The area selected for this research includes five western Indiana counties located in the lower Wabash Valley (Figure 1). American settlement began in that area in 1811, and a system of towns soon emerged in which merchants were actively engaged in the river trade to New Orleans. The profits from that trade were used in part to develop a complex of pioneer industries that processed agricultural and forest products and produced the containers and flatboats required to ship the goods.

Beginning in 1850 with the arrival of the railroads, the local economic environment changed substantially. For the first time the area manufacturing industries were exposed to both the problems and opportunities of low cost transportation to the north and east. As a result, the research area was linked with the other industrial areas of the Northeast. The purpose of this research was to determine whether or not selected impacts of the mid-
nineteenth century industrial transition, which occurred in the larger Northeastern industrial centers, were replicated at the small city and town level in the research area.

The Industrial Transition

By the mid-nineteenth century, several major developments began to have an impact on the economy of the United States. One involved the shift from water to rail transportation. Between 1850 and 1860, an integrated rail network was established north of the Ohio and east of the Mississippi Rivers (Rostow 1990; Taaffe and Gauthier 1973; Taylor and Neu 1956; Ward 1971). In that decade, the national railroad mileage increased from about 9,000 to 30,000 miles (Clark 1939; Harper 1982; McKelvey 1973; Stover 1961). Where access to the railroads developed, overland transportation became relatively inexpensive and the importance of the water routes declined. By 1860 the railroads were a major location factor for industry in the Northeast (Coyle et al. 1982; Clark 1939; Higgs 1969; McKelvey 1963; Teaford 1993).

A second critical development involved the shift from a merchant to an industrial economy (Holbrook 1947; McKelvey 1973; Pred 1966; Still 1941, 1948; Walsh 1982). Until about 1850, merchants dominated not only the purchase and sale of goods, but also banking, transportation, warehousing, mining, and manufacturing in the United States (Taylor and Neu 1956). After 1860, large, specialized industrial establishments as well as the corporation were common (Davis and North 1971; Meyer 1883; Miller 1979; Taaffe 1967; Taaffe and Gauthier 1973; Walsh 1972). During the post-1860 economy, the specialized industrial ‘businessman’ rather than the merchant dominated manufacturing.

The transitions from water to rail transportation and from a merchant to an industrial economy were addressed in the development models of Meinig (1972), Muller (1976), Rostow (1990), Taaffe et al., (1963), and Taaffe and Gauthier (1973). Each recognized the importance of improved transportation to both industrial development and the related spatial integration of the economy. Further, Berry et al., (1987) viewed the emergence of the modern industrial enterprise as a necessary step in the integration of large scale, mass production with mass distribution during the ‘second wave’ of the industrial revolution (1830-1880). The basic economic transition that resulted is referred to here simply as the ‘industrial transition’.

After 1860, that transition changed the antebellum set of regional industrial systems that had developed across the manufacturing belt into a set of integrated regions (Meyer 1983, 1990). The shift from intraregional to interregional and national markets was initiated by the increased efficiency and lower costs of the emerging rail system. It was supported by both the economies of scale and locational economies as large factories were located where costs were low. The regional systems developed specializations (Meyer 1983, 1990; Page and Walker 1991) that enhanced their integration at the national level. These changes were a ‘driving force’ in the American economy between 1860 and 1920 (Meyer 1990).

Other crucial changes supported the industrial transition. The demand for manufactured products both increased and diversified, and improved technology led to increased productivity.
Labor became more specialized and efficient, and massive immigration provided the needed additional pool of both skilled and unskilled labor (Teaford 1993). In addition, by 1860 the national rail and telegraph systems (Meyer 1990) facilitated the dissemination of investment capital, information, and new technologies. The nation was clearly experiencing an unprecedented period of rapid manufacturing expansion as it progressed through its industrial revolution.

Midwestern manufacturing developed on a path distinct from that of other regional economies in the manufacturing belt (Page and Walker 1991; Meyer 1990). Its pre-rail industrialization was initially based on the mass settlement of the land and the utilization of local resources.

Pre-transition processing in the area included saw and planing mills, flour milling, distilling, brewing, meat packing, and tanning (Page and Walker 1991; McGregor 1992). An infrastructure of foundries, machine shops, and non-electrical machinery manufactures also needed metal services as well as basic products such as boilers, plows, and stoves (Meyer 1990). In addition, furniture manufacture and containers were common wooden products.

The Wabash River in Western Indiana was navigable to Terre Haute (Figure 2) by shallow draft steamboat, and its larger tributaries by flatboat and keelboat. The pioneer industrial complexes were the primary basis of the early development and growth of the river towns and cities. While area industry was initially based on water power, the large coal deposits in western Indiana facilitated an early change to steam powered facilities.

When rail transportation developed, it became possible for new types of industry to operate at a competitive advantage in the Midwest. The old resource based industries continued to be profitable, but new primary metal product, fabricated metal product, non-electrical machinery, transportation equipment, and instrument industries expanded rapidly in the post-rail period and became regional specializations (Meyer 1983, 1990; Page and Walker 1991; Teaford 1993).

The Midwestern urban system expanded with the post-rail growth of industry. In it, the factory towns and small cities were linked into a ‘Midwestern territorial production complex’ (Page and Walker 1991). More specifically, by 1880, Terre Haute and the towns in the research area functioned as part of a regional industrial system that extended over most of central Indiana (Meyer 1990). In that system, Indianapolis was the dominant metropolis. It served as the financial, transportation, wholesale and warehouse center for the hinterland cities (Terre Haute in the research area). And, Terre Haute presumably had a similar role with its nearby towns.

While the mid- and late-Nineteenth Century (1840-1890) industrial development of many large cities in the United States has been considered in some detail (e.g. Mayer and Wade 1969; Still 1948; Wade 1959), the impacts of the industrial transition in the far more numerous small cities and towns and their role in the process of regional development have been neglected (Mayer
Accordingly, an analysis of the industrial transition at the small city-town level of the urban hierarchy was undertaken in this research.

The Data Base

A detailed record of the industrial development over the period spanning the industrial transition (1840-1890) was necessary to support the analysis of each community considered (Figure 2). Small city and town historical data bases of the type required for this research are not widely available.

The published Census manufacturing statistics of the period proved to be inadequate for making a thorough analysis of local industrial growth in the communities selected for analysis. The data for 1840 were ‘meager and rather inaccurate,’ and the county data provided in 1850 included employment and value of product statistics by industry, but not establishment data, which were added in 1860 (Walsh 1972, 221). The reporting of county data by specific industries was apparently complete in the 1860 Census, but that did not continue in 1870 and 1880. The ‘other’ industry category appeared in those years, as it did for the city statistics reported in 1890.

In the 1870, 1880, and 1890 Censuses, the Vigo County/Terre Haute percentages of the total reported under other industry were 39.9, 16.1, and 13.6 for establishments, 43.3, 34.8, and 40.6 for employees, and 12.7, 34.2, and 53.0 for product values. Even though Terre Haute dominated Vigo County, and the county statistics could have been used to approximate the city’s development, the changes in the 1840 to 1890 coverage and the gaps generated by the use of the other category in county and city statistics from 1870 to 1890 made them inadequate for a detailed analysis of the city’s development.

In addition, no Census statistics were published on the manufacturing industries in the research area towns. The county summaries each included the data from multiple communities, and it was not possible to characterize the development of individual towns from the Census data.

Instead, the data from an intensive survey of pre-1920 manufacturing in a five county area of western Indiana (Figure 1) were used in this analysis (McGregor, 1987). National Park Service funds, granted by the Division of Historic Preservation and Archaeology, Indiana Department of Natural Resources, supported the survey. In it, local industrial development was documented as completely as possible from the published historical sources, unpublished materials located in the area libraries, the surviving public tax records, and intensive field work in the area communities.

In total over 1,500 historic (pre-1920) industrial sites were located in the five county survey area. The size of these sites, the companies which operated on them, their dates of operation, and the products produced were defined for each one. The survey results provided a unique data base on area manufacturing for the 1810-1920 period in which both the types of data collected and the areas considered were consistent for the 1840-1890 period of interest. Although the survey was developed as comprehensively as possible, the documentation of industrial development at the community level did vary. The communities selected for analysis were those for which the data best documented their development over the periods preceding and following the local arrival of the railroad.

Analysis of the small city of Terre Haute, the dominant area center, was an essential aspect of the research. Fortunately, the city’s industrial development, partly defined by a long series of city directories, is well documented.

The information on the development of the towns selected for analysis (Clinton, Eugene-Cayuga, Brazil, and Middlebury-Clay City) was also substantial. In addition, they differed sufficiently in size and development history (1840-1890) to provide a test of how consistent the selected transition impacts were at the town level.

In Eugene-Cayuga and Middlebury-Clay City, the railroads bypassed the early towns and new centers were established nearby along the lines. Each pair of towns was analyzed as a single community, since in both cases the early communities declined rapidly and most industrial activity and their populations soon shifted to the growing new towns along the railroads.

The Historical Economic Context

The development of the river trade to New Orleans ended the economic isolation of western Indiana in the early 1800s. Local
merchants engaged in the triangular trade then typical of the West (Midwest). Area products were shipped downriver by way of the Wabash, Ohio, and Mississippi Rivers to New Orleans and sold. The proceeds were then used to purchase goods in the East, which were brought back to western Indiana for sale. The Ohio River was a critical east-west water link in that trade (Western Journal 1850).

By 1830, area merchants had become involved in the processing of local goods in the towns located along the streams and as well at some rural stream sites (McGregor 1992). Small industrial complexes, in which either flatboat yards or pork packing served as the leading industry, were characteristic of the river towns.

The first railroad in western Indiana was established in 1850 (Meyer 1948), and by 1860 the railroads operating in the area were linked to the developing northeastern network. In the 1850s, the total Indiana track increased from 228 to 2163 miles (950 %), and the Ohio-Indiana-Illinois mileage increased eightfold (Holbrook 1947; Stover 1961, 1978). By 1870, very few western Indiana areas lacked effective rail service (Ward 1971).

In the region, post-1860 trade initially shifted from the river pattern to rail connections with Indianapolis and then with Chicago (Abbott 1981; Conzen 1975, 1977). Through the connections of those centers into the expanding northeastern rail network, western Indiana was linked to the Northeast (Abbott 1987). Individual western Indiana communities should, therefore, have begun to experience changes characteristic of the industrial transition soon after the local arrival of the railroad.

Hypotheses

The hypotheses selected for analysis of the impacts of the industrial transition at the small city and town level have their logical basis in comparative cost, market potential, circular and cumulative causation, and urban threshold (central place) concepts. Anticipated and actual profits are assumed to have been the basis of the attraction to the area’s manufacturing establishments.

Certainly, as a component of the Indianapolis ‘regional industrial system’ (Meyer 1990), the research area shared in many of the fundamental changes impacting the competitive position of the wider region. The new access to rail transportation and a shift to large specialized establishments were certainly fundamental. But, the changes also included the mass immigration of skilled labor into the Midwest (Page and Walker, 1991; Teaford 1993), the spread of advanced machine technology into the region (Meyer 1983), the rising disposable incomes (Page and Walker 1991; Teaford 1993), the established ‘agro-industrialization’ infrastructure (Page and Walker 1991), and the abundance of Midwestern coal (Teaford 1993). Each one contributed to the research area’s evolving comparative industrial advantages in the post-rail period.

The three hypotheses concerning the impacts of the post-rail, industrial transition in the area communities selected for analysis included:

1. Accelerated post-rail growth in the number of manufacturing establishments,
2. Increased post-rail industrial diversification, and,
3. Expanded industrial specializations.

The first hypothesis, that of accelerated growth in the number of manufacturing establishments, followed directly from the introduction of railroad transportation. The more direct routes, more rapid service, and lower transportation costs produced a ‘time-space convergence’ (Janelle 1968) of areas and points on the network. This, along with the interdiction of the river trade during the Civil War, resulted in a shift away from the north-south river commerce to a rail oriented east-west pattern (Stover 1961; Taaffe 1967; Teaford 1993; Ward 1971). The new access to diverse material sources outside the research area as well as to the large eastern markets should have provided a stimulus to both industrial and population growth in communities on the rail network (Clark 1939; Harper 1982; Kale and Lonsdale 1979; Meyer 1983, 1990), and a nearly insuperable problem for those permanently bypassed.

The process of circular and cumulative change (Meyer 1990; Myrdal 1957; Pred 1966; Taaffe 1973), as it relates to the concept of the urban threshold, should also have supported industrial growth at the community level. As local population and industrial growth accelerated in response to reduced material and marketing costs as well as increased external market potential, the local markets for manufactured goods and services would also have
expanded. Additional industries could then have succeeded that previously had required a larger local market threshold than the community and its service area had provided. Further, the growth in industry would have created new opportunities for local industrial linkages, and the larger local labor force opportunities for larger scale establishments. In short, each new establishment would have added to the local locational advantages and supported a continuation of the process.

The second hypothesis, that of industrial diversification, followed from the above. Larger local markets and labor forces, new linkage opportunities, affordable access to new materials, and the opening of the northeastern market to western Indiana establishments would have changed the operating costs and market potential (the comparative advantage) of the area communities (Meyer 1983; Muller 1976; Teaford 1993). New types of industry should have been able to operate profitably in the research area, and some should have been attracted to the area communities.

An expansion of the community industrial specializations, the third hypothesis, should also have occurred. The greater post-rail access of the area communities to the northeastern economy, combined with the evolving shift to industrial (versus merchant) operations, would have created opportunities for new types of large, specialized establishments oriented to serving the northeastern market. As a result, new types of community industrial specializations based on the post-rail advantages should have developed (Meyer 1983, 1990; Muller 1976).

While some of the pre-rail establishments that dominated area communities in the pioneer period would have found the new economic conditions difficult (Walsh 1972, 1982), the focus of many on processing bulky agricultural and forest materials should have provided a continuing locational advantage for them. Thus, the expansion of industrial specializations should have involved a mix of the traditional types of area industries and a variety of new types typically developed in response to the new post-rail opportunities (Meyer 1983).

### Development and Character of the Five Research Area Communities

Among the five communities, Terre Haute, Clinton, and Eugene-Cayuga were initially pioneer river towns. In each one, multiple components of the early pioneer industrial complex developed.

Terre Haute’s population totalled 4,051 by 1850 (the 1840 Census reported only county populations), and increased to 30,217 by 1890. Throughout the 1840-1890 period of analysis, it was the dominant, rapidly growing urban center of the western Indiana research area.

Rail service was extended to Terre Haute in 1850 (the Terre Haute and Richmond Railroad), concurrent with the extension of the Wabash and Erie Canal to the community, and a decade after the arrival of the National Road (Figure 2). The canal service, which ended there in 1860, was a limited factor in local industrial development. The National Road did offer an alternative to rail transportation, but lacked the connectivity, speed, and low costs of the rail system. The river trade continued to serve as part of the community transportation system until the route was closed during the Civil War.

Clinton grew from a population of 321 to 1,365 between 1850 and 1890. The wartime disruption of the river traffic, and the lack of rail service until it was established in 1869 (by the Chicago and Eastern Illinois Railroad), were obvious problems for its industrial development. Yet, Clinton remained a viable local center and continued to increase in population.

In Eugene, the third river town, population declined from 478 in 1850 to 347 in 1870 (the last census figures provided). In 1871 the Chicago and Eastern Illinois Railroad bypassed the community. Then in 1882 the Frankfort and State Line Railroad was routed three miles away from Eugene. Incorporation of Cayuga along the railroad occurred in that year. The surviving Eugene flour mill was quickly moved to the new town, where other industry was soon attracted. Although neither population was reported in the 1890 Census, local growth by then was concentrated in Cayuga, and Eugene continued its decline.

Brazil developed later than the river towns. While a small population was attracted to the Brazil site before 1850, because of some initial industrial activity there along the National Road, the town was not incorporated until the arrival of the Terre Haute
and Richmond Railroad in 1850. It grew from a population of 84 in 1850 to 5,908 in 1890.

Middlebury, established in 1836, was a small settlement that also lacked river transportation. The Terre Haute and Southeastern Railroad was planned and built in 1873, but funds were not sufficient to complete it to Middlebury. Clay City was then incorporated at the railhead (a little over a mile north of Middlebury), where population and industry were soon concentrated. While Census data were not reported for Middlebury, Clay City had 1,004 inhabitants by 1890.

The Use of Establishment Data

The need for consistent data on the five communities selected for analysis led to the use of the establishment data from the historic industrial survey of the area rather than the Census data. While additional measures of industrial activity (such as employment and product values) would have been useful, those statistics on the communities were not available for the four towns and were not consistent for Terre Haute in the 1840-1890 Censuses.

The research hypotheses are, however, testable with establishment data. The number of establishments operating during various periods does indicate the varying magnitude of industrial activity in a place. And, in a similar vein, the number of establishments operating in each of the major industry groups over time can serve to identify changes in local industrial diversification. The purpose was simply to determine whether or not industrial growth accelerated and diversification increased in the post-rail period in the communities analyzed.

The survey data also served to indicate whether or not additional specializations, and especially those typical of the post-rail period, developed in the communities. Here the magnitude of the establishments involved was also an factor, and this was suggested by the size of the establishment site.

While some establishments may have 'underfit' the larger sites, the ones on which early industrial structures survived suggested that this would be the exception. In the field area, only seven percent of the surviving industrial structures on the multiple (three or more) lot sites were substantially smaller than the sites. And in many of those instances, other early industrial structures that once existed on the site may have been demolished. This was often the case where management did know the site history, but the informed responses were not frequent enough to suggest a percentage.

Hypothesis 1: Accelerated Post-Rail Growth in the Number of Industrial Establishments

The total number of manufacturing establishments operating in each community in each five year period between 1840-1890 (Figure 3) provided a simple basis for comparison of pre- and post-rail establishment growth. While short term variations in the establishment totals occurred, they did not obscure the longer pre- and post-rail trends.

In Terre Haute, much more rapid industrial establishment growth occurred after the 1850 arrival of the first railroad than had characterized the preceding five-year periods. More rapid establishment growth began in the 1855-1859 period, and continued through 1880-1884 when the number of establishments reached a level over 19 times that documented for 1850-1854 (when the railroad arrived). This was by far the largest increase among the five communities, and Terre Haute was the only one in which accelerated growth in the number of industrial establishments was sustained through the post-rail period (excepting 1875-1879 and 1885-1889).

Only two pre-rail industrial establishments operated at the Brazil site during the 1845-1849 period. Brazil's gradual post-rail development between 1850 and 1879 resulted in a small industrial base comparable to those of the other towns considered. The late (1880-1889) surge in the number of establishments was related to the 1882 location of the large Central Iron and Steel Works in the town. The immediate impact of the new facility was a doubling of the number of local industrial establishments in the 1880-1884 period.

In Middlebury-Clay City, the failure of the 1873 railroad to reach Middlebury resulted in the prompt establishment of Clay City. Middlebury declined rapidly, and the doubling in establishments during 1875-1879 at Clay City was followed by only slight growth between 1880 and 1889.

In Clinton the railroad arrived in 1873, and the number of local manufacturing establishments operating there between
1870-1879 reached a total more than double the pre-rail five year maximum. During 1880-1889 the number of establishments then declined to the pre-rail level.

In the Eugene-Cayuga area, the routing of a railroad near Eugene was enough to stimulate a doubling of its industrial establishments (1870-1874). However the total number of establishments then declined between 1875-1884 as the lack of a rail connection at Eugene proved to be a disadvantage.

In 1882, the town of Cayuga was established along a second nearby line. The relocation of the Eugene flour mill to Cayuga stimulated population growth there, and other industries began to be attracted to the town. The small 1885-1889 increase in establishments suggested the beginning of this later development.

In each community considered, the arrival of the railroad was associated with an immediate expansion of the number of industrial establishments. Even at Eugene, the arrival of a nearby railroad was enough to produce a short lived expansion in the town. Yet, an accelerated growth of establishments over the post-rail period was limited to Terre Haute, the largest of the communities considered. Clearly, the hypothesis of sustained, more rapid post-rail establishment growth was not applicable to the smaller Western Indiana communities (the towns).

In addition to advantages in local operating costs, the quality of local leadership, access to information, innovation adoption, and access to capital have each been cited as important factors in local development (Abbott 1981; Mc Kelvey 1973; Pred 1966; Stokman and Doctor 1987; Warner 1963). It would appear that the level of advantage offered in these as well as other development factors differed appreciably between the regional center (Terre Haute) and the four towns considered. The growth point concept (Smith 1981), suggesting growth will be concentrated at larger centers offering greater comparative advantage, would appear to apply to this aspect of western Indiana post-rail community development.

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Figure 3: Total Number of Industrial Establishments by Community, by Five Year Period, 1840-1889
**Hypothesis 2: Increased Post-Rail Industrial Diversification**

The industrial classification adopted here for pre- and post-rail comparisons was based upon the two-digit major industries utilized by the Bureau of the Census. In two instances, industries in which there were few area establishments were combined. As a result, 12 industry ‘groups’ were adopted for the analysis (Table 1).

Using these codes, it was possible to compare the diversity of a community’s total pre- and post-rail industry based on the total number of establishments that operated in each group during each period. Lorenz curves and GINI coefficients (Holloway and Wheeler 1991) were used to develop the comparisons. In this analysis, the five year period of the first rail service in a community was considered to be post-rail.

Lorenz curves are simply cumulative curves. The percentage of establishments that operated in each of the 12 groups was determined, pre- and post-rail, for each community. Pre- and post-rail cumulative curves were then developed by community (Figure 4), beginning with the smallest percentage in an industry group, and adding the next highest value at each step.

GINI coefficients were then calculated for each curve. The coefficient was based on the ratio of the area between the curve and the diagonal line to the total area below the diagonal. If perfect diversification were to occur (in this analysis where the same number of establishments operated in each group), the Lorenz curve would be identical with the diagonal. There would be no area between the lines, and the coefficient value would be zero. With increasing specialization of industry, the area between the curve and the diagonal would increase and generate a progressively higher GINI coefficient.

In each community, the post-rail curve was closer to the diagonal than the pre-rail curve, and the post-rail GINI coefficient was smaller (Table 2). Accordingly, post-rail industrial diversification did occur in each of the five communities considered, and the hypothesis of diversification was accepted.

Excluding Brazil, the decline in GINI coefficient ranged from 0.089 to 0.119 points, and the community rank order based on GINI coefficients was the same in the pre- and post-rail economies (Table 3). Because of Brazil’s near lack of pre-rail industry its coefficient decline was substantially larger (0.430), and it shifted from the least to the most diversified of the five communities. The similar increase of post-rail industrial diversification among the communities that had developed prior to rail connection does, however, suggest that it was a consistent aspect of post-rail community development.

**Table 1: The Industrial Groups Analyzed by Standard Industrial Classification Two Digit Code and Description**

<table>
<thead>
<tr>
<th>Code</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>20</td>
<td>Food and Kindred Products</td>
</tr>
<tr>
<td>22-23</td>
<td>Textile Mill and Apparel Products</td>
</tr>
<tr>
<td>24-25</td>
<td>Lumber and Wood Products, Furniture</td>
</tr>
<tr>
<td>27</td>
<td>Printing and publishing</td>
</tr>
<tr>
<td>28</td>
<td>Chemical and Allied Products</td>
</tr>
<tr>
<td>31</td>
<td>Leather and Leather Products</td>
</tr>
<tr>
<td>32</td>
<td>Stone, Clay, and Glass Products</td>
</tr>
<tr>
<td>33</td>
<td>Primary Metal Products</td>
</tr>
<tr>
<td>34</td>
<td>Fabricated Metal Products</td>
</tr>
<tr>
<td>35</td>
<td>Machinery, Except Electrical</td>
</tr>
<tr>
<td>37</td>
<td>Transportation Equipment</td>
</tr>
<tr>
<td>38</td>
<td>Instruments and Related Products</td>
</tr>
</tbody>
</table>

**Table 2: Pre- and Post-Rail GINI Coefficient by Community**

<table>
<thead>
<tr>
<th>Community</th>
<th>Pre-Rail Coefficient</th>
<th>Post-Rail Coefficient</th>
<th>Difference</th>
</tr>
</thead>
<tbody>
<tr>
<td>Brazil</td>
<td>.833</td>
<td>.403</td>
<td>-.430</td>
</tr>
<tr>
<td>Clinton</td>
<td>.753</td>
<td>.664</td>
<td>-.089</td>
</tr>
<tr>
<td>Eugene-Cayuga</td>
<td>.670</td>
<td>.551</td>
<td>-.119</td>
</tr>
<tr>
<td>Middlebury-Clay City</td>
<td>.793</td>
<td>.695</td>
<td>-.098</td>
</tr>
<tr>
<td>Terre Haute</td>
<td>.524</td>
<td>.412</td>
<td>-.112</td>
</tr>
</tbody>
</table>

**Hypothesis 3: Expanded Post-Rail Industrial Specialization**

Local production must generate substantial income from external markets for an industry to be considered a community specialization. In this analysis, an industry was considered to be a specialization only if its establishment sites were either among...
the largest in the community or numerous enough to generate a large product surplus over local needs (and, thereby, the requisite external income). In addition, the requirement was adopted that a local industry was in operation long enough to have constituted a sizeable part of the economic base of the community during the period considered.

Clearly, most local industries in the pre- and post-rail periods did not qualify as community specializations. Industries dominantly supplying local consumer goods or services (e.g. dressmakers, confectioners, blacksmiths, and print shops) could be excluded at the outset. Many others involved only a few small establishments (apparent from the size of the sites occupied), and did not represent a substantial part of the local industrial base. Some large establishments operated only briefly within a community, and their operation would also not have represented a significant pre- or post-rail specialization of a community.

The remaining industries for each community in the pre- and post-rail periods were the main components (the specializations) of the industrial base of each place. The pre- and post-rail specializations differed in each of the five communities considered (Table 3).

In Terre Haute, the pre-rail specializations all survived into the post-rail period. Post-rail additions included breweries and distilleries, hominy and woolens mills, overalls production, and a variety of metal product industries. The production of iron and steel, fabricated metal products, and transportation equipment represented a major change from the pre-rail focus on processing local raw materials. The new metal industry specializations were, indeed, among the types characteristic of the industrial rather than the merchant economy (Meyer 1990).

The 1882 location of an iron and steel facility in Brazil, and the subsequent development of a foundry and a fanning mill represented similar, if more modest, new specializations in that community. However, until the 1880-1885 period, the new post-
rail specializations in Brazil included only the traditional resource based flour mills, sawmills, potteries, and brick and tile establishments. These were new specializations in the post-rail period largely because so little pre-rail industrial development occurred there. The location of the first large metal industry in Brazil, the iron and steel works, occurred 32 years after the arrival of the railroad, and the foundry and fanning mill operations were established only afterwards.

At Middlebury-Clay City, where pre-rail development was also modest, both early specializations survived into the post-rail period. The post-rail addition of sawmills and brick and tile works expanded the community focus on processing local materials and helped sustain modest local growth.

In contrast, the number of specializations declined at both Clinton and Eugene-Cayuga. None of the pre-rail specializations survived into the post-rail period at Clinton, where only a woolens mill replaced them. Three of the four pre-rail specializations at Eugene-Cayuga continued operation into the post-rail period, but no new ones were added. In both communities, the focus remained on processing local materials.

A substantial increase in industrial specializations throughout the post-rail era, including ones characteristic of the new industrial economy, was limited to Terre Haute. Among the towns, new post-rail specializations predominantly continued to involve industries that utilized local materials. The increase was modest at Middlebury-Clay City and Brazil (until 1882), and at both Clinton and Eugene-Cayuga a net decline occurred in the number

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**Table 3: Pre- to Post-Rail Change in Industrial Specializations by Community**

<table>
<thead>
<tr>
<th>SPECIALIZATION BY COMMUNITY</th>
<th>Terre Haute</th>
<th>Clinton</th>
<th>Eugene-Cayuga</th>
<th>Brazil</th>
<th>Middlebury Clay-City</th>
</tr>
</thead>
<tbody>
<tr>
<td>Industry</td>
<td>Flour Mill</td>
<td>Flour Mill</td>
<td>Tannery</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Lost</td>
<td>Pork Packing</td>
<td>Sorghum Mill</td>
<td>Tannery</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Retained</td>
<td>Flour Mill</td>
<td>Pork Packing</td>
<td>Sawmill</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>Pork Packing</td>
<td>Sawmill</td>
<td>Sawmill</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>Sawmill</td>
<td>Tannery</td>
<td>Floory</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>Tannery</td>
<td>Foundry</td>
<td>Pottery</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Gained</td>
<td>Brewery</td>
<td>Woolen Mill</td>
<td>Flour Mill</td>
<td>Sawmill</td>
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<td>Distillery</td>
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<td>Wollens Mill</td>
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of industrial specializations. Once again, the model of the regional growth point (Terre Haute) that differed substantially from the smaller centers (the towns) proved applicable.

At the town level, simply the arrival of the railroad was not sufficient to sustain a sizeable increase in the number of post-rail industrial specializations. That apparently required a subsequent event, such as the attraction of a large scale establishment, which would independently generate substantial community development (e.g. the iron and steel works at Brazil). Thus, under exceptional conditions, the development limitations of the small community could eventually be overcome in the post-rail period, and an increase of specializations including industries independent of local resources could occur.

**Conclusions**

Sustained, accelerated post-rail growth in the number of industrial establishments (Hypothesis 1) occurred only in Terre Haute. Among the smaller communities, the rail connection stimulated an initial establishment increase followed by either slow growth or a decline in the number of establishments. The accelerated growth in Brazil occurred long after the establishment of rail service, and was in response to the attraction of a single large steel operation.

All five communities exhibited increased post-rail industrial diversification (Hypothesis 2), and the magnitude of the increase was generally similar. In Brazil the increase was greater since the community had almost no pre-rail industry. Subsequent to the rail connection, a comparative advantage for new types of industry developed among the communities considered, irrespective of community size and development history.

A substantial post-rail increase in the number of industrial specializations, which included types characteristic of the post-rail period (Hypothesis 3), was initially limited to Terre Haute. The replication of that type of development in Brazil occurred only after the late location there of the steel mill. In general, then, the towns considered did not exhibit the hypothesized increase in the number and types of industrial specializations.

It would seem that at the small city - town scale in the urban hierarchy, the post-rail industrial transition impacts analyzed differed markedly between the dominant area center (e.g. the small city) and the towns. Accordingly, the growth point model appeared to be applicable. Given the small number of communities analyzed, the general conclusions are necessarily tentative. They are, however, sufficiently clear to suggest the value of further comparative community analysis of the impacts of the mid-nineteenth century industrial transition in the Midwest.

**References**


