CHAPTER III

TRANSPORT, LOCATION OF INDUSTRY AND THE TRADE STRUCTURE OF AMERICA
This chapter is an attempt to study the role of transport - particularly of the fall in transport costs and the changes in the modes of transportation over time - in influencing the location of industry and thereby the trade structure of America.

I

In this section, we will try to distinguish several ways in which we suppose that transport affected the location of industry and the trade structure of America. Before analysing in detail, we might first briefly mention each of these ways:

1. Fall in transport costs meant a relocation of population, income and economic activity (agricultural as well as industrial) towards the interior of America.

2. Fall in transport costs implied a fall in distribution costs of products, and so even industries located on the coast could serve a wider market.

3. The procurement costs of raw materials also fell and this factor can also be supposed to have influenced the trade structure.

4. Apart from its influence through fall in transport costs, transport directly affected industrial growth and trade structure through the direct linkage effects of different modes of transport. The railroads at the peak of their
expansion, to some extent, stimulated the growth of the iron and steel industry, coal mining and various chemical industries — all of which are the by-products of this coal-iron complex. Similarly, the growth of automobile trans-
portation directly stimulated not only the petroleum industry but also the petro-chemical industries.

Transport development through its first effect, i.e., a relocation of population, income and economic activity towards the interior created a large internal market in America and through its second influence, i.e., fall in distribution costs, made it relatively cheaper to serve this market from domestic locations. This effect operated all the more vigorously because of the fact that in America internal transport costs fell more rapidly than ocean transport costs. This growth of a large domestic market — which could also be served cheaply from domes-
tic locations — meant that the output of manufactures could be produced on larger and larger scales. Economies of scale were realized in manufacturing and hence costs of production fell rapidly.

Further, in the era when railroads became the chief mode of transportation in the economy, not only was a domestic market created and unified but the technological characteristics of railroad transportation tended to make this market a spatially concentrated one. With railroad transportation, line haul costs are very small and fixed terminal costs very important. So the unit costs per ton-mile decline very rapidly with the total volume of traffic, with distance
travelled per load and with the size of each consignment. Cheapest transport can therefore be provided if production is concentrated at a very few key points, thus providing large-volume, long-distance traffic. In particular, junction points of the railroad network or trans-shipment points where a break of transportation between rail and water transport takes place would have unique advantages transport-wise; and given the need for concentration of traffic imposed by the railroad technology there would be very few such nodal points in the railroad era. Hence economic activity, population and demand tend to concentrate to an unprecedented degree at these few nodes. Every round of concentration brings about a cumulative concentration of industry through further intensifying the growth of the local market, the advantages of economies of scale and of urbanisation etc.

This concentrated growth of market and industry in the railroad age further increased the economies of scale advantages that accrue from the existence of a large domestic market.

We might here briefly note down some observations on the way in which the large size of the domestic market affected American industrial growth. A large domestic market, as we have mentioned above, meant realisation of economies of scale and high profits. Hence both investments as well as innovations were stimulated in the economy. Further, apart from being a large market, this market was a homogeneous
market - as a result of the existence of a large group of middle ranged income earners - and so standardized mass production became possible instead of diversified production for small local markets. This factor strongly favoured the use of machinery, from an early date, in America. Thus a large homogeneous market enabled America to surmount the disadvantages created by a shortage of labour-specially skilled labour.

Not only was there a fall in distribution costs and a growth in the domestic market but also a fall in procurement costs of raw materials which permitted expansion of scale and realization of economies of scale to go on. While expansion was not constrained by labour scarcity, the problem that might have arisen of feeding labour was also eliminated by transport developments in the new and fertile lands of the interior so that food resources became available in abundance and at cheap rates.

Thus we see that the development of transport played a crucial role in the attraction of industry to the interior of America. This attraction of industry to the interior gave further stimulus to locate new industry, and so this entire process became cumulative in nature, with the shift of industry more and more towards the interior the special advantages that accrued to the local producers, from the fact that internal transport costs fell more rapidly than the ocean transport costs, went on increasing. In this way, an
intensified growth of manufacturing in the economy followed. Hence this entire process of shift in the location of industry kept feeding on itself and not until the frontier was reached was this process retarded to some extent by a scarcity of natural resources.

II

It is through the several ways mentioned in the above analysis that transport can be supposed to have had an important bearing on the location of industry and thereby the trade structure of America. We will, in the following sections, try to establish our argument by citing the following sets of empirical evidence:

1. It was the transport-oriented industries that accounted for the change in the trade structure of America.
2. The fall in transport costs and changes in the modes of transportation coincided in time with some qualitative shifts in the trade structure.
3. The changes in trade structure were but one part of the general process of relocation of industry towards the interior of America.

III

In this section, we will show that the transport-oriented industries accounted for major changes in the trade structure of America.
From the analysis developed in the first section of this chapter it is immediately implied that the transport-oriented industries should have had great importance in the changes in trade structure. The group of transport-oriented industries comprises the heavy industries like iron and steel, metallurgy, certain kinds of machinery industries like the agricultural implements industry, heavy chemicals etc. Let us show first why transport costs are of great relevance in the location of each of these industries. The iron and steel industry is a consumer of coal, iron-ore and limestone. Out of these, coal is a bulky material required in very large amounts per unit of finished metal and hence costly to transport; it is also localized in occurrence. The freight costs on the finished products of this industry are also generally high. Taking into consideration both these factors, it is the minimization of procurement and distribution costs that rules the locational decisions of this industry. Till the middle of the nineteenth century, the pull of coking coal was the strongest influence on the location of this industry because large quantities of coal were required to produce a ton of pig iron and so costs of transporting coal, otherwise, would have been very high. Towards the end of the century, however, these requirements of coking coal to smelt the iron were greatly reduced and hence markets began exerting greater influence on locational decisions.1 This was specially so because, as we

have mentioned above, freight charges on iron and steel products are generally high and sometimes even higher than on the raw materials though the weight of the finished product is much less than that of the raw materials. Moreover, in an industrialized economy, with its increasing amount of obsolete iron and steel structures and discarded products, scrap becomes available for consumption by the iron and steel industry. The percentage of total iron obtained from scrap has steadily increased. To the extent that the source of the purchased scrap is geographically concentrated at the market, the mounting consumption of scrap has steadily increased the pull of the market on the location of the industry.

The location of metal products industries is also primarily governed by transport cost considerations because these industries turn the output of primary industries (like iron and steel) into finished products and for all these transport costs are an important cost item. So location near the iron and steel industries offers great advantages in terms of transport costs to the metal products industries.

The inputs as well as the products of the agricultural machinery industry are heavy and bulky. So nearness to

2. Finished steel products account for 52.2 per cent of total transport costs of steel products, whereas coal accounts for 25.7 per cent and iron-ore for 21.1 per cent. See Allen Rodgers, "Industrial Inertia - A Major Factor In The Location Of The Steel Industry In The United States", The Geographical Review (New York, N.Y.), vol. 42 no. 1, January 1952, p. 68, Table IX.

both the raw material sources as well as markets is important primarily to save on transport costs.

Likewise, the heavy chemicals, because they sell at low prices relative to weight, cannot bear the costs of long transportation. This consideration of transport costs dictates their manufacture near the raw material sources or markets.

We will now prove that these transport-oriented industries in fact accounted for much of the change in trade structure. This is evident from the fact that in the American trade structure there has been a steady shift in the export structure of manufactures - away from products of animal or vegetable origin and towards those of mineral origin. Among those of mineral origin the trend has been away from commodities closely tied to the production of raw materials, such as petroleum products, to metal products, including machinery and vehicles; and within the metal products group the shift has been to more complex machinery and vehicles. For example, in 1879-81 manufactured petroleum products and articles of animal or vegetable origin (mainly textiles, wool and tobacco products) represented more than 65 per cent of American exports of manufactures, while all metal products accounted for only 21 per cent. But the leading commodities of 1879 contributed very little to the great surge in manufactured exports that followed; of the increase between 1879-81 and 1910-13, petroleum products, which were over
40 per cent of the total at the beginning, contributed only 13 per cent; textiles, which had been 16 per cent, added only 8. Metal products were responsible for 73 per cent of the gain, and doubled their share. By the end of World War II, petroleum products had fallen to 8 per cent of the total whereas metal products had soared to over 60 per cent. 4

It is thus clear that the products of the transport-oriented industries were responsible for much of the change in the trade structure of America over the period of our study. In the first section, we developed our main argument of this chapter: the development of transport through its various effects directly attracted industry towards the interior in a cumulative process and thereby affected the trade structure of America. If this is correct, then the greatest impact on the trade structure should have been exerted by the transport-oriented industries. The fact that they in fact did so, as is shown in the present section, is the first evidence that establishes our argument.

IV

We will now spell out in detail our second set of empirical evidence - that changes in the modes of transportation were intimately related with qualitative shifts in the

trade structure of America the former appear indeed to have determined a large number of major shifts in the latter.

These shifts can be expected to take place because any transport development that reduces overland transport costs must influence the nature of economic activity in the economy and thereby the trade structure also. In the case of America all this is evident in the following way:

Before the development of overland transportation in the American economy, rivers were the only means of transport. Since these rivers in America flow mainly in the North-South direction, the Appalachian Mountains put a great hindrance to East-West trade in this era. The American economy, therefore, because of high costs of overland transportation was an outward looking economy. Her major activities - shipping, carrying trade, cotton trade - were all export-oriented. The nature of economic activity, however, changed with the construction of canals and then with the change in the mode of transport from water to railroads and trucks. These transport developments led to rapid fall in overland transport costs and created a large domestic market in the economy. So the American economy became more inward looking rather than remaining simply an outward looking economy.

This change in the nature of economic activity that came about with the fall in transport costs and changes in the modes of transport, influenced the trade structure also.
We will first briefly show this for the period before the Civil War.

During the period 1840-1860, overland transport costs fell rapidly because of the growth of an extensive system of canals and some development of railroads. Fall in transport costs created a domestic market and this provided increasing opportunities for domestic industrialization. Manufactures, therefore, increased their share in total commodity output. The trade structure also experienced to some extent a qualitative shift. The finished manufactures, for example, increased their share in the total exports from 5.66 per cent in 1821 to 17.73 per cent in 1861-65 whereas in total imports their share declined from 56.86 per cent to 40.62 per cent over the same period. However, it is to be noted that the list of manufactured goods exports was dominated by cotton manufactures.


The period from the Civil War to the First World War is marked by the shift in the mode of transportation towards the railroads so that either through railroad transport or a combination of rail and water transport became possible on all routes. During this period, the vast interior of America was rapidly settled, and an extensive exploitation of rich mineral and other natural resources of the economy was undertaken. Not only was a vast domestic market created but also natural resources became available in elastic supply and at low transport costs. A combination of these factors facilitated a shift in the composition of output towards the products of iron and steel and other related industries. By the years 1897 and 1898, American production costs both in iron and steel had declined substantially and were lower in comparison to British and other European producers - according to a report in 1897, Bessemer pig could be made in America under the most favourable circumstances for £2.50 or £3 a ton less than in Great Britain, and that the difference in the cost of producing steel was equally in favour of the United States.9 According to another report in 1898, a ton of iron could be made for less than £9.50 at Pittsburgh, while it cost to produce about £12 in Great Britain, nearly £13 in Germany, a shade more than this in Belgium, and considerably higher - approaching £14 - in France.10 Two factors seem to

10. Ibid.
account for this difference in costs:

(a) The major factor was that while the cost of raw materials was rising in Europe, it was falling in America as a result of cheap transport and the rich content of natural resources. Coke cost about one-third in Pittsburgh of what it cost in Great Britain, and the average content of iron in American ores was estimated to be 50 per cent as compared with 38 per cent in British domestic ores.11 Because of cheap transport, the cost of carriage of Lake Superior ores in America was not materially greater than that of Spanish ores imported into Wales.12

(b) A further factor favouring low costs of production in America may be taken to be the fact that opportunities for the realization of economies of scale were being created more rapidly in America than in other countries. Demand for steel, for example, rose faster in America than in Britain or even Germany since the 1920s. As Peter Temin points out, production for home consumption may be taken as a good measure both of consumption and of demand in protectionist countries. This type of production increased by a factor of 23 in the United States between 1920 and 1913, and by a factor of 19 in Germany whereas it increased 15 times in these years outside the US and Germany.13

11. Ibid., pp. 92, 117.
12. Ibid., p. 92.
The rapid growth of iron and steel and related industries achieved in an era when overland transport costs were falling coincided with a qualitative shift in the trade structure of America. Cotton manufactures, saw mill products and other wood manufactures were the leading items of manufactured goods exports in the period before 1880. But thereafter they no longer remained so. During the 1880s, machinery exports rose rapidly and outstripped exports of cotton manufactures. All this is clear from the following table:

**TABLE 1**

<table>
<thead>
<tr>
<th>Yearly Average</th>
<th>Machinery</th>
<th>All Class Manufactures</th>
</tr>
</thead>
<tbody>
<tr>
<td>1881-90</td>
<td>15,607</td>
<td>12,568</td>
</tr>
<tr>
<td>1891-1900</td>
<td>36,068</td>
<td>19,994</td>
</tr>
<tr>
<td>1901-10</td>
<td>95,971</td>
<td>35,287</td>
</tr>
</tbody>
</table>


With the turn of the century, exports of iron and steel mill products also rose rapidly and achieved higher levels than the exports of cotton manufactures. From an export level of $11,840,000 during 1891-1900, the value of exports of these products rose to $43,528,000 during 1901-10 and steadily maintained this lead over cotton manufactures in the following decades. 14

The shift in the pattern of trade was achieved over the period when the railroad mileage in the economy was expanding (i.e., till the year 1920). This is evident from Table 2 given below.

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<table>
<thead>
<tr>
<th>Yearly average</th>
<th>Railroad mileage (Road owned)</th>
<th>Iron and steel mill products</th>
<th>Machinery all classes</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>% of exports of finished manufactures</td>
<td>% of total exports</td>
<td>% of exports of finished manufactures</td>
</tr>
<tr>
<td>1871-75</td>
<td>65,229.6</td>
<td>1.4</td>
<td>0.2</td>
</tr>
<tr>
<td>1876-80</td>
<td>82,072.0</td>
<td>1.2</td>
<td>0.1</td>
</tr>
<tr>
<td>1881-85</td>
<td>122,399.0</td>
<td>1.1</td>
<td>0.1</td>
</tr>
<tr>
<td>1886-90</td>
<td>151,806.6</td>
<td>1.6</td>
<td>0.2</td>
</tr>
<tr>
<td>1891-95</td>
<td>175,162.8</td>
<td>2.3</td>
<td>0.3</td>
</tr>
<tr>
<td>1896-1899</td>
<td>197,445.4</td>
<td>8.4</td>
<td>1.7</td>
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<tr>
<td>1901-05</td>
<td>207,930.2</td>
<td>6.5</td>
<td>2.2</td>
</tr>
<tr>
<td>1906-10</td>
<td>232,631.8</td>
<td>11.4</td>
<td>3.1</td>
</tr>
<tr>
<td>1911-15</td>
<td>249,355.4</td>
<td>12.4</td>
<td>4.1</td>
</tr>
<tr>
<td>1916-20</td>
<td>253,437.8</td>
<td>19.3**</td>
<td>7.6**</td>
</tr>
<tr>
<td>1921-25</td>
<td>255,273.0</td>
<td>10.6</td>
<td>3.8</td>
</tr>
</tbody>
</table>

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* Upto 1911-15 year ending with June 30 and from 1916-20 with December 31.

** For period July 1, 1916 to December 31, 1920

** Sources: **


The above table shows the extension of railroad mileage and the increase in the share of iron and steel mill products, and machinery in the exports of finished manufactures as well as in total exports.

We will now show that a further qualitative shift in the trade structure of America resulted from the relative increase in the importance of a new mode of transport in the post World War I period - namely truck and automobile transportation.

This shift can be expected to take place because the two modes of transport - the railroads, and automobiles and trucks - give stimulus to two different set of industries. In the automobile age, the coal-iron complex is not the dominant complex and so we must expect the growth of a new set of industries. In America, this was reflected in the fact that with the growth of these new modes of transport, petroleum and natural gas instead of coal rose to prominence. In 1929, coal provided over 60 per cent of the energy used in the United States; petroleum and natural gas provided only about 33 per cent. By 1954, the proportions had been reversed, with petroleum and natural gas accounting for over 67 per cent and coal for only 23 per cent. The petroleum refining industry as well as the petro-chemical industries, as a result, achieved

rapid progress. In addition, many of the rapidly growing chemical industries were pulled to the areas rich in these mineral resources, since many chemical products use oil and natural gas as their raw materials (though it must be admitted that the locational pull of oil and natural gas is not very strong). Thus with the advent of the automobile age, oil and natural gas surplus regions were favoured by rapid industrial growth - of a type different from that existing in the age of railroads.

All this accounted for a shift in the trade structure, to some extent, during this period. We can cite three types of changes in the trade structure that were all related to the growth of automobile transport in the economy:

(a) Rapid growth in the demand for oil by automobiles and also by the chemical industries put an accelerated pressure on the domestic reserves of petroleum. The result of this was a rapid growth in the imports of petroleum, and America finally shifted to a position of net importer of petroleum. The average annual net exports of petroleum declined from 27.84 per cent of output in 1900-04 to about 4.64 per cent of output in 1940-44. Since then a position of net imports has been reached - net imports were about 0.86 per cent

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of output in 1946-49 and about 10.9 per cent of output in 1950. 17

(b) The stimulus provided to the growth of the automobile industry itself resulted in growth in the export of automobiles. Table 3 shows that as the number of automobiles used has increased over time, the importance of automobiles in exports has also increased.

<table>
<thead>
<tr>
<th>Yearly average Registrations a</th>
<th>Exports b (including engines and parts) Percent of total exports of finished manufactures (based on dollar values of exports)</th>
</tr>
</thead>
<tbody>
<tr>
<td>1906-10</td>
<td>340,928.4</td>
</tr>
<tr>
<td>1911-15</td>
<td>1,341,422.0</td>
</tr>
<tr>
<td>1916-20</td>
<td>5,262,192.8</td>
</tr>
<tr>
<td>1921-25</td>
<td>15,677,372.8</td>
</tr>
<tr>
<td>1926-30</td>
<td>21,685,623.0</td>
</tr>
<tr>
<td>1931-35</td>
<td>21,685,623.0</td>
</tr>
<tr>
<td>1936-40</td>
<td>26,715,922.0</td>
</tr>
<tr>
<td>1941-45</td>
<td>26,303,237.0</td>
</tr>
<tr>
<td>1946-50</td>
<td>33,336,304.4</td>
</tr>
</tbody>
</table>

* For period July 1, 1916, to December 31, 1920.

Sources:


17. Percentages calculated from data given in Neal Potter and Francis T. Christy, Jr., Trends in Natural Resources Commodities: Statistics of Prices, Output, Consumption, Foreign

contd...
(c) The growth of chemical industries in the economy has meant that America’s dependence on imports of light chemicals has been reduced. Further, the share of semi-manufactured chemicals in total imports of semi-manufactures declined from about 24 per cent in 1913 to 15.3 per cent in 1929. The export side was marked by the rise of a new class of exports — exports of manufactured chemicals. They accounted for 2.8 per cent of the total exports of finished manufactures in 1913, 3.3 per cent in 1923 and 2.6 per cent in 1929.

In this section, we will show that changes in the trade structure were part of a process of relocation of industry towards the interior of America. Just as throughout the period, there took place a substitution of imports of manufactures from abroad by domestic production of manufactures, similarly there tended to be a substitution of manufactures produced in inland markets in place of manufactures produced on the coast.

(f, n. 17 from pre-page)


19. Percentages calculated from data given in Lipsey, n. 9, p. 171, Table 1.—10.

With every fall in transport costs and change in the mode of transportation, this process of industrial relocation is clearly noticed. The relocation of industry towards the interior is evident even when river transport was cheapened because of the advent of the steam-boat, and overland transport costs reduced by an extensive development of canals in the interior. The growth of various processing industries in the interior and the location of a concentrated iron industry based on mineral fuel in Eastern Pennsylvania is an evidence of this. However, we will concentrate on the period when along with the development of canals rapid railroad development took place in the interior.

The major relocations of industry that took place were mostly of the transport-oriented industries as the analysis developed in the first section of this chapter suggests. Also this evidence supplements the empirical evidence of the analysis given in Section III - that the transport-oriented industries accounted for much of the change in the trade structure.

Further, in this era of railroad transport, as is to be expected, most of the industrial relocation and concentration of industries took place at the nodes of the transport network.

The first example of industrial relocation that we can refer to is that of industrial growth at Pittsburgh. Pittsburgh, rich in bituminous coal deposits, has a natural nodality because it is located at the area where the Allegheny River from the North and the Mononghela River from the South unite. So the
coke of the Connelsville district could be cheaply transported along the Mononghela River. Once Pittsburgh was connected with the East through the development of transport, the area mainly because of its nearness to fuel supplies (so that transport costs of coke were low) attracted the iron and steel industry. The location of this industry thus shifted from the Eastern Pennsylvania to the West. As the local ore deposits of the area tended towards exhaustion, growth of demand encouraged the exploitation of new deposits in Michigan and Minnesota areas. Availability of these rich resources at low transport costs gave Pittsburgh an advantage in its nearness to fuel supplies, and so the area became a major iron and steel producing region.  

Apart from Pittsburgh, the nodes of this transport network or the areas which were the conjunction points of the trade in iron ore and coal were favoured as new locational centres of iron and steel industry. Their main advantages were two-fold: Firstly, low backhaul rates were offered in coal shipments from Pittsburgh to some of these areas on the rail cars that carried iron ore towards it and which would go


21. Ibid., pp. 235-38; see also Isard, E., I., p. 213; for a detailed description about these areas see Donald J. Bogue and Calvin L. Beale, Economic Areas of the United States (New York, N.Y., 1961), pp. 851, 852, 778, 932.
empty, otherwise, on the return journey. Also as new coal
fields beyond Pittsburgh were developed, some of the new areas
derived advantages from being near these new sources of fuel
supplies. Secondly, existence of nodes meant that they were the
centres of a concentrated market. Since great economies in
fuel consumption were achieved in the production of iron and
steel in the later years of the nineteenth century, the markets
at the nodes attracted iron and steel industries.

The new locational centres that emerged were Buffalo,
Cleveland, Chicago, St. Louis, Detroit, Duluth, Gary, Hammond
and Indiana Harbour, and the state of Alabama in the South.

Further, with the development of iron and steel
industries at Pittsburgh and at other nodes of the transport
network, the growth of metal based industries, which are a part
of the iron and steel complex and are also transport-oriented
in nature, was also favoured at these areas.

Moreover, as agricultural production, as a result of
fall in transport costs, was rapidly pushed towards the
interior, specifically towards Chicago, the area became a
centre of another transport-oriented industry - the agricultural
implements industry.

This process of relocation of industry towards the
interior is further evident once the relative importance of
truck transportation increased in the economy. However, with
this new mode of transport a finer and more diffused pattern
of location of industry was encouraged in contrast to a more or
less concentrated pattern of industrial growth (mainly at the
nodes) in the railroad age. The most important reason for this has been the fact that with truck transportation there is a relative decline in the costs of short hauls and of small lots as compared to long hauls and of large shipments. Also it is possible to have more frequent stops than in the case of railroads. Thus the advantages of locating at the major terminals or at the nodes are reduced. Small units can function economically in terms of advantages of transport services. Even if production is concentrated at one place it becomes economical to establish assembly plants near the markets so that the costs of distribution of the finished products are kept low. These costs might otherwise become too high and offset the savings in production costs that result from concentrated growth.

These factors have been instrumental in bringing about a tendency towards decentralization of industries in the interior, in the age of truck transportation. The most important example is that of the automobile industry. Although this is a highly concentrated industry with almost three-quarters of its employment in three states—Michigan, Ohio and Indiana—even in this industry which benefits most from agglomeration, growing markets have attracted the automobile assembly plants in order to keep down transport and assembly costs. In this respect, California, Kansas, Texas and also Massachusetts have made important gains. 22

The incentive to save costs of freight from the Midwest has also led to the shift of branch assembly plants of agricultural machinery and tractors out of Illinois and Wisconsin to areas closer to regional markets.\(^{23}\)

Even steel production has developed near the markets of Texas and some areas in the West. However, the major changes in the location of steel industry have taken place within the Manufacturing Belt.\(^{24}\)

All these manufactures at new locations have been able to withstand competition from the Midwestern locational centres mainly because of the fact that with truck transportation there is an advantage in short overland hauls over long overland hauls so that transport costs rise rather than fall with distance.

From the above, it is clear that with every fall in transport costs and change in the mode of transportation, location of industry shifted towards the interior of America. To prove that the changes in trade structure were part of this process of relocation of industry we need to show that as the location of industry shifted there was a simultaneous decline in the ratio of imports of manufactures to domestic output of manufactures. Table 4 shows the regional distribution of the output of manufactures (from which the shift in the location of industry can be noticed), and the ratio of imports of manufactures to the domestic output of manufactures:

\(^{23}\) Ibid.

\(^{24}\) Ibid., p. 451.
# Table 4

## Regional Distribution of the Output of Manufactures, and the Ratio of Imports of Finished Manufactures and Semi-Manufactures to Total Output of Manufactures

<table>
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</tr>
</thead>
<tbody>
<tr>
<td>New England</td>
<td>23.9</td>
<td>23.2</td>
<td>17.4</td>
<td>15.6</td>
<td>14.4</td>
<td>13.9</td>
<td>13.0</td>
<td>12.1</td>
<td>10.8</td>
<td>10.7</td>
<td>10.2</td>
<td>9.8</td>
<td>9.1</td>
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<td>Middle Atlantic</td>
<td>39.0</td>
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<td>37.4</td>
<td>36.8</td>
<td>35.8</td>
<td>34.9</td>
<td>34.7</td>
<td>34.0</td>
<td>33.3</td>
<td>32.7</td>
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<td>East North Central</td>
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<td>24.7</td>
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</table>

**Sources:**


b. Percentages calculated from data about:

1. Total output of manufactures given in source (a);
From the table it is clear that as the location of industry shifted towards the interior, over the period 1870-1950, the ratio of imports of finished manufactures to the total output as well as the ratio of imports of finished manufactures plus semi-manufactures to the total output of manufactures declined. Hence changes in the trade structure can be viewed as a part of the process of relocation of industry induced by the fall in transport costs and change in the mode of transportation in America.

CONCLUSION

The three sets of evidence cited above clearly establish our main argument of this chapter: the development of transport - particularly the fall in transport costs and the changes in the modes of transportation - played a key role in the location of industry and therefore the trade structure of America.