year 1976, with a sample of ten plants for which the number of employees was reported, yields a much lower estimate of around 13,000 jobs in the sector for that year. While these estimates must be viewed skeptically, due to the wide diversity in employment levels among individual minimills, it seems reasonable to conclude that there has been at least a moderate increase in aggregate employment in the minimill sector during the last decade.

2. Our rank correlation analysis of the number of mini steel mills and all other steel producing plants for each of the 28 states where minimills are currently operating suggests a low, but statistically significant positive relationship ($r^2 = .37$, significant at $a = .05$). Comparing these results to a similar rank correlation analysis performed by Schmidt and LeHeron, 1976, using data on the location of mini- and other steel mills in 1972, reveals that the correlation is less powerful currently than it was in the earlier period.
(Schmidt and LeHeron's results were as follows: \( r^2 = .43 \), significant at \( \alpha = .05 \)).

3. Clearly, this test is somewhat simplified in that it does not include information regarding output of minimill products by domestic integrated mills for each region. But, as was noted earlier, for three of the four products counted here as "minimill products", it is generally accepted that minimills nationwide account for 75% of all domestically produced goods.

4. Data available for imports by customs district does not account for cross hauling of goods once they have entered the country. This may have more important implications for some regions over others. For instance, industry experts in the Chicago area have indicated that during the winter, most imported steel reaches the Chicago markets through other customs district entry points, since the Great Lakes waterways are frozen.

5. Two additional assumptions have been made. One is that the markets are "closed systems", in that no locally-produced minimill products are exported from the region. Given the general characterization of minimill markets as regional, as reported in the trade literature and in interviews with several steel industry professionals, it seems reasonable to assume that the broadly-defined regions included in this analysis are indeed relatively closed with respect to exports. Second, our test assumes that all minimills in all regions produce only those four products for which import figures are included. A more highly disaggregated profile of product mix by region would be preferable, but is unavailable.

6. Annual data for the years 1973 through 1979 were used in the analysis. More recent data on the regional production levels of minimills is available only for two-year intervals. All figures for apparent minimill production were estimated under the assumption that capacity utilization for minimills is 85% in each year.
with either 1% of sales or $1 million being devoted to R & D, for which data are available. I have included below all figures for integrated steel companies since 1975, when FAB Accounting Standard #2 made rules on reporting R & D expenses consistent. However, there are many puzzling omissions in the data printed in Business Week.

5. The Economic Recovery Tax Act of 1981 led to an investment boom as steelmakers generated capital by selling their investment tax incentives (which they could not use due to immense losses) to other companies. This "safe harbor" leasing was abolished in 1982. As a result, the industry cannot use most of the investment benefits it has gained in recent years (Capital Formation, 1984). Another way investments might be facilitated is through further development of "creative financing" measures used to fund a few recent continuous caster purchases (O'Boyle, 1984c).

6. Even more futuristic ways to make steel -- including the use of plasma systems to melt iron and form steel and electro-chemical refining of iron ore -- have attracted considerable interest over the decades (U.S. OTA, 1980). However, the research completed thus far has been quite disappointing (Long, 1981; Szekely, 1983). The Keyworth Initiative will examine such alternative steel-making technologies, as is the National Science Foundation-sponsored Center for Iron and Steelmaking Research at Carnegie-Mellon University, but pundits expect few breakthroughs here until the twenty-first century (Argonne, 1984; McManus, 1985g).

7. See the remarks of Frank W. Luerssen, president and chief executive officer of Inland Steel, in Chandler, 1983.

8. In Vaccarri, 1982, for example, the development of free-machining stainless steels is related.

9. Several observers and regional studies have recently argued that governments must take a more active role in catalyzing change in American industry (See Chapter 2). Among the most distinguished voices raised to this end is Bela Gold, former director of the research program in industrial economics at Case Western Reserve, who argues that governments must encourage steel-making innovations actively (Gold, et al, 1984).

Chapter 7

1. This study is based on a review of trade publications and literature on the steel industry, on a collection of available data from secondary sources, and on extensive interviews conducted with industry officials on the West Coast, in the Midwest, and with trade association representatives.

2. For instance, in 1983, service centers distributed 60% of domestically produced structural pipe and tubing; in the same year, 75% of imported structural pipe and tubing passed through steel service centers. (Metal Center News, April, 1984).

3. Availability of labor, especially skilled labor, is not an important consideration. The industry is not labor intensive, and the majority of the jobs do not require specialized skills.
4. The Chicago regional market as presented in Figure 7.11 was defined through a series of interviews with steel distributors in the city. Each different type of shading represents the market area of one of these establishments. The black area represents the "home" market area served by both large and small distributors interviewed in the course of the study.

Chapter 8


3. However, it is possible to view cheap labor in third world countries as a constructed advantage as well, given the repressive labor practices engaged in by some of their governments and tolerated by lending nations and international agencies. See Bluestone and Harrison, 1982.

4. The shares of steel job loss accounted for each of these categories have been figured from their individual components, discussed in each section below. These figures represent a splicing together of estimates from quite disparate sources and are an approximation only. They are also drawn from evidence on the period 1979 to 1984 and would vary if longer or shorter periods were in question.

5. In the EEC, 52% of capacity is state-owned ("Can Steel Stem," 1985). In Japan, a government-directed industrial policy performs much the same role (Howell, 1983).

6. Apparent consumption is a residual, since it is impossible to measure this aggregate directly. It is computed by subtracting exports and adding imports to the domestic mills' total shipments annually.

7. See Markusen, 1985a, for an elaboration of these findings.

8. Barnett and Schorsch, 1983: 283 also note that defense industries purchase only a small share of output.


10. Identification of these factors results from interviews with workers in Pittsburgh and Chicago. See also the discussion in DuBois, 1985a, where he analyzes job loss in Indiana mills from each of these and the following causes.

11. Subcontracting in the U.S. currently accounts for about 20% of steel-related employment, whereas in Japan it accounts for about 40% (Merrill Lynch, January 1985:14). The latter level represents the limit to great subcontracting by the domestic steel industry.

12. DuBois (1985a) concluded that job loss in these mills was attributable to the following: subcontracting (21%), speed-up (32%), new equipment (7%), shutdowns (23%) and shifts in mix from labor-intensive products (e.g. plate) to capital-intensive ones (e.g. sheet).
Chapter 9

1. The American Iron and Steel Institute estimates that energy efficiency between 1972 and 1983 in the U.S. steel industry has increased by more than twenty-five percent. The much lower Battelle estimate, however, takes into consideration the changing product mix and the growing use of semi-finished steel, and appears to be more objective ("Energy Use", 1984).

2. See Mueller, 1984:246 for a discussion of this problem. Differences in vertical integration and capacity utilization also affect comparison.

3. Although Phelps did not think that differences in product mix and/or subcontracting arrangements could be contributing in a major way to these differences, it is important to keep in mind that both may be affecting these shifts. Also, the AISI/Paine-Webber figures are more favorable to the domestic industry than previous figures used by Barnett and Schorsch (1983) and Mueller (1984).

4. Some European countries are higher, however -- Italy, France, Germany but not the United Kingdom.

5. The auto industry has been much more closely studied. Yet even here, a recent review by a joint U.S.-Japanese team found that cost differences attributable to wage rates ranged from 25 to 80% and those to hourly productivity differences from 10 to 54% -- "both these ranges are quite large and certainly suggest less consistency than has been assumed" (Cole and Yakashiji, 1984:120).

6. In this area, comparing aggregate productivity and wages is not a very useful exercise because the product mix is so very different. A similar point must be made of minimill productivity.

7. For instance, compared with $12.60 for iron and steel production workers in 1981, hourly earnings were $6.62 in electronic components, $4.77 in rubber and plastic footwear, $4.96 in apparel, $5.52 in textiles (Belous, 1984:13 using BLS data).

8. In the same period, real hourly earnings were rising (in own currency term) in foreign manufacturing at the following rates: Canada (+2.4%), France (+10%), Italy (+6.5), Japan (+55), United Kingdom (+8.3), and West Germany (1.4) (UAW, 1985:4).
Bibliography


Bethlehem Steel Corporation. 1983. Form 10-K.


-339-
Chicago: Federal Reserve Bank.


Have They Fared?" Monthly Labor Review, June: 3-16.


before Special Session on Competitive Materials, Annual Meeting, American
Iron and Steel Institute, New York, 1984.

Location and Rising Energy Prices," Atlantic Economic Journal 5 (March)
49-54.

Technology Industries." Working Paper #407. Institute of Urban and
Regional Development, University of California, Berkeley.

Glasmeier, Amy, Peter Hall and Ann R. Markusen. 1984a. "Can Everyone Have a
Slice of the High-Tech Pie? Metropolitan High-technology Growth in the

Glasmeier, Amy, Peter Hall and Ann R. Markusen. 1984b. "Recent Evidence on
High Technology Industries' Spatial Tendencies: A Preliminary Investi­
gation." In Office of Technology Assessment, U.S. Congress, Technology,
Innovation and Regional Economic Development. Washington, DC: Government
Printing Office.

Technological Progress and Industrial Leadership: The Growth of the U.S.

Crain's Chicago Business, April 29, p.4.

December 25.

February 16.


Inland Steel. 1983b. *Form 10-K*.


Markusen, Ann. 1985c. Interview with former LTV chief economist, April 5.


Markusen, Ann. 1986b. "Neither Ore, Nor Coal Nor Markets: A Policy-Oriented Reconsideration of Steel Sites in the U.S." Regional Studies, forthcoming.


Sanger, E. 1984. "Proving Their Mettle: Steel Service Centers are a Bright Spot in a Dull Industry." Barron's, July 9.


Steel Service Center Institute. 1981. Buyer Influence Awareness Study. Cleveland, SSCI.

Steel Service Center Institute. 1984a. Delphi Survey on Future Trends in the Steel Service Center Industry. Cleveland, SSCI.

Steel Service Center Institute. 1984b. Mills, Service Centers: Geared to Work Together. Seminar on the Role of the Service Center in Metal Distribution. Cleveland, SSCI.

Steel Service Center Institute. 1984c. Total Domestic Shipments to Service Centers. Cleveland, OH: SSCI.


