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ENERGY AND EMPLOYMENT IMPLICATIONS OF FOREIGN TRADE OPPORTUNITIES IN THE NORTHEAST

Pedro Alba, David Blandford and Richard Boisvert

ABSTRACT

In the Northeast, the principal market expansion for its manufactured products is likely to come from outside. Sales to export markets can create jobs and could potentially exacerbate the region's dependence on imported energy. This analysis demonstrates that 26% of the Northeast's manufacturing employment is in sectors which have experienced significant expansion in exports in recent years. For most of the export sectors, the employment contribution is above the average for domestically-oriented industries, and the energy requirement is below the average. By focusing export promotion policies on these sectors, employment objectives need not conflict with energy conservation objectives.

INTRODUCTION

In recent years, the role of international trade in the United States' economy has increased dramatically. Between 1960 and 1979, for example, merchandise exports rose from 3.9% of Gross National Product (GNP) to 7.7% of GNP. Nearly 90% of this increase has occurred since 1970. Imports have expanded even more rapidly, from 2.9% of GNP in 1960 to 8.9% of GNP by 1979. The merchandise trade balance, which was positive throughout the 1960's, has been generally negative during the 1970's (U.S. Department of Commerce, Bureau of Economic Analysis).

An increased dependence on foreign petroleum has contributed to import growth and to the unfavorable trade balance. Imports of non-agricultural products rose by $129.6 billion from 1970 to 1978, including oil imports of $39.4 billion; exports expanded by $77.5 billion. The resulting unfavorable trade balance of $49.4 billion in non-agricultural products was only partially offset by the positive balance in agricultural products of $14.6 billion.

While the efforts of recent Administrations to promote energy independence and reduce the trade deficit have received much publicity, the Carter Administration also took measures to promote exports. Although agricultural exports have grown steadily, a substantial part of future growth must be achieved in manufactured goods because agricultural exports are unlikely to continue their rapid expansion.

Recent studies have demonstrated that because of its industrial structure, the Northeast is in a relatively favorable position to take advantage of expanding export markets in manufactured products (e.g., Blandford, Boisvert and Alba).[1] These foreign trade opportunities may have important implications for employment, particularly in the face of stable or declining domestic markets in a region where population growth is low. On the other hand, the Northeast is highly dependent on imported energy, from both foreign sources and other regions of the country. Perhaps more than any other region, the shortrun possibilities of reducing such dependence are limited. Therefore, the potential employment gains from foreign trade must be balanced carefully against its implications for energy consumption.

This paper identifies sectors in the Northeast, for which national exports have been growing rapidly in recent years. Both the direct and indirect effects on employment and energy use of export expansion in these sectors are assessed using an interindustry model of the Northeast's economy. The results are used to examine the desirability of promoting exports of manufactured products produced in the region.

METHODOLOGY

The first step in exploring the trade-off between employment and energy in the Northeast is to identify manufacturing industries which are experiencing or could take advantage of expansion in export markets. One measure might be a time series of disaggregated data on regional net exports, preferably at the 4-digit SIC level. However, trade statistics at the regional level indicate past participation in foreign markets but they do not necessarily reflect current or future trade potential. Simply because a particular industry in a region has not been active in international markets does not imply that the potential for doing so does not exist. In order to reflect this currently unexploited potential, trade data at the national level are used to identify manufacturing industries that could potentially take advantage of expanding export markets. Implicit in this procedure is the assumption that firms in these industries, regardless of their location, have an approximately equal opportunity to participate in these expanding international markets.

A one-year "snapshot" of trade figures cannot distinguish among those products whose trade has grown in the past and then stabilized, and those that are expanding at the present time. Trends in the values of imports and exports over time are equally misleading, in the sense that they are sensitive to general inflation and do not account for changes in the relative prices of individual commodities. To circumvent somewhat this valuation problem relative trade performance is evaluated by comparing changes in the value of exports and imports between two recent years, 1972 and 1976, to changes in the value of domestic shipments (Blandford and Boisvert).[2] This

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The joint authors are graduate research assistant and assistant and associate professors, respectively, Department of Agricultural Economics, Cornell University.

[1] For the purpose of this paper, the Northeast is defined as New York, New Jersey, Massachusetts, New Hampshire, Rhode Island, Maine, Vermont and Connecticut.

is accomplished in two steps.

First, (I/S) [(E/S)] is defined as the 1976 ratio of imports [exports] to domestic shipments divided by the 1972 ratio of imports [exports] to domestic shipments.[3] Relative trade performance is then defined as: positive if (I/S) $\leq$ 1 and (E/S) > 1, the ratios indicate an expansion of net exports (or decrease in net imports); negative if (I/S > 1 and (E/S) $\leq$ 1, the ratios indicate a decrease in net exports (or increase in net imports); and positive^{+}[negative^{+}] if (I/S) and (E/S) are both greater than 1 or less than 1 and (E/S) > (I/S)[(E/S) < (I/S)]. These cases are ambiguous because exports and imports as a fraction of shipments have both changed in the same direction. The changes have opposite effects on net trade but because relative prices of products within the sector may have changed (the valuation problem), the ratio provides only a preliminary indication of the net position.

These calculations are made for all 4-digit manufacturing industries. While it would be desirable to maintain this level of disaggregation to formulate industry specific recommendations, such disaggregation could not be maintained in this brief paper. To facilitate discussion and the interindustry analysis, industries are combined into 29 sector aggregates on the basis of product homogeneity and trade performance similarity. These are distributed across three major categories (Table 1).[4] The category of primary interest in this paper includes sectors for which there has been major export expansion. Table 1 indicates the trade performance of the sector aggregates, the Northeast's employment in each aggregate, and the distribution of employment in terms of the trade performance of component 4-digit industries.

Total manufacturing employment in the region, as reported in County Business Patterns, was just over 3.2 million in 1975. Approximately 26% of this total is contained in sectors for which there was major export expansion nationally from 1972 to 1976. An additional 9% was in those parts of the apparel and footwear industry which have been faced with increased import competition for a number of years. The balance of manufacturing employment, 65% of the total, is in industries which contribute significantly to the Northeast's economy but have been relatively less affected by international trade.

The "export sectors" encompass a wide range of industries. Several of the sectors are in high technology fields (e.g., scientific instruments, electrical machinery and transportation equipment). Employment in these three sectors alone accounts for 42% of the total for the 9 export sectors. Another 31% is accounted for by machinery. Several smaller sectors such as lumber and book publishing are also included. Because of the necessary aggregation, 6 of the export sectors are classified as ambiguous export performance sectors. However, in 4 of these sectors, over 60 percent of the employment is in 4-digit industries whose export performance at the national level have been unambiguously positive. Blandford, Boisvert and Alba identify the major 4-digit industries in these aggregates which have demonstrated particularly strong export growth during the mid 1970's. Were this methodology used to develop industry specific policy implications, the interindustry analysis described below could easily be disaggregated to accomodate these refinements.

The employment figures given in Table 1 provide an indication of the significance of foreign trade for manufacturing in the region. However, in order to explore the employment and energy implications of export expansion, both the direct and indirect effects of increased export demand are determined through an interindustry model of the region.[5] This model contains 40 sectors (see Appendix) which were delineated to highlight the importance of international trade, as well as energy use within the Northeast. The complete model is given in Alba and is developed using a nonsurvey technique described in Boisvert and Bills. This technique estimates technical coefficients (direct input requirements) for each

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2 Data for 1976 were used primarily because it was the most recent year for which data were available at the time this study was initiated. The year 1972 was chosen for two reasons. First, because trade in manufacturing goods has only recently become important to the U.S. economy, it is argued that recent trends in exports and imports are the most appropriate indicator of market potential. Second, the intervening years (i.e. 1973-1975) are not included because of the economic recession which is reflected in these data.

3 Throughout the analysis care has been taken to insure a maximum degree of comparability between trade data and data on the value of domestic shipments. The Census Bureau, in reporting its trade data, makes every effort to minimize distortions between export data and SIC product codes. These data are reported on a commodity basis rather than on an industry basis. Data from the Census of Manufacturers on domestic shipments are reported both on a commodity basis as well as an industry basis. For purposes of computing relative trade performance, shipments on a commodity basis were compared with trade data organized in a similar fashion. However, in the interindustry analysis below, it was necessary to estimate employment and energy impacts by industry. Thus, these impacts reflect the input requirements of an industry's entire output, including production of relatively small amounts of secondary products. Because of the relatively minor importance of secondary products, the effects on the final results are likely to be small.

4 Because trade performance may differ across the 4-digit industries, some 2-digit manufacturing sectors have been disaggregated to isolate the component 4-digit industries with similar trade performance (Appendix).

5 See Yan, or Chenery and Clark for a discussion of interindustry models.

Table 1. Classification of Employment in Northeast Manufacturing by Trade Performance

Trade Grouping (Sector Name)[a]	Employment 1975	% of Sector Employment Classified Under Following Categories For Component 4-Digit SIC Industries					Δ(I/S) 1976/72[b]	Δ(E/S) 1976/72[c]	Relative Trade Performance[d]
		X	X+	M+	M	NT[e]			
Major Export Expansion[f]	819,714								
1 LUMBR X	27,374	46.3	49.3	n	-	4.4	0.88	1.60	positive
2 BOOK PUB	27,995	70.5	-	-	-	29.5	0.85	1.26	positive
3 GL + ST X	37,284	64.9	35.1	-	-	-	0.83	1.43	positive
4 FABMTL X	71,649	66.9	33.1	-	-	-	1.06	1.59	positive$^+$
5 MACH X	254,034	62.9	24.9	10.6	1.7	-	1.06	1.52	positive$^+$
6 ELECT X	95,908	58.8	41.2	-	-	-	1.09	1.83	positive$^+$
7 TRANS X	166,787	73.4	26.5	-	-	0.1	1.02	1.47	positive$^+$
8 INSTR X	80,636	64.9	35.1	-	-	-	1.35	1.47	positive$^+$
9 MISCM X	58,047	37.3	59.8	-	-	2.8	1.05	1.75	positive$^+$
Major Import Competition[g]	301,354								
10 APPAR IP	256,707	3.9	15.7	1.3	31.4	47.7	1.60	NA	negative
11 FOOTWEAR	44,647	-	14.4	-	77.1	8.6	1.48	NA	negative
Other	2,093,583								
12 FOOD + TAB	176,774	11.4	2.8	0.1	4.8	80.9	NA	NA	NT
13 TEX MILL	116,917	22.8	6.5	-	8.8	61.9	NA	NA	NT
14 APPAR OT	40,074	-	25.1	11.9	-	63.1	NA	NA	NT
15 LUMO + FUR	65,123	1.9	3.2	-	2.9	92.0	NA	NA	NT
16 PAPER	129,202	24.8	9.5	8.2	-	57.5	1.14	1.35	positive$^+$
17 PUB OT	227,942	-	-	-	0	100.0	NA	NA	NT
18 CHEMICAL	216,449	16.6	5.8	11.8	2.3	63.4	1.07	1.29	positive$^+$
19 REFINERY	6,372	-	-	0.3	77.4	22.3	1.12	0.82	negative
20 PET + RU + P	85,938	25.5	7.5	-	13.7	53.2	1.28	1.48	positive$^+$
21 LEATH OT	40,730	6.5	80.9	9.3	-	3.3	1.25	1.71	positive$^+$
22 GL + ST OT	49,609	-	10.1	-	-	89.1	NA	NA	NT
23 PRI MTL	132,871	19.3	8.3	5.2	3.1	64.1	1.05	1.30	positive$^+$
24 FABMTL OT	167,940	3.0	3.6	16.8	0.2	76.4	NA	NA	NT
25 MACH OT	125,859	3.2	12.2	37.3	1.3	46.0	1.45	1.38	negative$^+$
26 ELEC OT	274,256	8.3	-	78.3	2.4	11.0	2.20	1.71	negative$^+$
27 TRANS OT	27,202	0.8	-	-	-	99.2	NA	NA	NT
28 INSTR OT	125,086	-	-	83.4	-	16.6	1.33	1.28	negative$^+$
29 MISCM OT	78,417	-	35.7	35.9	13.6	14.8	1.43	1.10	negative$^+$
TOTAL	3,214,651								

Source: U.S. Department of Commerce, 1972a,b, 1976a,b, 1977a-i.

NA = not applicable because of negligible trade; n = less than 0.1%

[a] See appendix for component 2-digit SIC sectors and sector definitions.

[b] The 1976 ratio of national imports to domestic shipments divided by the 1972 ratio of imports to domestic shipments.

[c] The 1976 ratio of national exports to domestic shipments divided by the 1972 ratio of exports to domestic shipments.

[d] Relative trade performance is: positive if $\Delta(I/S) \leq 1$ and $\Delta(E/S) > 1$, the ratios indicate an expansion of net exports (decrease in net imports); negative if $\Delta(I/S) > 1$ and $\Delta(E/S) < 1$, the ratios indicate a decrease in net exports (increase in net imports); and positive$^+$[negative$^+$] if $\Delta(I/S)$ and $\Delta(E/S)$ are both > 1 or < 1 and $\Delta(E/S) > \Delta(I/S)$[$\Delta(E/S) < \Delta(I/S)$]. These cases are ambiguous because exports and imports as a fraction of shipments are moving in the same direction. These changes have opposite effects on net exports, but because of the valuation problem, one can only infer whether the relative shift is favorable [unfavorable]. NT denotes negligible trade, i.e., neither imports nor exports in 1972 or 1976 exceeded 5% of domestic shipments.

[e] As defined in footnote d, X and M equal positive export and import performance, respectively, X+ and M+ are the corresponding ambiguous cases.

[f] Sectors of major export expansion have positive or positive$^+$ trade performance and at least 30% of their employment in 4-digit SIC industries classified as X.

[g] Major import competition sectors have negative trade performance and a least 30% of their employin 4-digit SIC industries classified as M.

sector as a weighted average of the national technical coefficients in component 4-digit industries. The weights are derived from Northeast employment in each component industry. Regional gross output per employee for each sector is assumed to be the same as that for the nation. Total output is calculated by multiplying this figure by total employment in the sector. Explicit consideration was given to adjusting coefficients to reflect both competitive and non-competitive imports. In addition to other intermediate input requirements, this procedure provides direct estimates of energy requirements in dollar terms. These requirements were converted to physical energy units (BTU's) using information provided by Simpson and Smith.[6]

The data requirements for constructing this regional interindustry model are extensive, involving interindustry transactions and energy requirements for nearly 400 industries. The most recent year for which complete information on interindustry transactions is available is 1967.

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6 Developing regional interindustry tables from national tables through non-survey techniques implies many strict assumptions. The technique used in this study overcomes some of the common difficulties in such an attempt and therefore improves the reliability of the regional table in comparison to tables developed through other non-survey techniques (see Alba for a complete discussion). In the Northeast in particular, production processes may differ significantly from national processes especially in the relatively old and inefficient traditional heavy industries. This implies that the estimated average energy and employment requirements in these old line industries should be viewed with care. However, the majority of the export sectors are relatively new high-technology industries. Therefore, input requirements may be more homogeneous across the U.S. and the estimates more reliable.

Table 2. Estimated Employment and Energy Requirements in Northeast Manufacturing Per Million Dollars of Final Demand (1967 Dollars)

Manufacturing Sector[a]	Employment				Energy[b]					
	Direct[c]		Total[d]		Direct[c]		Total[d]		Imported[e]	
	Employees	Rank[f]	Employees	Rank[f]	BBTU	Rank[g]	BBTU	Rank[g]	Percent	Rank[g]
Export Expansion										
1 LUMBR X	38	2	72	4	17.7	8	66.3	8	45.1	2
2 BOOK PUB	25	8	73	3	1.4	1	32.4	1	55.9	9
3 GL + ST X	37	3	68	6	34.9	9	110.9	9	40.8	1
4 FABMTL X	30	6	63	8	7.2	6	53.3	7	51.1	4
5 MACH X	30	6	68	6	5.3	3	44.9	3	52.8	8
6 ELECT X	32	5	69	5	6.3	4	50.2	6	50.3	3
7 TRANS X	20	9	59	9	9.2	7	45.0	4	51.8	6
8 INSTR X	35	4	75	2	6.3	4	36.3	2	52.3	7
9 MISCM X	43	1	82	1	3.3	2	49.8	5	51.6	5
Average	28	NA	67	NA	5.3	NA	46.4	NA	51.9	NA
Import Competition										
Average	60	NA	107	NA	1.6	NA	32.5	NA	50.6	NA
Other										
Average	28	NA	65	NA	21.5	NA	83.6	NA	48.3	NA

Source: Calculated from the interindustry model for the Northeast given in Alba.

[a] Definition of sectors included is given in the appendix. Average for export-related is weighted by relative increase in exports 1972-76. Other averages are weighted by regional total gross output.

[b] Requirements measured in billion British Thermal Units (BBTU).

[c] Direct requirement per million dollars of output (1967 dollars).

[d] Direct plus indirect requirement per million dollars of final demand (1967 dollars).

[e] From all sources.

[f] Sector with the highest employment requirement ranked first.

[g] Sector with lowest energy requirement (import proportion) ranked first.

NA = not applicable.

Although clearly dated, when viewed in the light of recent energy price increases, the framework provides a preliminary perspective on the employment and energy trade-off in the Northeast.[7]

RESULTS

The estimated employment and energy inputs needed to satisfy a one million dollar expansion in final demand for Northeast manufacturing sectors is given in Table 2. The requirements for the major export sectors are delineated separately, while averages are given for the two other categories identified in Table 1 above. Total input requirements as well as the direct requirements are reported.[8] Indirect requirements can be calculated by simple subtraction. To evaluate the employment/energy trade-off in various manufacturing sectors, one must examine the relative employment and energy intensities. Table 2 illustrates the importance of considering the total requirements per unit of final demand rather than just direct requirements.

The absolute magnitude of the total employment generated and the total energy requirements associated with export expansion can be significantly higher than the direct effects alone would indicate. This is particularly true for energy. For example, the average total energy requirement for the export expansion sectors is nearly 9 times the direct requirement. In the extreme case of Book Publishing, the total requirement is more than 23 times the direct requirement; a figure which is particularly significant since it is estimated that 56 percent of this energy is imported by the region. In the case of employment, the absolute differences are less dramatic. On average, the ratio of total to direct employment is 2.4; there are 28 jobs directly and 67 jobs in total generated per million dollars of exports.

In Table 2, the export sectors are ranked from high to low in terms of their employment contribution and from low to high in terms of energy requirements. These rankings differ for direct and total effects, particularly in the case of employment. For example, from an employment perspective, Book Publishing's direct contribution is relatively low, ranking 8th among the 9 export expansion sectors. In terms of its total contribution, it ranks number 3.

While these rankings provide some perspective on the employment/energy trade-off within the export sectors, Figure 1 provides greater insight into this relationship for all manufacturing sectors in the region. Depicted in this figure are total employment and energy requirements per million dollars of final demand. The average energy use and employment across all domestically oriented industries (the "other" category of Table 1) are indicated to provide a point of reference. Because the emphasis of the paper is on international trade, these averages facilitate a comparison of energy use and employment in export sectors with those sectors which primarily serve domestic markets. Two of the quadrants defined by this reference system are of particular interest. All sectors falling in quadrant A use less energy and generate more employment per million dollars of final demand than the average for all domestically-oriented sectors. All sectors falling in quadrant D use more energy and generate less employment than the average for all domestically-oriented sectors. On the basis of employment and energy conservation objectives in the Northeast, the expansion of final demand for the products of industries in quadrant A is clearly preferable to expansion of sectors in D. This essentially implies an objective function defined in terms of satisficing levels of both employment and energy criteria.[9]

As Figure 1 indicates, all the export sectors with the exception of Stone, Glass and Clay Products, Fabricated Metal Products and Transportation Equipment lie in quadrant A. No export sector falls in quadrant D. On this basis, one could conclude that in the Northeast, sectors for which export growth has been significant are relatively employment/energy efficient. Efforts to promote overseas sales for the products of these sectors are likely to be consistent with energy conservation objectives.

CONCLUSIONS

In a region such as the Northeast, in which population growth has slowed, the principal market expansion for its manufactured products is likely to come from outside. Recent increases in exports nationally suggest that overseas markets will prove to be a major source of such expansion. Sales to export markets can create jobs in the region but at the same time could potentially exacerbate its dependence on imported energy.

The analysis in this paper demonstrates that 26% of the Northeast's manufacturing employment is in sectors which have experienced significant

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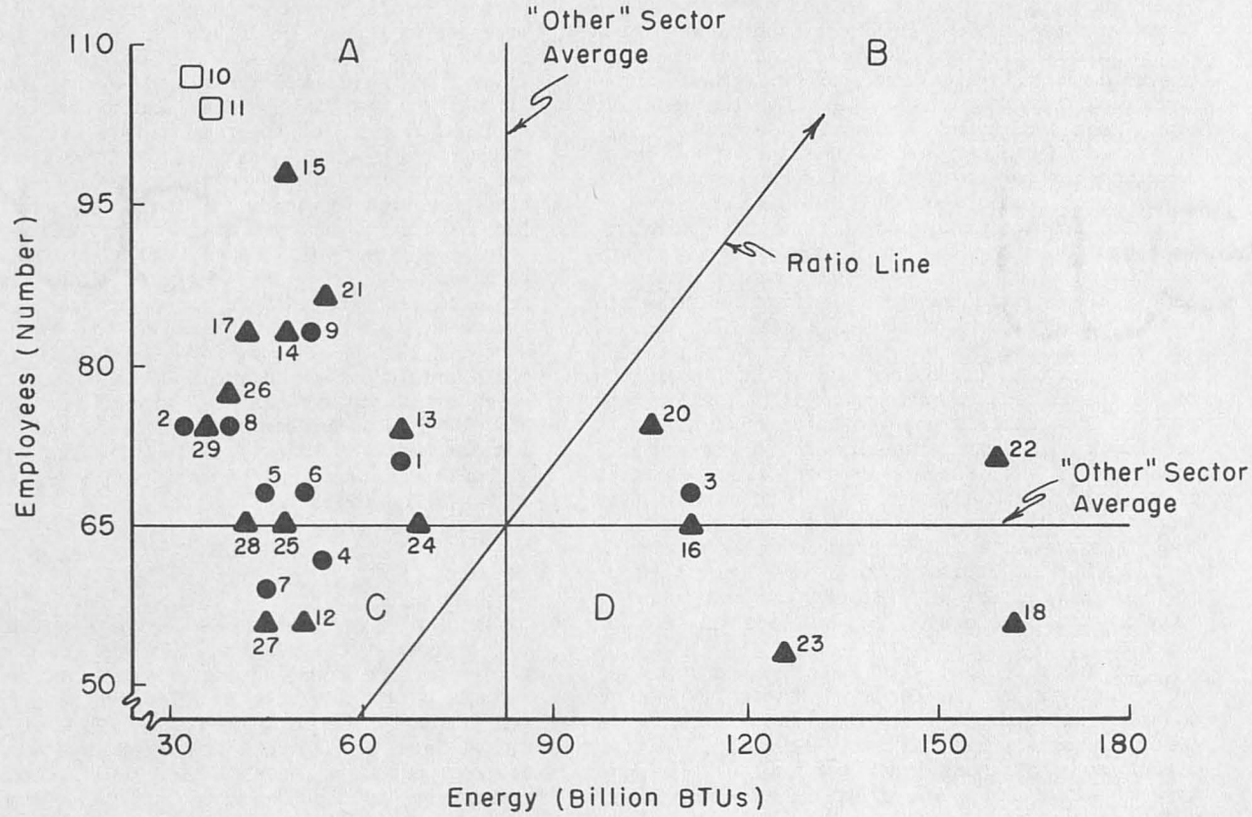
7 Because of the relative changes in energy prices and input substitution that have occurred during the past 10 years, the energy impacts in terms of BTU's could be overestimated.

8 The total requirements matrix and employment and energy requirements are calculated by using a computer program developed by Boisvert and Lassiter.

9 The desirability of final demand expansion for sectors in quadrants B and C is less clear. In B, sectors outperform the average in terms of employment but use more energy. The reverse is the case in C. In these two quadrants, sectors lying to the left of the ratio line indicated have a higher "employment/energy efficiency" than the average. Sectors lying to the right of the ratio line have a lower efficiency than the average. Despite their apparent efficiency, sectors lying to the left of the ratio line in quadrants B and C meet only one of the satisficing criteria. Thus additional information on the importance attached to energy versus employment objectives would be needed to determine their desirability.

FIGURE 1. TOTAL EMPLOYMENT AND ENERGY IN NORTHEAST MANUFACTURING SECTORS PER MILLION DOLLARS OF FINAL DEMAND (1967 Dollars)



- Major export expansion sector
- Major import competition sector
- Other
- 21 Sector number, corresponding names given in Table 1

Ratio Line = Line whose slope is given by average employees/energy for other sectors (0.8)

expansion in exports in recent years. Evaluated in terms of a million dollar expansion in final demand, these sectors on average generate 67 jobs (directly and indirectly) compared to 65 jobs for domestically-oriented sectors. This difference is relatively small. However, in terms of energy use, the same increase in demand requires an average 46 billion BTU's in the export sectors, just over one-half the corresponding average energy requirement for domestically-oriented sectors. For 6 of the export sectors, the employment contribution is above the average for domestically-oriented industries, and simultaneously the energy requirement is below the average.

The results have important policy implications at both the regional and national levels. By focusing national and regional export promotion policies on these sectors, regional employment objectives need not conflict with the objective of reducing the rate of growth in energy use. Because the sectors are already well established in the Northeast, export promotion programs directed towards specific industries within them could have a relatively rapid payoff. Such industries have previously been identified in Blandford, Boisvert and Alba. Furthermore, given the nation's dependence on imported petroleum, the expansion of exports from energy efficient sectors contributes favorably to both sides of the balance of payments ledger. Expanded export earnings help to pay for purchases of foreign goods; a reduction in the rate of growth in energy use helps to ease the demand for imported petroleum.

National policy makers can also use the results as a guide for energy allocation in times of severe energy supply curtailment. By allocating limited energy supplies to sectors with high energy employment/efficiencies, the adverse impact of curtailment on the domestic economy can be reduced. In addition to the 6 export related sectors, 7 domestically-oriented sectors, whose total employment (energy use) is above (below) the regional average, should be given priority in terms of emergency energy allocations. Because the calculated efficiencies reflect total, and not just direct effects, emergency allocations must also be made to industries supplying indirect inputs to the "efficient" sectors. The interindustry table contains the information needed to guide such allocations or could serve as the basis for a constrained optimization model in which employment (or some other regional policy objective) could be maximized subject to an energy constraint.

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Appendix. Endogenous Processing Sectors for the Northeast Interindustry Model

Sector Name[a]	Sector Description	Related SIC[b] Code (1972)
AGRIC	Agriculture, Agricultural Services, Forestry and Fishery	01, 02, 07-09
COAL	Coal Mining	11,12
CRUDES	Oil and Gas Extraction	13
MINING OT	Other Mining	10, 14
CONST	Construction	15, 17
FOOD + TAB	Food and Kindred Products, Tobacco Manufacturing	20, 21
TEX MILL	Textile Mill Products	22
APPAR IP	Apparel, import competition	23
APPAR OT	Apparel, other	23
LUMBR X	Lumber, and Wood Products, export expansion	24
LUMO + FUR	Other Lumber Products and Furniture	24,25
PAPER	Paper and Allied Products	26
BOOK PUB	Book Publishing	27
PUB OT	Publishing, other	27
CHEMICAL	Chemicals and Allied Products	28
REFINERY	Petroleum Refining	29
PET + RU + P	Other Petroleum and Coal Products, Rubber and Misc. Plastic Products	29, 30
FOOTWEAR	Footwear, Except Rubber	31
LEATH OT	Other Leather Products	31
GL + ST X	Stone, Glass and Clay Products, export expansion	32
GL + ST OT	Other Stone, Glass and Clay Products	32
PRI MTL	Primary Metal Industries	33
FABMTL X	Fabricated Metal Products, export expansion	34
FABMTL OT	Other Fabricated Metal Products	34
MACH X	Machinery, Except Electrical, export expansion	35
MACH OT	Other Non-electrical Machinery	35
ELECT X	Electric and Electronic Equipment, export expansion	36
ELECT OT	Other Electric and Electronic Equipment	36
TRANS X	Transportation Equipment, export expansion	37
TRANS OT	Other Transportation Equipment	37
INSTR X	Instruments and Related Products, export expansion	38
INSTR OT	Other Instruments and Related Products	38
MISCM X	Miscellaneous Manufacturing Industries, export expansion	39
MISCM OT	Other Miscellaneous Manufacturing Industries	39
ELEC UT	Electric Services	49
GAS UT	Gas Production and Distribution	49
TRSR + PU	Transportation and Other Public Utilities	40-42, 44-49
TRADE	Wholesale and Retail Trade	50-59
FINANCE	Finance, Insurance and Real Estate	60-67
SERVICES	Services	70, 72, 73, 75, 76, 78-84, 86, 88, 89

[a] "X" refers to "positive" trade performance by most 4-digit industries included in the sector. Book Publishing is also an industry with a positive export performance. "IP" refers to negative trade performance by the majority of the 4-digit industries included in the sector. The Footwear sector is also an import competition industry. Perfect classification into positive or negative trade performance was not possible because, while the trade methodology was applied to data organized through the 1972 version of the SIC, the input-output table was constructed from the 1967 U.S. table classified through "BEA" sectors which are either 1967 4-digit SIC industries or aggregates of such industries.

[b] To the extent possible, sectors are defined to be consistent with the SIC 2-digit code. Where a given code is listed for more than one sector, only a part of the component 4-digit industries is included in each. See Alba for details on the sectoring plan.