

Master Thesis

The Steel Hangover:

Regional Revitalization in Post-Steel Pittsburgh and Sheffield

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Abstract

The former “Steel Cities” of Sheffield, UK and Pittsburgh, USA have struggled to grow and attract a modern, knowledge-based economy. From the 1970s to early 1980s, their traditional manufacturing economies began to breakdown, rendering the economic logic of their industrial structures obsolete. The comparative advantage of OECD cities shifted from physical manufacturing to the packaging and generation of knowledge. However, certain characteristics of Pittsburgh and Sheffield’s former manufacturing economies have persisted and hindered their economic recovery. This paper will argue that both Pittsburgh and Sheffield suburbanized very early because of their steel industries. These communities were fragmented geographically and economically, and became overly-specialized and dependent on steel. It will show that policy has not adequately addressed these problems and, at times, has succeeded in accentuating them. Policy-makers’ initial reaction to the steel industry’s decline was to subsidize inefficient mills. When the subsidies failed, Pittsburgh and Sheffield had not pursued alternative economic development strategies. The cities suffered a concentrated decrease in employment and general economic shock. The paper will then demonstrate how later economic development plans were influenced by the historical relationship between policy-makers and private industry. The varying challenges and failures of these revitalization plans will be analyzed and discussed. The paper argues that Pittsburgh and Sheffield have mistakenly confused the terms ‘knowledge economy’ and ‘information technology’, resulting in a misguided attempt at creating an IT economy. Finally, the effectiveness of current “green economy” revitalization plans will be evaluated and placed within a historical context. The paper concludes that the global economy, and economic logic of Sheffield and Pittsburgh, was forever changed in the twentieth century. The cities’ efforts to maintain their brand as a world economic leader is unrealistic and, in fact, counterproductive to successful, but moderate, economic development.

Abstract

Die ehemaligen “Stahl-Städte“ Sheffield in Großbritannien und Pittsburgh in den USA kämpfen um Wachstum und den Aufbau einer modernen, wissensbasierten Wirtschaftsstruktur. In den 1970iger und frühen 1980er Jahren erlebte deren traditionelle Industrie einen Niedergang, welche die ökonomische Logik ihrer industriellen Struktur obsolet werden ließ. Der komparative Vorteil von Städten in den OECD-Ländern verschob sich von der alten Industrie zur Konfektionierung und zur Wissensgenerierung. Allerdings bestanden bestimmte Eigenschaften der ehemaligen Industrie in Pittsburgh und Sheffield weiter und verhinderten einen Wirtschaftsaufschwung in diesen Städten. In dieser Arbeit wird dargelegt, dass sowohl in Pittsburgh als auch in Sheffield wegen der Stahlindustrie sehr früh eine Suburbanisierung stattgefunden hat. Diese Gemeinden waren geographisch und ökonomisch zersplittert, sie wurden zu spezialisiert und abhängig von der Stahlindustrie. Es wird gezeigt, dass die Politik diese Probleme nicht adäquat behandelt und sie zeitweise sogar verschärft hat. Die erste Reaktion der Politiker auf den Niedergang der Stahlindustrie war die Subventionierung der ineffizienten Betriebe. Als die Subventionierung scheiterte, verfügten Pittsburgh und Sheffield über keine alternativen ökonomischen Entwicklungsstrategien. Die Städte erlitten einen geballten Rückgang der Arbeitslosigkeit und einen allgemeinen wirtschaftlichen Schock. Die Masterarbeit zeigt weiter, wie spätere Pläne für die wirtschaftliche Entwicklung von den historischen Verbindungen zwischen Politikern und Privatindustrie beeinflusst wurden. Die verschiedenen Herausforderungen und Misserfolge dieser Revitalisierungspläne werden analysiert und diskutiert. In der Arbeit wird dargelegt, dass Pittsburgh und Sheffield irrtümlicherweise die Begriffe „Wissensbasierte Ökonomie“ und „Informationstechnologie“ verwechselt haben, was einen fehlgeleiteten Versuch, eine IT-Wirtschaft aufzubauen, zur Folge hatte. Schließlich wird die Effektivität von derzeitigen Revitalisierungsplänen durch eine „grüne Ökonomie“ evaluiert und im historischen Kontext betrachtet. Die Arbeit kommt zu dem Schluss, dass die globale Wirtschaft und die ökonomische

Logik von Sheffield und Pittsburgh im 20. Jahrhundert für immer verändert wurden. Die Bemühungen der beiden Städte um das Markenzeichen, weltweit ökonomisch führend zu sein, sind unrealistisch, ja kontraproduktiv für eine erfolgreiche, aber moderate, wirtschaftliche Entwicklung.

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I. Introduction

In the second half of the twentieth century, increased integration of the global economy caused many OECD nations to lose their comparative advantage in physical manufacturing.¹

Improvements in technology decreased the industries' payrolls and better transport allowed a greater percentage of manufacturing to be completed by cheaper, foreign labour sources.

Dominant manufacturing cities in nations such as Germany, the United States, and England, experienced economic hardship as employment in their primary industry declined.

Pittsburgh, USA and Sheffield, UK were once world famous for their steel manufacturing-based economies. They were each known by the moniker "Steel City" and, in many ways, Pittsburgh and Sheffield were "symbol[s]" of the "spectacular advance of [the manufacturing]...industry."² The cities grew with their respective steel industries into significant economic players, and a large portion of their populations were reliant on the industry's jobs. When steel industry employment declined in Pittsburgh and Sheffield in the 1970s and 80s, the cities' main means of existence disappeared. Today, the cities are 'world famous' for their economic troubles, and they have struggled to revitalize their once vibrant economies. Today, OECD cities' economic success is based on a new comparative advantage: the production of knowledge.³

The former dominance of steel manufacturing in Sheffield and Pittsburgh has affected the cities' ability to be economically successful. Pittsburgh has fared better than Sheffield in terms of

¹ Parts of this thesis use and build upon dissertation work previously undertaken by the author at the London School of Economics and Political Science, entitled "Transitioning From Steel to Knowledge: Challenges Faced by the Pittsburgh and Sheffield Regions". Both works are part of a coordinated double degree program funded by the European Union's Erasmus Mundus program.

² Roy Lubove, Twentieth-Century Pittsburgh: Government, Business, and Environmental Change (New York: John Wiley & Sons, Inc., 1969) 2.

³ OECD, "Knowledge Economy" (Paris: OECD 1996) <http://www.oecd.org/dataoecd/51/8/1913021.pdf> [accessed June 6th, 2008].

economic recovery, but both cities have experienced prolonged economic hardship since the decline of their steel industries. The nature of steel manufacture and its role in the cities' development left Pittsburgh and Sheffield with certain characteristics that were in opposition to the creation of a successful, modern economy. Additionally, the cities' economic development policies have failed to address some of these characteristics. Some of the features of their former manufacturing economies, which limit the cultivation of a modern, knowledge-based economy, still exist and have often not even been addressed by policy makers. Pittsburgh has been slightly more successful in growing its economy because it has corrected some of these negative characteristics, while simultaneously building on some of its more positive ones.

Both cities have suffered from the hype of the information technology revolution and the misunderstanding of a "knowledge economy" as one focused only on computer technology firms. As a result, few jobs have resulted for former employees of the steel industry. The recent acknowledgement of this mistake has led to new hype for a different type of economic revitalization: a 'green manufacturing economy' that would produce renewable energy for the region. The promoters of this plan hope to encourage the development of skilled, high paying jobs, much like those that once existed in the manufacturing economy. The movement symbolizes a hope that pervades former manufacturing regions across the globe; it is the hope that they can return once again to their glory days as powerful manufacturers.

This thesis will explore the revitalization efforts of Pittsburgh and Sheffield post steel. Examples of a wider phenomenon, the economic histories of Pittsburgh and Sheffield demonstrate the difficulties former manufacturing economies have faced as they struggle to adapt to the changing global economy. The thesis argues that the legacy of the cities' respective steel industries has

hindered the economic development of Pittsburgh and Sheffield in a “post-manufacturing” economic system.

II. Transitions in the Twentieth Century Global Economy

The economic changes that occurred in Pittsburgh and Sheffield were highly correlated to shifts in the global economy of the twentieth century. The cities' struggles are representative of a larger phenomenon that occurred in advanced economies around the globe. To understand the context of Pittsburgh and Sheffield, it helps to trace these global economic transitions. In the period before 1914, Britain was the international economic superpower. The country was the first "to industrialize, to adopt the gold standard, and to accept free trade as its commercial policy".⁴ However, after World War II, the United States surpassed Britain as the leader of the world economy. The years between 1950 and 1973 are recognized by economists as "the most prosperous of any such period in the history of the world economy."⁵ This progress is highly correlated to the extreme acceleration in technological progress and applications during this period. From the 1950s to 1960s, the "main players" remained the "industrialized countries of Western Europe, Canada, the United States, Japan, and Australia."⁶ However, advances in technology spread and were efficiently used by new, industrializing powers such as the NICs in Asia and countries in South America, like Brazil. More players entered the market, benefiting from the latest technology and offering multinational corporations significantly cheaper labour costs.

The manufacturing industries of advanced countries in North America, Britain, and Western Europe slowly began shifting towards more service oriented, knowledge- based economies. According to Kenwood and Loughheed, "the industrial countries' share of world trade in

⁴ A.G. Kenwood and A.L. Loughheed, *The Growth of the International Economy 1820-2000* (Routledge: New York, 1999) 334.

⁵ A.G. Kenwood, 336.

⁶ A.G. Kenwood, 336.

manufacturers has fallen since the 1970s as the NICs increase their share.”⁷ Additionally, the average annual growth rate of the world economy fell from 5 to 2.9 per cent between 1973 and 1980, and experienced further decreases from 1980-90 and 1990-1997.⁸ In a departure from the past, the “leading growth countries of the 1980s were Japan (3.8 per cent), Finland (3.7 per cent), and Ireland (3.4 per cent).”⁹ Simultaneously, rapidly advancing countries such as Singapore (8.2 per cent), South Korea (7.1 per cent), and Taiwan (6.5 per cent) were experiencing “much higher rates of economic growth”.¹⁰ The “Gerschenkronian” late developers were able to build factories with newer, more efficient processes, employ inexpensive labour, and utilize increasingly cheaper transport and communication costs to export their goods around the world. In several manufacturing sectors, they began to outperform traditionally advanced economies, many of whom were heavily invested in outdated technologies, while simultaneously faced with labour disputes and environmental regulation costs. In addition to loss of market share, technological improvements rendered many manufacturing jobs in these countries redundant. Firms in advanced economies such as the United States, Germany, and Britain eliminated jobs which could now be cheaply performed by machines. More products were able to be produced with less manpower, saving firms costs in labour.

The information technology revolution led many to proclaim the wonders of the “new knowledge economy” and downplay the importance of location economics. Downtrodden economies were promised that with the introduction of IT technology, their unemployment problems would be solved. However, today, many former industrial towns in advanced

⁷ A.G. Kenwood 307.

⁸ A.G. Kenwood 307.

⁹ A.G. Kenwood 309

¹⁰ A.G. Kenwood 309

economies are still struggling to attract industry and revitalize their economies. The dot-com bust of the 1990s and recent events have helped foster negative sentiments towards the promises of the 'knowledge economy', leading to a new wave of Keynesian policies and efforts to promote the development of a "green economy". These changes in the global economy are reflected on a micro- level in the experiences of Pittsburgh and Sheffield and will be explored in further detail.

III.Changes in the Global Steel Industry

Steel was the main manufacturing industry of Pittsburgh and Sheffield. The changes in the global economy affected not only specific countries, but also global industries. The production and main actors of the steel industry changed dramatically over the span of the 20th century. In 1868, the Bessemer steel converter enabled producers to mass manufacture steel for the first time.¹¹ Steel became a new industry. It “required substantially higher capitalization for entry, replaced most uses of iron, and was capable of economies of scale”.¹² This change in technology was most astutely harnessed by Andrew Carnegie and allowed the United States to take the position of Britain and Europe as the leading steel producer. Carnegie pioneered new advances in economies of scale by creating “integrated factories”, in which all operations “were concentrated in one factory under centralized management, achiev[ing] economies of scale and speed of output that guaranteed large profits”.¹³ Such methods resulted in the United States’ establishing itself as the world leader of steel manufacturing. The new method of producing steel became so profitable that other producers were also driven to adopt it. In 1911, steel manufacturing shifted from Bessemer to open hearth production, but the industry continued to employ large amounts of workers and experienced increasing demands during the periods of World War I, World War II, and post- World War II reconstruction.¹⁴

However, from 1950 to 1975, the United States lost its title of king of steel. Although the post-World War II reconstruction resulted in the European common market nations participating in the industry once again, this was not the main cause of the United States’ woes. In fact, the

¹¹ Ronald E. Seavoy, *An Economic History of the United States: From 1607 to Present* (New York: Routledge, 2006), 247.

¹² Seavoy, *An Economic History of the United States: From 1607 to Present*, 247.

¹³ Seavoy, 248.

¹⁴ Seavoy, 248.

common market nations faced many of the same challenges as the US: loss of market share, high labour costs, uncompetitive prices, and an overall decrease in demand for steel. Except for decrease in demand, these problems were largely caused by the failure of steel firms in the European common market nations and US to invest in new, competitive technologies. According to business scholars, “these investments were essential if steel made in integrate steel mills...was to be competitive with imported steel in the domestic market”.¹⁵ The main challenger to American and European common market nations’ steel industry was Japan. Japanese steel producers became very competitive in price and productivity by investing large amounts of money into the latest technology. From 1968 to 1974, Japanese steel manufacturers “invested 14.2 billion dollars; steel producers in common market nations¹⁶ invested 14.3 billion dollars, and the U.S. steel producers invested 12.0 billion dollars”.¹⁷

Furthermore, investments in the U.S. and common market nations were not allocated efficiently and did not go towards consistently updating factories with the latest technology. In short, “the Japanese advantage in production efficiency can be attributed largely to consistently shrewd investment decisions and technological adaptation geared to the rigors of world export market standards”.¹⁸ More productive and efficient technology gave the Japanese steel industry lower labour costs and, ultimately, more competitive pricing. Firms in the United States and European common market nations had failed to update their factories’ technologies, opting instead to pocket their profits. Unable to compete with Japanese prices, the United States and common

¹⁵ Seavoy, 300.

¹⁶ “Common Market Nations” is a term used in the English-speaking world to refer to the European Economic Community (EEC), which was created in 1957 and originally consisted of Belgium, France, Germany, Italy, Luxembourg, and the Netherlands, but which expanded over time before becoming enveloped under the umbrella of European Union, in 1993.

¹⁷ Seavoy 301.

¹⁸ Seavoy 301.

market nations' developed a trigger pricing mechanism agreement, which made Japanese steel more expensive within their borders, allowing the countries' steel industries the ability to compete domestically.¹⁹ However, this did not make U.S. or common market countries' steel industries any more competitive on an international level. In fact, "the long-term effect of protection...was to delay restructuring of the steel industry into fewer producers at the best locations".²⁰

Instead of using the profits gained from protections against Japanese imports to update and restructure steel manufacture, producers in the United States and common markets pursued a "strategy of diversification" from the 1960s and into the 1980s. Diversification meant buying other non-steel related companies, which were profit-making, to a company's portfolio- allowing the loss-making steel industry to remain unchanged. For example, "U.S. Steel acquired Marathon Oil Company,...whose profits were invested in petrochemicals while steel production was marginally profitable or lost money".²¹ According to Seavoy, approximately 15 percent of subsidized profits were used for "diversification."²² Protection from Japan and other countries with developing steel industries resulted in high prices. This resulted in a "substantial advantage to Japanese and Korean automobile manufacturers" since the "sheet steel [used]... was 25 to 30 percent cheaper than steel produced in the United States or European common market nations".²³ Any domestic product of the U.S. or European common market nations that was made with steel suffered the disadvantage of higher material costs.

¹⁹ Seavoy 303.

²⁰ Seavoy 302.

²¹ Seavoy 304.

²² Seavoy 304.

²³ Seavoy 304.

Academics have analyzed the decline of the steel industry in the US and UK from two different policy perspectives. According to one viewpoint, government policies which instituted high wages, emissions regulations, and protective subsidies disincentivized industrial leaders from heavily investing in new equipment and processes.²⁴ From this perspective, government interference negatively affected the steel industries of the US and UK. However, this view is challenged by a different argument- namely that the decline of the steel industry was the result of too little government regulation. According to this view, multinational corporations shifted from buying and producing steel only in their home countries to buying steel wherever it was cheapest. From this perspective, proponents argue that the governments of the UK and US could have limited their MNCs' ability to relocate their steel purchasing and manufacturing through strong regulation. This could have preserved the US and UK home market share and encouraged the firms' to update local factories.

Both perspectives agree on one matter: steel industry leaders in the UK and US lacked incentives to invest in the new technologies and processes that would help make their factories competitive with industry newcomers in Asia, Eastern Europe, and South America. Today, "there are no national steel industries in the United States, Canada, and the European Union in the sense that integrated steel mills within national borders are owned by companies headquartered in that nation".²⁵ New, competitive steel mills are being built in Brazil (which are co-financed by firms from Japan, Korea, and the EU) and China. These mills will be very competitive due to low labour costs and new technologies.²⁶ The changes in the steel industry of

²⁴ Seavoy 303-305.

²⁵ Seavoy 304.

²⁶ Seavoy 305.

the twentieth century, and the United States' and the European common market nations' inability to adapt, resulted in an extreme redundancy in jobs. These transitions were felt on a local level in Pittsburgh and Sheffield.

IV. Economic Trends and Figures in Pittsburgh, USA and Sheffield, UK

When steel manufacture employment declined, the cities of Pittsburgh and Sheffield experienced a series of changes. Pittsburgh and Sheffield each saw their rate of unemployment increase. Sheffield's unemployment in 1975 was 2%. In 1981, unemployment was 8% and 38,000 workers were unemployed. Its unemployment rate peaked in 1986 as 17% of the labour pool lacked employment. Although these figures track with the overall UK trend, it is important to note that "until 1982 Sheffield's [unemployment] level remained below the national average [and it] has stayed well above it ever since"²⁷. In recent times, Sheffield's unemployment rate has been approximately 6%, while the UK has averaged 5.2%.²⁸ Pittsburgh has experienced similar trends. In 1975, its percentage of U.S. unemployment insurance compensation was 1.36%.²⁹ By 1983, its share had nearly doubled to 2.84%. In 2006, it was 1.55%.³⁰ In recent years, though, Pittsburgh's unemployment rate, in comparison to the U.S. average, has improved. In 2007, 4.3% of the population was unemployed, compared to the U.S. average of 4.64%.³¹ However, this figure may be deceptive since Pittsburgh has annually decreased in population.

²⁷ Paul Allender, *What's Wrong With Labour?* (London: Merlin Press, 2001) 98.

²⁸ NOMIS Official Labour Market Statistics:
https://www.nomisweb.co.uk/reports/lmp/la/2038432027/subreports/pop_time_series/report.aspx?
[accessed August 2, 2008].

²⁹ U.S. Unemployment Insurance is an accurate indicator for the number of newly unemployed workers eligible for temporary unemployment pay. This figure was used because the data was the most accurate available to indicate unemployment trends. Census data can be problematic because officials have used different units, definitions, and methods throughout the years. Therefore, it is necessary to search for data that has been recalculated and harmonized based on the same units, definitions, and methods. This method of choosing appropriate statistics has been used throughout the thesis.

³⁰ U.S. Bureau of Economic Analysis: http://www.bea.gov/regional/remdChart/default.cfm#chart_top
[accessed August 5, 2008].

³¹ U.S. Bureau of Labor Statistics: http://www.bls.gov/eag/eag.pa_pittsburgh_msa.htm [accessed August 20, 2008].

Demographically, both cities have seen their population decrease. Sheffield and Pittsburgh suburbanized much earlier than other cities in their nation due to the industrial geography of the steel industry. This geographical trend will be examined in the following chapters. As steel employment collapsed in the two cities, there was a marked increase in the rate of people leaving the region. In 1980, Pittsburgh's city had a population of 423,959 and its metropolitan area was approximated at 2,219,000. Today, Pittsburgh city has a population of approximately 312,819 and its metropolitan area is home to about 2,462,571. It moved from the 13th most populous metropolitan area in 1980 to the 20th in 2000.³² Sheffield had approximately 547,500 people living in its center in 1981. Today, that population is approximately 525,800 people. Its metropolitan area has a population of approximately 1,819,500.³³

The cities have also underperformed in comparison to their national economies. Sheffield has not significantly increased its economic contribution to the UK economy in terms of gross value added. In 1995, Sheffield's gross value added was an 88 (with the UK average being measured at 100). In 2004, it had increased to only 89. This is in comparison to Leeds, whose GVA increased from 114 in 1995 to 119 in 2004.³⁴ In the past, Pittsburgh has also lagged behind its national economy. From 1970 to 1996, the average rate of job growth in Pittsburgh was 15.6%. During the same time span, job growth was 50.6% in heartland urban areas and an average of 63.9% growth in the nation.³⁵ Such figures should be viewed with some skepticism. Based on

³² City Data Online Database: <http://www.city-data.com/us-cities/The-Northeast/Pittsburgh.html> [accessed July 14, 2008].

³³ NOMIS Official Labour Market Statistics: https://www.nomisweb.co.uk/reports/lmp/la/2038432027/subreports/pop_time_series/report.aspx? [accessed August 2, 2008].

³⁴ Office for National Statistics, UK: <http://www.statistics.gov.uk/Statbase/Product.asp?vlnk=14650> [accessed August 2, 2008].

³⁵ Robert E. Gleeson and Jerry Paytas, "Pittsburgh: Economic Restructuring and Regional Development Patterns, 1880-2000," *Sunbelt/Frostbelt: Public Policies and Market Forces in Metropolitan Development*, ed. Janet Rothenberg Pack (Washington D.C., Brookings Institution Press: 2005), 192.

the percentages alone, it is entirely possible that the majority of the United States was underdeveloped (in terms of jobs) before 1970, while Pittsburgh was developed or overdeveloped. Differences in numbers of actual jobs may account for some of the difference between the figures, however, the population and unemployment numbers indicate that Pittsburgh was struggling economically compared to other urban centers in the United States.

The economies of Pittsburgh and Sheffield were based heavily on their steel and related manufacturing industries. As the respective cities' nations hemorrhaged jobs in these sectors, the composition of employment sectors shifted. This trend is accurately illustrated by national employment sector numbers.³⁶ In 1961, the United Kingdom's manufacturing and extractive (including metallurgy and coal) industries employed 8.974.000 and 749.000 workers, respectively. In 1971, 7.626.000 workers were employed by the manufacturing sector and 261.000 were employed by the extractive sector. These numbers continued to decrease in 1981, with 6.498.000 working in the manufacturing industry and 354.000 working in the extractive sector. By 1991, the numbers had decreased to 5.397.000 and 223.000 respectively. The last collected figure, in 2001, shows 3.597.226 employed by the manufacturing sector and 115.000 employed by the extractive sector. This decline in number of jobs is in contrast to commerce/finance and services sectors. In 1961, Britain employed 5.997.000 in the services sector and 3.839.000 in commerce/finance. By 2001, the number had increased to 8.737.000 in services and 9.880.000 in commerce/finance. From 1961 to 2001, the manufacturing and extractive employment sectors continually lost jobs while employment in the services and commerce/finance steadily increased.

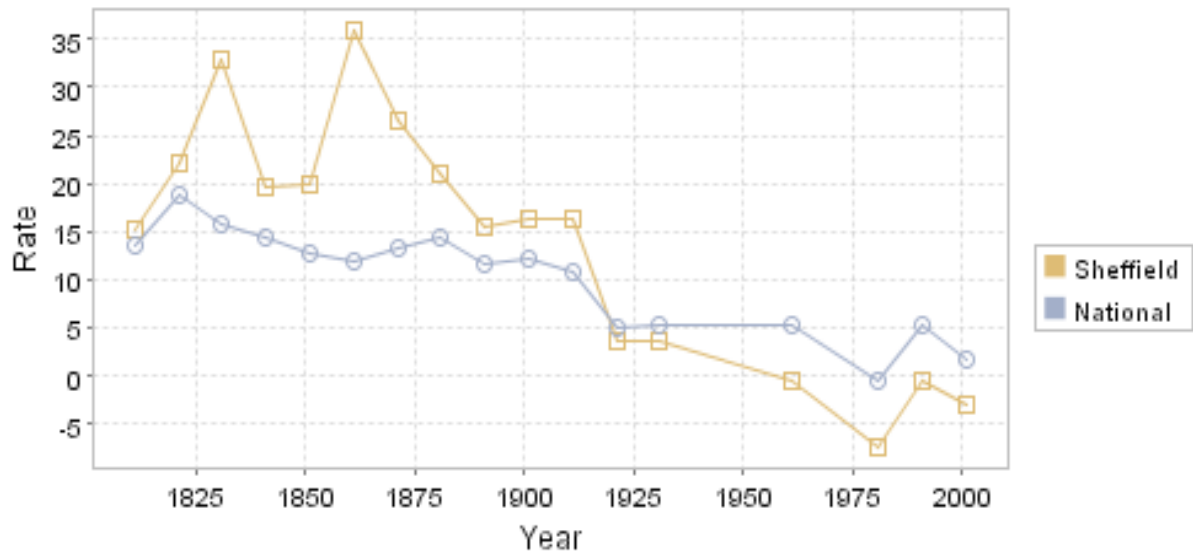
³⁶ As previously noted, it can be problematic to compare census data if the data was collected using difference units, definitions, and methods and has yet to be harmonized by census officials. Local employment by sector data for Pittsburgh and Sheffield from 1961 to 2001 has yet to be harmonized. The information collected by the census is based on differing borders and definitions. The borders of Sheffield city, Sheffield metropolitan, South Yorkshire county have changed over time and the censuses differ in whether they use Allegheny county as the main unit of measurement or the smaller Pittsburgh metropolitan area. Additionally, the categories used for 'employment sectors' also differs. Therefore, the most accurate means of historical comparison are harmonized national figures, derived *International Historical Statistics*.

The United States experienced a similar shift in employment.³⁷ In 1960, 19,455,000 and 714,000 workers were employed in the manufacturing and extractive sectors, respectively. In 1970, these numbers had decreased to 23,143,000 and 532,000. By 1980, 24,973,000 and 1,003,000. 1990, 22,463,000 and 766,000. 1995, 21,333,000 and 707,000. While the decrease in employment in the manufacturing and extractive services does not seem as stark as Britain, the sectors' numbers appear stagnant and disappointing when compared to the growth in U.S. services and commerce. In 1960, 19,060,000 workers were employed in services and 15,032,000 were working in the commerce/finance sector. By 1995, these figures had jumped to 45,083,000 and 42,035,000 workers, respectively. The categories of "manufacturing" and "extractive" are not exclusive to the steel industries and include a wide variety of industries such as the automotive, coal, textile, and software sectors. This introduces a certain amount of confusion into the numbers when discussing steel and related industries. While there remains much ambiguity in the employment categories, the figures nevertheless support the assertion that the dominance of the extractive and manufacturing industries, in terms of employment numbers, decreased while that of the service and finance/commerce sectors increased.

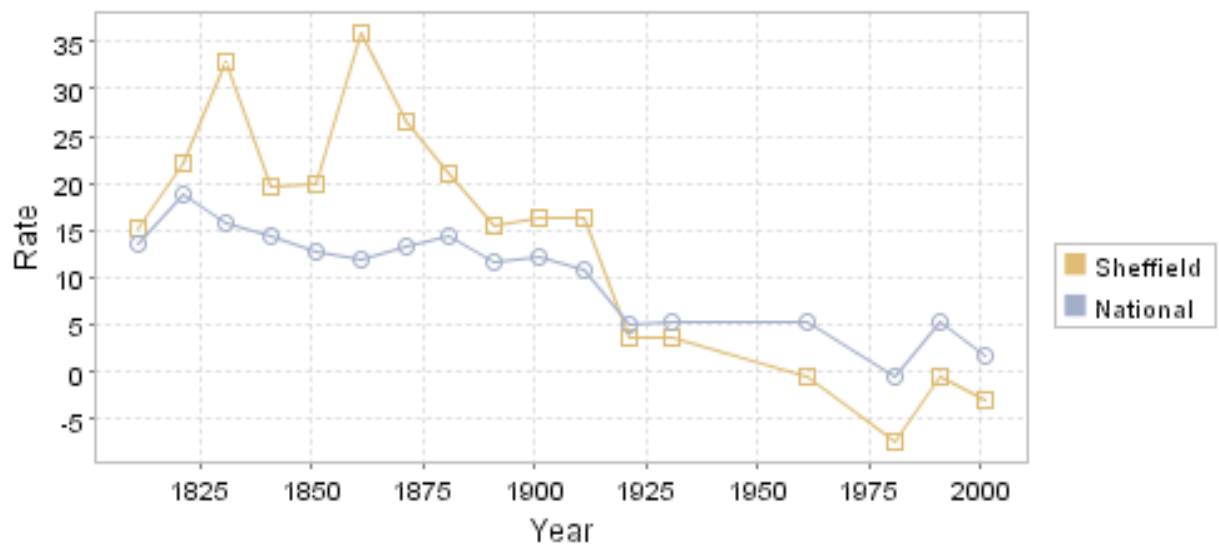
The figures also raise an interesting point on the role of gender on employment numbers and sectors. In both the US and the UK, very few women, in comparison to men, were employed in the extractive industry. In 1961, the UK employed 728,000 men and 21,000 females in the extractive industry (which includes metallurgy). In 2001, 104,000 men and 11,000 women work in the extractive industry. The decrease in employment for men was significantly sharper than

³⁷ As previously noted, it can be problematic to compare census data if the data was collected using difference units, definitions, and methods. Local employment by sector data for Pittsburgh and Sheffield from 1961 to 2001 has yet to be harmonized. The information collected by the census is based on differing borders. The borders of Pittsburgh city, Pittsburgh metropolitan, Allegheny county have changed over time and the censuses differ in whether they use Allegheny county as the main unit of measurement or the smaller Pittsburgh metropolitan area. Additionally, the categories used for 'employment sectors' also differs. Therefore, the most accurate means of historical comparison are harmonized national figures, dating from 1960 to 1995, derived *International Historical Statistics*.

female employment. In the manufacturing industry, the UK employed 6.308.000 men and 2.666.000 women in 1961. By 2001, 3.596.000 men and 1.226.000 women worked in the manufacturing sector. Unlike the extractive sector, the decrease in male and female employment in this sector was more even. The UK services industry employed approximately 3.136.000 men and 2.861.000 women in 1961. By 2001, 2.952.000 men and 5.785.000 women worked in the sector. In this situation, employment actually decreased for the male workforce, while increasing for the female worker. Literature on Sheffield and Pittsburgh's economic struggles have referred to this "feminizing" of the service sector workforce, as male employment declined and female employment increased. The US experienced a similar change in the gender of the workforce (please refer to figure for further elaboration). Significant changes in terms of population, gender, employment sectors, and unemployment rates occurred as Pittsburgh and Sheffield's steel industry employment declined.



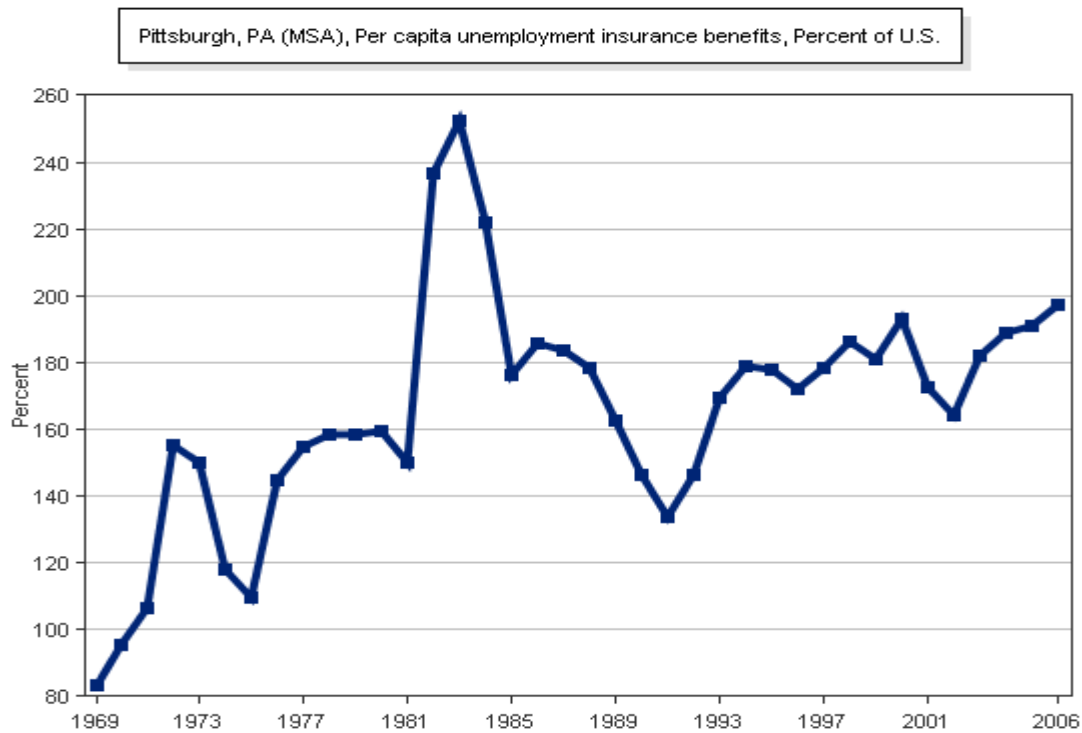
Male Unemployment in Sheffield and England and Wales
Source: A Vision of Britain Through Time³⁸



Population Change in Sheffield and England and Wales
Source: A Vision of Britain Through Time³⁹

³⁸ A Vision of Britain Through Time:

http://www.visionofbritain.org.uk/data_rate_page.jsp?u_id=10076882&c_id=10001043&data_theme=T_WK&id=0 [accessed August 10, 2008].

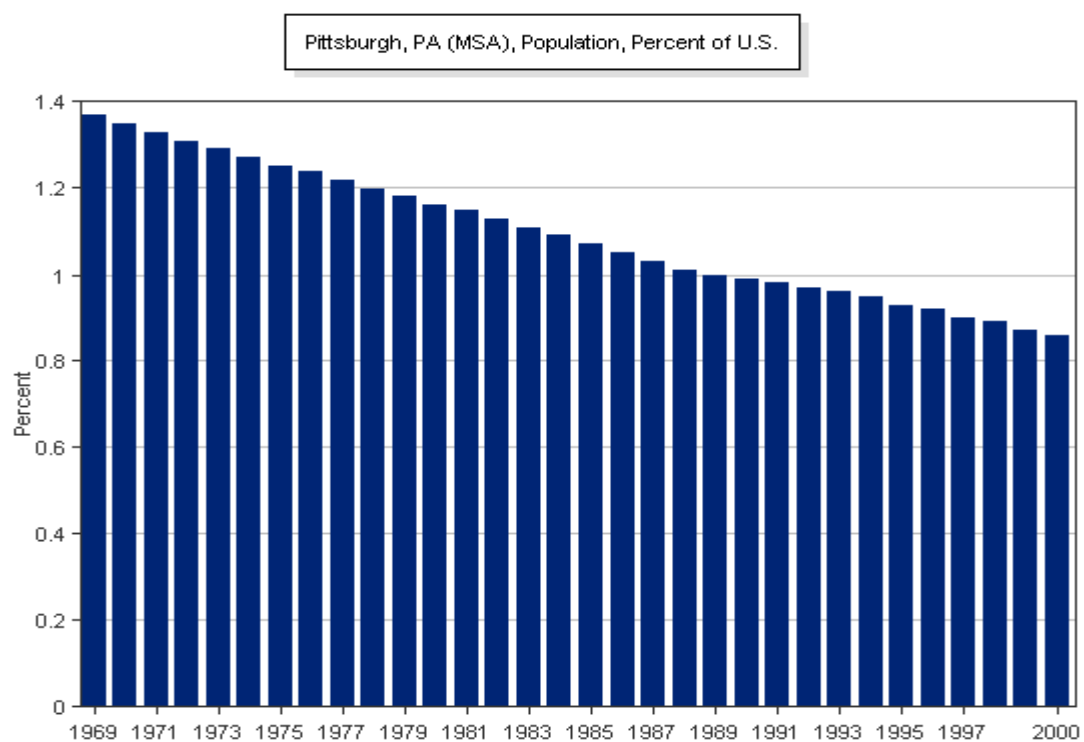


Source: U.S. Bureau of Economic Analysis⁴⁰

³⁹ A Vision of Britain Through Time:

http://www.visionofbritain.org.uk/data_rate_page.jsp?u_id=10076882&c_id=10001043&data_theme=T_WK&id=0 [accessed August 10, 2008].

⁴⁰ U.S. Bureau of Economic Analysis: http://www.bea.gov/regional/remdChart/default.cfm#chart_top [accessed August 5, 2008].



Source: U.S. Bureau of Economic Analysis⁴¹

⁴¹ U.S. Bureau of Economic Analysis: http://www.bea.gov/regional/remdChart/default.cfm#chart_top [accessed August 5, 2008].

NORTH AMERICA: Population of Major Cities (in thousands)

	1900	1910	1920	1930	1940	1940	1950	1950	1960	1960	1970	1970	1980	1980	1990	1990	1996	1996
Nashville (USA)	81	110	118	154	167	257	174	322	171 ¹⁸	597	448 ⁸	699	456	851	488	985 ²⁸	511	1,117
Newark, NJ (USA)	246	347	415	442	430	...	439	...	405	1,833	382	2,057	329	1,879	275	...	269 ²⁸	...
New Orleans (USA)	287	339	387	459	485	532	570	665	628	907	583	1,046	558	1,256	496	1,239	477	1,313
New York (USA)	3,437	4,767	6,620	7,455	8,707	7,892	9,586	7,782	9,340	7,885	9,974	7,072	8,275	7,322	18,087	7,381	19,388	...
Norfolk (USA)	47	67	116	130	144	259 ¹⁷	214	446 ¹⁷	305	629 ¹⁷	308	733 ¹⁷	267	1,160 ¹⁷	261	1,396	233	1,540
Oakland (USA)	67	150	216	284	302	244	385	18	388	566	382	699	339	861	372	956	387	1,027
Okahoma City (USA)	10	64	91	185	204	244	244	325	324	566	366	404	404	861	444	956	470 ¹⁸	1,027
Omaha (USA)	103	124 ¹⁹	192 ¹⁸	214	224	325	231	366	302	458	347	543	313	585	335	618	364	682 ²⁴
Ottawa (Canada)	60	87	108	127	155	226	202	292	268	430	302	603	295	718	313	920	...	1,057
Panama City	...	38	67	74	112	...	128	...	273	...	349	...	386	...	584	...	471 ²⁴	...
Paterson, NJ (USA)	105	126	136	139	140	139	...	...	144	407 ²⁰	145	461 ²⁰	138	...	140	...	150	...
Philadelphia (USA)	1,294	1,549	1,824	1,951	1,931	3,200	2,072	3,671	2,003	4,343	1,949	4,824	1,688	4,717	1,585	5,899	1,478	5,973
Phoenix (USA)	6	11	29	48	65	186	107	332	439	684	582	969	790	1,509	983	2,122	1,159	2,747
Pittsburgh (USA) ²	452	534	588	670	672	2,083	677	2,213	604	2,405	520	2,401	424	2,219	386	2,406	380	2,379
Port-au-Prince (Haiti)	70	105	...	100	115	...	134	...	240	...	459	494	450	763	690	1,255 ²⁸	991	...
Portland, Oreg. (USA)	90	207	258	302	305	501	374	705	373	822	383	1,007	368	1,288	437	1,477	481	2,078
Providence, RI (USA)	176	224	238	253	254	677 ²⁰	249	737 ²⁰	207	821 ¹¹	179	909 ²¹	157	926 ²¹	160	1,141	153	1,124
Puebla (Mexico)	94	96	96	123	138	...	211	...	289	...	402	...	773	...	1,057	...	...	687 ²⁴
Quebec (Canada)	69	78	95	131	151	225	164	275	172	358	186	481	166	576	167	645	...	...
Richmond, Va. (USA)	85	128	172	183	193	263	230	328	220	457	250	542	219	761	203	865	198	935
Rochester (USA)	163	218	286	328	325	438	332	488	319	801	296	962	242	971	231	1,002	222	1,088
Sacramento (USA)	29	45	66	86	85	170	138	277	192	626	254	804	276	1,100	369	1,481	376	1,632
St Louis (USA)	575	687	773	822	816	1,432	857	1,881	750	2,144	622	2,411	453	2,377	396	2,444	352	2,548
St Paul, Minn. (USA)	163	215	235	272	288	15	311	...	313	...	310	...	270	...	272	...	...	...
St Petersburg (USA)	2	4	14	40	61	22	97	...	181	...	216	...	239	...	238	...	236	...
Salt Lake City (USA)	54	93	118	140	150	212	182	275	189	576	176	705	163	960	159	1,072	173	1,218
San Antonio (USA)	53	97	161	232	254	338	408	500	588	736	654	888	786	1,072	935	1,302	1,409	...
San Bernardino (USA)	6	13	19	37	44	161 ¹³	63	282 ²⁸	92	1,003	104	1,141 ²³	876	1,558 ²³	164	...	183	...
San Diego (USA)	18	40	74	148	203	289	334	557	573	810 ²³	697	1,358	1,19	1,862	1,110	2,498	1,171	2,655
San Francisco (USA)	343	417	507	634	635	1,462 ¹⁸	775	2,241 ¹⁸	740	2,649 ¹⁸	716	3,107 ¹⁸	679	3,251 ¹⁸	723	6,253	735	6,605

Source: International Historical Statistics: The Americas 1750-2000.⁴²

⁴² B.R. Mitchell, International Historical Statistics: The Americas 1750-2000 (New York: Palgrave Macmillan, 2003).

Population of Major Cities (in thousands)

	circa	1750	1800/1	1850/1	1860/1	1870/1	1880/1	1890/1	1900/1	1910/1	1920/1	1930/1	1940/1	1950/1	1960/1	1970/1	1980/1	1990/1	2000/1
Palermo	118	139 ¹²	180	186	219	245	...	310	342	394	380	2,891	412 ²⁸	491 ¹⁶	588	651	700	714	679
Paris	576	581	1,053	1,686	1,852 ²²	2,269	2,448	2,714	2,888	2,907	2,980	2,830 ²⁸	2,850 ¹⁶	2,790 ¹⁶	2,489 ^{28/16}	2,189 ^{22/16}	2,152	2,148 ²⁸	
Perm (Molotov)	6	3 ¹¹	13	13	23 ²⁷	32	39	45 ²⁷	50	68	120 ²⁸	265	...	629 ²⁸	850	1,018	1,099	1,018 ²⁸	
Prague	59	75	118	143 ²⁷	157	162	184	202	224 ¹⁷	67 ¹⁷	849 ¹⁷	928 ²⁵	922 ²⁷	1,005	1,080	1,193	1,212	1,178	
Riga	16	30	70	77 ²⁸	102 ²⁷	160	196 ²⁸	256 ²⁷	331	285 ²²	378	393	...	560 ²⁸	732	850	909	806 ²⁸	
Rome ²⁸	156	163 ²⁸	175	184	244	300	...	463	542	692	1,008	1,156 ²⁸	1,552	2,188	2,800	2,831	2,828	2,856	
Rostov-on-Don	...	4 ¹¹	13	29 ²⁸	39 ²⁷	61 ²⁸	67 ²⁸	120 ²⁷	121	233	306 ²⁸	510	...	600 ²⁸	789	957	1,027	1,006 ²⁸	
Rotterdam	44	53	90	106	116	153	202	319	427	511	582	612	646 ¹⁶	729 ¹⁶	679 ¹⁶	579 ¹⁶	589	593	
Rouen	67	85	104	104	104	106	102	118	125	124	123	123 ²⁸	117 ^{28/25}	123 ^{22/25}	120 ^{28/25}	105 ^{22/25}	103	109 ²⁸	
Saïonika	45	62	75	...	...	...	...	115	158	170	...	225	217 ²⁸	251 ²⁸	346 ²⁸	406 ²⁸	406	...	
Saratov	8	27 ¹¹	62	84 ²⁸	93 ²⁷	80	123	137 ²⁷	206	189	220 ²⁸	376	...	581 ²⁸	757	873	889	879 ²⁸	
Seville	66	96	106	82 ²⁷	...	129 ²⁷	143 ²⁷	148	155	206	218	239	375	442	548	654	653	702 ²⁸	
Sheffield	12	31	135	185	240	285	324	409	465	512	518	522	513	494	539	539 ²⁸	520	513	
Sofia	...	...	...	...	19	21	42	68	103	154	287 ²⁸	401	435 ²⁸	687 ²⁸	877 ²⁸	1,057 ²⁸	1,220	1,192 ²⁸	
Stockholm	60	76	93	112	136	169	246	301	342	419	502	581	744 ²⁸	807 ²⁸	740 ²⁸	647 ²⁸	679	750	
Strasbourg	40	49	76	82	86	105	124	151	178	167	181	193 ²⁸	201 ²⁸	229 ²⁸	249 ²⁸	252 ²⁸	252	267 ²⁸	
Stuttgart	17	18	47 ²⁸	56	92	117	140	177	286	309 ¹⁹	415 ²⁸	460	498	638	633	582	584	581 ²⁸	
Szczecin (Stettin)	12	23	48 ²⁸	64	76	92	116	211	232	233 ¹⁹	271 ²⁸	269	159	269	337	388	413	417 ²⁸	
Toulouse	45	50	94	113	125 ²⁷	140	150	150	175	195	213 ²⁸	269 ²⁸	269 ²⁸	324 ²⁸	370 ²⁸	354 ²⁸	358	396 ²⁸	
Tiflis	...	30 ²⁸	35 ²⁸	61 ²⁸	61 ²⁷	90 ²⁸	101 ²⁸	161 ²⁷	188	327	294 ²⁸	519	...	695 ²⁸	889	1,095	1,300 ²⁸	1,310 ^{27/28}	
Turin	57	78	135	178	208	254	...	336	427	502	597	629 ²⁸	711	1,028	1,178	1,104	1,059	901	
Ula	...	9	13	17	20 ²⁷	26 ²⁸	30 ²⁸	50 ²⁷	103	93	99 ²⁸	248	...	547 ²⁸	771	1,009	1,097	1,096 ²⁸	
Valencia	60	80	90	87 ²⁷	...	138 ²⁷	171 ²⁷	214	233	244	275	451	508	505	654	752	719	739	
Vence	149	134 ²⁸	106	118 ²⁷	129	129	...	152	161	192	260 ²⁸	264 ²⁸	317 ²⁸	347 ²⁸	364 ²⁸	333 ²⁸	339	275	
Vienna	175	247	444	476 ²⁷	834	1,104	1,385	1,675	2,031	1,866 ²⁸	1,874 ²⁸	1,918	1,616	1,628	1,620	1,531	1,540	1,608	
Vologograd (Salingrad)	...	4 ¹¹	...	7	12	31	38 ²⁸	56 ²⁷	78	90	15 ²⁸	445	...	592 ²⁸	818	948	1,006	996 ²⁸	
Warsaw	23	100	160	163 ²⁸	252	339	454	638 ²⁷	872	931	1,179	1,266	601	1,138	1,308	1,586	1,654	1,618 ²⁸	
Wrocław (Breslau)	55	60	114	146	208	273	335	454	512	528 ¹⁹	625 ²⁸	615	279	429	523	618	643	638 ²⁸	
Wuppertal	4	16	80 ²⁸	106	146	189	242	299	339	393	408 ²⁸	398	363	421	419	394	384	371 ²⁸	
Zagreb (Agram)	...	13	14	17 ²⁷	20	28	38	61	79	108	186	...	321 ²⁸	488	574	650	704	1,047 ²⁸	
Zürich	11	12	17	20	57 ²⁷	79 ²⁷	94 ²⁷	151	191 ²⁷	207	250	336	390	440 ²⁸	423 ²⁸	370	342	337 ²⁸	

* = Suburbs included. Superior figure in italics show census dates where different. See p. 77 for footnotes

Source: International Historical Statistics: Europe 1750- 2000⁴³

⁴³ B.R. Mitchell, International Historical Statistics: Europe 1750- 2000 (New York: Palgrave Macmillan, 2003).

NORTH AMERICA: Economically Active Population by Major Industrial Groups (in thousands)¹

	Agriculture, Forestry & Fishing	Extractive Industry	Manufacturing Industry ²	Construction	Commerce, Finance, etc	Transport & Communica- tions	Services ³	Others Occupied
USA								1820-1995
Total								
1820	2,070 ¹⁰	...	350	...	...	...	...	460
1830	2,770 ¹⁰	...	...	...	...	...	...	1,160
1840	3,720 ¹⁰	15	790	...	...	...	...	895
1850	4,925	90	1,280 ²⁰	...	...	420 ²⁰	940	65
1860	6,260	170	1,930 ²⁰	...	...	780 ²⁰	1,310	80
1870	6,910 ₁₉	180 ₁₉	2,750 ²⁰ ₁₉	...	...	1,350 ²⁰ ₁₉	1,700 ₁₉	30 ₁₉
1880	6,490	200	2,250 ²⁰	750	830	640 ²⁰	1,620	140
1890	8,705	310	3,170 ²⁰	830	1,220	860 ²⁰	2,100	195
1890	10,170	480	4,750 ²⁰	1,440	1,990	1,530 ²⁰	3,210	170
1900	10,920	760	6,340 ²⁰	1,660	2,760	2,100 ²⁰	4,160	370
1910	11,590	1,050	8,230 ²⁰	2,300	3,890	3,190 ²⁰	5,880	600
1920	11,400	1,230	10,880 ²⁰	2,170	4,860	4,190 ²⁰	6,500	380
1930	10,750 ₁₉	1,150 ₁₉	10,990 ²⁰ ₁₉	3,030 ₁₉	7,450 ₁₉	4,850 ²⁰ ₁₉	9,280 ₁₉	1,340 ₁₉
Males								
1940	8,628	1,098	9,652	3,463	6,333	2,540	6,318	1,418
1950	6,568	947	12,192	3,661	8,350	3,186	7,801	1,015
1960	4,069	681	14,557	4,141	9,117	3,031	9,985	1,732
1970	3,040	494	16,750	4,972	11,097	3,262	14,503	—
1980	2,936	870	17,130	6,326	15,135	3,863	15,434	—
1990	2,807	647	15,069	7,758	19,792	4,743	15,762	—
1995	2,907	599	14,407	7,531	21,231	5,252	17,300	...
Females								
1940	513	12	2,674	46	2,154	300	6,232	634
1950	612	24	3,915	103	4,497	616	6,240	528
1960	450	33	4,898	162	5,915	684	9,075	1,115
1970	633	38	6,393	251	8,702	1,013	14,251	—
1980	729	133	7,843	527	14,589	1,427	19,027	—
1990	760	119	7,394	712	19,972	2,072	24,814	—
1995	955	108	6,926	765	20,804	2,246	27,783	...

Source: Source: International Historical Statistics: The Americas 1750-2000.⁴⁴

⁴⁴ B.R. Mitchell, International Historical Statistics: The Americas 1750-2000 (New York: Palgrave Macmillan, 2003).

Economically Active Population by Major Industrial Groups (in thousands) ¹							
U.K. (Great Britain)							
	Agriculture Forestry & Fishing	Extractive Industry	Manufacturing ² Industry	Construction	Commerce Finance etc	Transport & Communications	Services ³ Others Occupied
Males							
1841 ⁵⁰	1,458	218	1,816	376	94	196	474
1851	1,824	383	2,349	496	91	433	438
1861	1,818	457	2,609	593	130	579	511
1871	1,681	517	2,815	712	212	654	972
1881 ⁵¹	1,575	604	3,001	875	352	870	861
1891	1,475	751	3,460	899	449	1,104	1,009
1901	1,390	931	4,062	1,216	597	1,409	887
1911	1,489	1,202	4,688	1,140	739	1,571	741
1921	1,261	1,396	4,813	783	1,702	1,461	344
1931	1,181	1,272	4,958	1,108	2,314	1,563	137
1951	1,025	847	6,153	1,390	1,838	1,517	73
1961	777	728	6,308	1,597	2,066	1,486	135
1971	643	256	6,121	1,476	2,391	1,811	276
1981	425	334	4,631	1,478	2,496	1,465	98
1991	450	201	3,810	1,640	4,250	1,209	—
2001	305	104	3,596	1,858	5,132	1,512	104
Females							
1841 ⁵⁰	81	7	639	1	1	4	41
1851	230	11	1,263	1	—	13	75
1861	164	6	1,456	1	2	11	80
1871	136	11	1,541	4	5	16	106
1881 ⁵¹	119	8	1,685	2	11	15	78
1891	81	7	1,948	3	26	20	89
1901	86	6	2,123	3	76	27	75
1911	117	8	2,430	5	157	38	98
1921	111	14	2,187	12	863	109	75
1931	76	9	2,355	14	1,021	110	44
1951	117	14	2,654	41	1,322	217	36
1961	97	21	2,666	69	1,773	230	64
1971	97	5	1,505	182	3,561	453	375
1981	90	20	1,867	127	2,441	329	77
1991	119	22	1,587	165	4,339	337	—
2001	86	11	1,226	200	4,748	495	114

Source: International Historical Statistics: Europe 1750- 2000⁴⁵

⁴⁵ B.R. Mitchell, International Historical Statistics: Europe 1750- 2000 (New York: Palgrave Macmillan, 2003).

NORTH AMERICA: OUTPUT OF CRUDE STEEL (in thousands of metric tons)

	Canada	Cuba ²	Mexico ³	USA ¹
1970	11,198	140	3,846	119,309
1971	11,040	111	3,784	109,265
1972	11,859	187	4,396	120,875
1973	13,386	221	4,652	136,804
1974	13,623	250	5,046	132,196
1975	13,025	298	5,196	105,897
1976	13,290	250	5,243	116,121
1977	13,581	330	5,529	113,701
1978	14,898	324	6,712	124,314
1979	16,078	313	7,023	123,688
1980	15,901	292	7,003	101,456
1981	14,811	317	7,448	109,614
1982	11,871	290	6,926	67,656
1983	12,832	352	6,747	76,762
1984	14,699	325	7,293	83,940
1985	13,459	401	7,174	80,067
1986	14,081	412	6,960	74,032
1987	14,737	402	7,210	80,876
1988	15,193	321	7,311	90,631
1989	15,458	314	7,329	87,722
1990	12,281	270	8,221	89,726
1991	12,987	270	7,462	79,738
1992	13,924	200	7,848	84,322
1993	14,387	100	8,188	88,793
1994	13,897	131	8,690	91,200
1995	14,415	207	9,948	95,200
1996	14,735	231	9,852	95,500
1997	15,360	342	10,560	98,500

Output of Crude Steel (in thousands of metric tons)

1970-1998

	Lux'bg	Neth'l	Norway	Poland	Portugal	Romania	Russia ³ USSR	Spain	Sweden	Switz	U.K.	Yugo- slavia
1970	5,462	5,042	869	11,795	385	6,517	116	7,394	5,494	524	28,291	2,228
1971	5,241	5,083	885	12,738	409	6,803	121	7,794	5,263	532	24,153	2,453
1972	5,457	5,585	918	13,476	431	7,401	126	9,564	5,248	543	25,293	2,588
1973	5,294	5,625	950	14,057	497	8,161	131	10,809	5,651	584	26,594	2,676
1974	6,448	5,840	956	14,565	357	8,840	136	11,646	5,972	593	22,323	2,836
1975	4,625	4,822	907	15,004	384	9,549	141	11,115	5,613	420	20,098	2,916
1976	4,566	5,190	909	15,639	389	10,733	145	11,085	5,168	545	22,274	2,757
1977	4,329	4,927	711	17,841	341	11,457	147	11,270	3,953	656	20,411	2,377
1978	4,791	5,591	812	19,257	366	11,779	151	11,469	4,314	651	20,311	3,454
1979	4,954	5,805	911	19,218	411 ^{1a}	12,909	149	12,254	4,643	886	21,464	3,537
1980	4,624	5,271	866	19,485	663	13,176	148	12,553	4,231	929	11,277	3,634
1981	3,790	5,472	847	15,719	555	13,005	148	13,020	3,795	934	15,573	3,977
1982	3,510	4,354	768	14,795	602	13,055	147	13,449	3,946	835	13,704	3,840
1983	3,294	4,484	895	16,236	674	12,593	153	13,262	4,204	835	14,986	4,134
1984	3,987	5,739	920	16,533	690	14,437	154	13,379	4,674	978	15,121	4,244
1985	3,945	5,517	930	16,126	665	13,795	155	14,679	4,851	987	15,722	4,338
1986	3,705	5,283	836	17,144	717	14,276	161	11,905	4,719	1,075	14,725	4,565
1987	3,302	5,082	837	17,145	750	13,885	162	11,691	4,683	866	17,414	4,476
1988	3,661	5,518	869	16,873	832	14,314	163	11,886	4,779	988	18,950	4,584
1989	3,720	5,676	670	15,096	761	14,411	160	12,397	4,480	1,064	18,744	4,500
1990	3,480	5,408	368	13,644	717	9,761	154	12,658	4,452	1,105	16,464	3,576
1991	3,384	5,168	431	10,440	547	7,130	73 ²¹	12,700	4,236	955	16,632	...
1992	3,072	5,437	440	9,864	749	5,376	62 ²¹	12,161	4,416	1,050	16,008	87 ²²
1993	3,288	6,000	501	9,936	775	5,446	54 ²¹	12,058	4,596	1,260	16,464	...
1994	3,073	6,172	456	11,112	744	5,943	48,812	13,440	4,956	1,100	17,286	...
1995	2,613	6,409	503	11,892	828	6,697	51,590	13,932	4,920	850	17,604	...
1996	2,501	6,326	511	10,668	871	6,216	49,253	12,166	4,908	750	17,992	...
1997	2,580	6,641	564	11,592	905	6,790	48,502	13,677	5,148	1,000	18,510	...
1998	2,477	6,377	639	9,916	854	6,405	43,673	14,819	5,172	1,000	11,681	...

Sources: Source: International Historical Statistics: The Americas 1750-2000⁴⁶ and International Historical Statistics: Europe 1750- 2000⁴⁷

⁴⁶ B.R. Mitchell, International Historical Statistics: The Americas 1750-2000 (New York: Palgrave Macmillan, 2003).

⁴⁷ B.R. Mitchell, International Historical Statistics: Europe 1750- 2000 (New York: Palgrave Macmillan, 2003).

V. Theoretical Perspectives: Economic Cycles and the Steel Industry

Some economists and economic historians have argued that the previously described changes of the global economy and steel industry can be explained by economic cycles theory and research. There are several types of economic cycle theories. However, this thesis will focus on Kondratiev or long waves- perhaps the most interesting when applied to the discussion at hand. The theory is used by two differing schools of economic thought and is a useful tool in not only periodizing the decline of Pittsburgh and Sheffield's steel-based economies, but also understanding the significant relationship between technological changes and societal/economic structure.

In 1925, the USSR economist Nikolai Kondratiev (of whom the waves are named after) published a book entitled *The Major Economic Cycles*, which argued that the modern global economy experiences extended, alternating high and slow growth cycles of approximately fifty years.⁴⁸ Kondratiev's observation inspired the work of Schumpeter in the struggling 1930s and several Marxist scholars in the more economically prosperous 1960s. Schumpeter and his colleagues focused on "the central role of technical progress, in providing opportunities for profits and accumulation" and held that upspring periods were facilitated by the emergence of a cluster of key innovations.⁴⁹ Gerhard Mensch went on further to hypothesize that such clusters emerge because "depressions make entrepreneurs more adventurous" and willing to experiment and take risks with their innovations.⁵⁰ Prominent Marxist scholars, such as Ernest Mandel,

⁴⁸ Chris Freeman and Francisco Louca, *As Time Goes By: From the Industrial Revolutions to the Information Revolution* (Oxford: Oxford University Press, 2001) 67-70.

⁴⁹ Andrew Tylecote, *The Long Wave in the World Economy: The Present Crisis in Historical Perspective* (London: Routledge, 1991), 14-15.

⁵⁰ Tylecote, *The Long Wave in the World Economy: The Present Crisis in Historical Perspective*, 15.

argue that “long waves occur because of the inherent tendency in capitalism for the rate of profit to fall”.⁵¹ Additionally, they argue that exogenous factors such as “imperial expansion, the discovery of new natural resources, or the suppression of labour movements” are what allow recovery to occur.⁵² Kondratiev or long waves has been met with skepticism by many current mainstream economists. Amongst other criticisms, critics argue that several historical economic events were not inevitable, as wave theory may suggest, and that Kondratiev selectively excluded data that did not prove his theory. Regardless of these criticisms, the conception of long waves remains useful when periodizing and organizing economic history.

Scholars envision that five Kondratiev waves have occurred in modern history. These periods can be summarized briefly as The British Industrial Revolution: The Age of Cotton, Iron, and Water Power, beginning in the 1770s; The Second Kondratiev Wave: The Age of Iron Railways, Steam Power, and Mechanization, beginning in 1829; The Third Kondratiev Wave: The Age of Steel, Heavy Engineering, and Electrification beginning in 1875; The Fourth Kondratiev Wave: The Great Depression and the Age of Oil, Automobiles and Mass Production beginning in 1908; The Fifth Kondratiev Wave: The Age of Information and Communication Technology (ICT), beginning in 1971.⁵³

Long wave enthusiasts hold that “economic growth as we have experienced it needs to be understood in terms of a sequence of eras”. Furthermore, “each era is marked by a cluster of technologies, whose progressive development drives experienced economic growth”.⁵⁴ Such

⁵¹ Mumatz Keklik, *Schumpeter, Innovation, and Growth: Long-cycle dynamics in the post-WWII American Manufacturing Industries* (Burlington: Ashgate Publishing Company, 2003) 53-54.

⁵² Keklik, *Schumpeter, Innovation, and Growth: Long-cycle dynamics in the post-WWII American Manufacturing Industries*, 53.

⁵³ Chris Freeman and Francisco Louca, *As Time Goes By: From the Industrial Revolution to the Information Revolution* (Oxford: Oxford University Press, 2001) 153- 335.

⁵⁴ Freeman and Louca, *As Time Goes By: From the Industrial Revolution to the Information Revolution*

broad generalizations beg the question as to why some countries dominate economically during a wave, while others lose economic power or fail to participate. One explanation “why certain countries have been the leaders in different economic eras is that the various subsystems there fit together better to provide a supporting overall structure for the key technologies than was the case of institutions in other countries”.⁵⁵ This provides a reason for why changes in technological eras often coincide with shifts in global economic power. Immanuel Wallerstein examines such subsystems and shifts in power when discussing the economic hegemony of the United States in the mid-twentieth century.⁵⁶ According to Wallerstein, the root of United States’ hegemony was its “ability... in the postwar period to produce efficiently, cheaply, and with quality and therefore outsell other major industrial producers even in the home markets”.⁵⁷

This ability decreased starting in the 1960s as world political conditions changed and transport and communication costs decreased.⁵⁸ Countries which had previously been consumers of American products like steel, began to produce their own products and, later, export to the United States. These products were made with newer technologies, cheaper labour costs, and/or more efficient machines. In an effort to lower costs and maximize profit, many multinational corporations intentionally shifted their steel purchases or related manufacturing to “so-called newly industrializing countries...in which the workforce receives less remuneration.”⁵⁹ There was a great shift in the location of steel production:

In 1900, the USA was producing 37% of the world’s steel. With post war industrial development in Asia that region now (at the turn of the century) accounts for almost

⁵⁵ *Freeman and Louca*, vii.

⁵⁶ Samir Amin et al., *Dynamics of Global Crisis* (London: The Macmillian Press, Inc., 1982) 38-41.

⁵⁷ Amin et al., *Dynamics of Global Crisis*, 39.

⁵⁸ Amin et al., 40.

⁵⁹ Amin et al., 39.

40%, with Europe (including the former Soviet Union) producing 36% and North America 14.5%.⁶⁰

Employment in the steel industry 1974, 1990 and 1996-2000 ⁶¹

Thousand at end of year

(1) Includes former German Democratic Republic 1996-2000 (2) Serbia and Montenegro 1996-2000 Totals are rounded. United States figures are average for 12 months. Various other differences in coverage and definition exist, so that inter-country comparisons are of dubious value. E indicates estimate.

Country	1974	1990	1996	1997	1998	1999	2000
Austria	44	21	13	12	12	12	12
Belgium	64	26	23	21	20	20	20
Denmark	2	1	1	1	1	1	1
Finland	12	10	7	7	8	7	8
France	158	46	39	38	38	38	39
FR Germany (1)	232	125	86	82	80	78	77
Greece	0	3	2	2	2	2	2
Ireland	1	1	0	0	0	0	0
Italy	96	56	39	37	39	39	39
Luxembourg	23	9	5	5	4	4	4
Netherlands	25	17	12	12	12	12	12
Portugal	4	4	2	2	2	2	2
Spain	89	36	24	23	22	22	22
Sweden	50	26	14	14	14	13	13
United Kingdom	197	51	37	36	34	31	29
European Union	996	434	306	293	290	280	278
Yugoslavia (2)	42	69	17	17	17	15	15E
Canada	77	53	53	53	55	57	56
United States	521	204	167	163	160	153	151
Brazil	118	115	79	74	63	59	63
South Africa	100	112	71	70	61	54	47
Japan	459	305	240	230	221	208	197
Republic of Korea	n/a	67	66	64	59	58	57
Australia	42	30	21	20	20	24	21E
Total of above	2335	1388	1019	985	946	908	885

Pittsburgh and Sheffield were also greatly affected by the changing demand for steel throughout the twentieth century. In particular, periods of industrialization and post-war reconstruction created huge surges in steel demand and production. The demand for steel “strongly reflects major economic forces, as well as major political upheavals”.⁶² Demand for steel tends to “increase when economies are growing [and] as governments invest in infrastructure and

⁶⁰ Statemaster Statistics Encyclopedia, <http://www.statemaster.com/encyclopedia/Global-steel-industry-trends#Reduction in workforce>, Accessed on September 15, 2012.

⁶¹ <http://www.statemaster.com/encyclopedia/Global-steel-industry-trends#Reduction in workforce>, accessed September 12, 2009.

⁶² Ibid.

transport and build new factories and houses”.⁶³ The steel boom of post World II represents this trend. Additionally, when economies go into recession, there also tends to be a similar “dip in steel production as such investments falter”.⁶⁴ The 1970s was a period of economic decline for the UK and the US. During this period, the intense demands for steel subsided, steel production followed in suit.

However, this is not to suggest that demand for steel remained in permanent decline. Economic cycles theory argues only that there are high and low periods of economic activity and steel demand. The use of steel has been on a general incline, from “28 million tons at the beginning of the 20th century to 780 million tons” by the year 2000.⁶⁵ This trend suggests the long term decline of the Pittsburgh and Sheffield steel industries was not due simply to a temporary decrease in demand. Rather, several factors, as previously discussed, converged simultaneously on the unprepared economies of Pittsburgh and Sheffield. Global changes in steel production and demand, as well as the introduction of new technological paradigm (information and communication technology) rendered many of Pittsburgh and Sheffield’s institutions economically obsolete.

⁶³ Ibid.

⁶⁴ Ibid.

⁶⁵ Ibid.

VI. Key Features of the Steel Manufacturing Economy and its Effects on the Cities' Structures

The present economic challenges of Pittsburgh and Sheffield are highly connected to their past identities as “Steel Cities”. The cities grew with their steel industries, and a deeply intertwined relationship developed between the steel manufacturing industry and the formation of the cities and their institutions.

Geography played an important role in the development of the traditional, manufacturing economy. Like other manufacturing industries, steel required certain topographical features and natural resources for its production. This need influenced the industry's location decisions. The city's other inherent geographical qualities, such as its level of connectivity to other regional hubs, helped determine the availability of other business and cultural resources. Additionally, the simultaneous growth of steel manufacture and the cities of Pittsburgh and Sheffield influenced the spatial and economic organization of the cities. Together, these characteristics comprised a city structure whose logic was heavily dependent on the industry which helped build it.

a. Sheffield's Natural Features and the Beginnings of its Steel Industry

Sheffield is located in the metropolitan county of South Yorkshire in Northern England. The region's natural resources provided the early iron and steel industries with several key inputs; “deep wood valleys provided charcoal for smelting, fuel for forges,... exposed hill brows [for]...smelting sites, and...sandstones [for] excellent grindstones”.⁶⁶ Famed Sheffield historian, Sidney Pollard, recounts that the town was “built on a number of steep slopes, descending from the spurs of the high moors to the west and north towards sharply defined valleys and their

⁶⁶ David L. Linton, Sheffield and Its Region: A Scientific and Historical Survey (Sheffield: British Association by the Local Executive Committee, 1956) xx.

rivers, on which so much of Sheffield's industrial history depends".⁶⁷ The sharp valleys into which the rivers descended were responsible for the consistent waterfalls and rapids that attracted Sheffield's first industry, cutlery manufacturing. According to the 1956 Scientific and Historical survey of Sheffield, "the abundance of water-power and its relative cheapness... favoured the localization of the cutlery trades in the Sheffield region" and promoted the formation of a cluster of highly skilled and specialized metal craft workers.⁶⁸ Although early cutlery firms were small in number of employees and product produced, "their aggregate demand for the raw material of their trades was [an] important...reason for the rise of the steel industry and its expansion in this area."⁶⁹ The hilly terrain and lack of navigable rivers kept early Sheffield in relative isolation and cut off from wider trade.⁷⁰ Local demand for raw materials fueled the early growth of the steel industry.⁷¹

The natural physical features of Sheffield helped attract and grow its steel industry, but the geographic isolation of the region prevented Sheffield from developing an economic base wider than the production of steel and cutlery.⁷² The region's adaptation to its geography caused demand for improved transport and communications to be considerably delayed.⁷³ As late as the

⁶⁷ Sidney Pollard, A History of Labour in Sheffield (Liverpool: Liverpool University Press, 1959), 3.

⁶⁸ G.P. Jones, "Industrial Evolution", Sheffield and Its Region: A Scientific and Historical Survey, ed. David L. Linton (Sheffield: British Association by the Local Executive Committee, 1956) 160.

⁶⁹ Ibid.

⁷⁰ David Hey, Packmen, Carriers and Packhorse Roads (Leicester: Leicester University Press, 1980) 12-30.

⁷¹ Geoffrey Tweedale, "Steelmakers as Masters Cutler: A Look at a Sheffield Industrial Elite", Mesters to Masters: A History of the Company of Cutlers in Hallamshire, ed. Clyde Binfield and David Hey (Oxford: Oxford University Press, 1997), 63-84.

⁷² Lars Magnusson, The Contest for Control: Metal Industries in Sheffield, Solingen, Remscheid and Eskilstuna during Industrialization (Oxford: Berg Publishers, 1994) 44-50.

⁷³ The cutlery trade was able to grow thanks to the growth of local steel production. Additionally, cutlery developed as the early industry of Sheffield partly because of its portability. Caravans of pack horses would traverse the rough terrain of Sheffield and carry the goods to other regional markets.

18th century, the importance of its trade outside the immediate region was characterized as “inconsiderable, confined, and precarious” due to the considerable efforts required to reach the city; it was approximately at this time, when towns such as Manchester were booming, that the dismal condition of Sheffield’s transportation was “realized to be a serious handicap”.⁷⁴

By the end of the 19th century, the city “appeared to have overcome disadvantages of its position.”⁷⁵ But despite the creation of better transport services, the early years of Sheffield isolation proved to be a determining force in the path of the city’s development. During the years Sheffield remained cordoned off from the greater part of British commerce and politics, other regional cities had expanded and developed expertise in key areas. Although Sheffield was conferred city status in 1893, it was (and is still) unable to “rival the financial and commercial facilities of cities like Leeds, Manchester, and Nottingham which have been centres of trade for wide regions [for well over]...two centuries”.⁷⁶ In addition to lacking the aptitude to be a trade-powerhouse, the previously isolated Sheffield did not have the “administrative, legal, and clerical” gravitas that many of the older towns like Lincoln and York possessed.⁷⁷

b. Pittsburgh’s Natural Features and the Beginnings of its Steel Industry

Pittsburgh is located in Allegheny County and is a part of Pennsylvania State, in the Midwestern region of the United States. In many senses, the topography of Pittsburgh echoes that of Sheffield. Like Sheffield, Pittsburgh is in the center of a region characterized by rivers, valleys, and slopes. In contrast to the geographic isolation of Sheffield, however, Pittsburgh was first

⁷⁴ A.W. Goodfellow, “The Development of Communications”, Sheffield and Its Region: A Scientific and Historical Survey, ed. David L. Linton (Sheffield: British Association by the Local Executive Committee, 1956) 161.

⁷⁵ A.W. Goodfellow, “The Development of Communications”, Sheffield and Its Region: A Scientific and Historical Survey, ed. David L. Linton, 167.

⁷⁶ David L. Linton, Sheffield and Its Region: A Scientific and Historical Survey, xxii

⁷⁷ *Ibid.*

settled and developed because of its excellent, navigable rivers. Captain William Trent, of the Virginia militia, laid out the first plans for a fort when his company came upon the site on February 17, 1754. The land was fought over by British and French forces, until it came under American Brigadier General John Forbes in 1758; it was renamed 'Fort Pitt'.⁷⁸ The "navigability of the two rivers, the Allegheny and the Monogahel, which converge at Pittsburgh to form the Ohio, ha[s] been generally recognized as...[a key] determinant of the...major industry of the region": steel.⁷⁹ Before the Civil War and the age of steel, "the region served as a major trade entrepot for markets to the west and south. Ready access to raw materials such as coal and timber soon fostered industrial activity: iron-smelting, metals fabrication, textiles, boat building, and the manufacture of glass stone-clay products."⁸⁰ With the rise of the railroad, Pittsburgh found the "locational advantage" of its trading market obsolete as water trade became less relevant to the ever westward-expanding nation. Instead, the city "responded with a maximum exploitation of its competitive superiority in raw materials (notably mineral fuels) needed for heavy industry".⁸¹

According to Pittsburgh scholar, Roy Lubove, the "Pittsburgh region's preeminence in iron and steel production after the 1880's was inseparable from the adoption of coke as the chief iron-smelting fuel."⁸² Unlike other cities eager to enter the booming manufacturing sector, Pittsburgh offered its industrialists and their factories close proximity to the nearby Connellsville coke

⁷⁸ Lowry, Ira and the Pittsburgh Regional Planning Association, "Portrait of a Region", Economic Study of the Pittsburgh Region, Vol. 2 (Pittsburgh: University of Pittsburgh Press, 1963) 4.

⁷⁹ Phillip Klein, A Social Study of Pittsburgh (Columbia University Press: New York, 1938) 39.

⁸⁰ Roy Lubove, Twentieth- Century Pittsburgh: Government, Business, and Environmental Change, 4.

⁸¹ Ibid.

⁸² Ibid. Coke is a fuel that is created by distilling coal. The Pittsburgh region was rich in coal mines that were well suited to coke production.

fields, “whose beehive ovens produced the best metallurgical coke in the United States.”⁸³ The Connellsville coke fields’ short distance from Pittsburgh allowed iron and steel manufacturers to maintain low coke transport costs and, consequently, iron and steel prices that were unbeatable. Only with the 20th century invention of the by-product coke ovens, which were cheaper “when situated near the furnaces rather than the mines,” did the Pittsburgh region lose its locational comparative advantage.⁸⁴

The early industry and natural resources of Pittsburgh attracted and fostered the dominance of the steel industry in the region. However, Pittsburgh’s development as a regional hub was not stunted by its geography. Although Pittsburgh’s economy was centered on steel, its history as a regional trading post also caused corporations like Heinz and Alcoa to base their operations in Pittsburgh. By the second half of the twentieth century, Pittsburgh was a highly desired location for Fortune 500 companies in the United States.⁸⁵ Additionally, the presence of wealthy corporate leaders may have increase the likelihood of philanthropy in the city.⁸⁶ Pittsburgh’s steel magnate Andrew Carnegie and his heirs created multiple charitable entities, museums, and educational institutions.⁸⁷ The prestigious Carnegie Mellon University was initially started by Andrew Carnegie. The city benefited from its business connections by receiving a significant amount of philanthropy.

⁸³ Ibid.

⁸⁴ Ibid.

⁸⁵ Robert E. Gleeson and Jerry Paytas, “Pittsburgh: Economic Restructuring and Regional Development Patterns, 1880-2000,” Sunbelt/Frostbelt: Public Policies and Market Forces in Metropolitan Development, ed. Janet Rothenberg Pack, 192.

⁸⁶ Martha Baum and Pamela Twiss, Social Work Intervention in an Economic Crisis: The River Communities Project (New York: The Haworth Press, 1996) 4.

⁸⁷ Edward K. Muller, “Downtown Pittsburgh”, Pittsburgh and the Appalachians: Cultural and Natural Resources I a Postindustrial Age (Pittsburgh: University of Pittsburgh Press, 2006) 11.

c. The Effect of Steel on the Spatial and Economic Organization of Cities

While the natural topography and resources of the regions influenced the early formation of their steel industries, steel production in turn affected the spatial composition of the Pittsburgh and Sheffield regions. The steel mills “required flat land, abundant water supplies, and good transport facilities”.⁸⁸ In Sheffield, the metal-working industry had claimed the flat land near the center of the city at an earlier date. As there was no suitable land left available near the center, the steelworks built their mills to the east of Sheffield. This area is called the Don Valley, and it “offered [the steel mills]...unlimited opportunities for industry and canal construction”.⁸⁹ In Pittsburgh, the prolific amount of hills and valleys meant that flat land near the river was also a rare commodity. Steel factories were quickly built along the scarce flat land, leaving little land for workers’ housing.

During the Second Industrial Revolution, between 1880 and 1920, steel demand dramatically increased. This increase caused the industrial capacity and population of the America’s ‘Steel City’ to soar.⁹⁰ In addition to greater demand, the extensive mergers of the 1890s and 1900s “created unprecedented concentrations of corporate capital”. These mergers “allowed steel companies to exploit new minimum efficiencies of scale in production by building new facilities that dwarfed the region’s early iron mill sites”.⁹¹ The geographical limits put on the expansion of towns along the river “induced the industrialists of Pittsburgh to seek other locations for plants, thereby starting a half century of industrial development in the natural valleys which crisscross

⁸⁸ A.J. Hunt, “The Morphology and Growth of Sheffield”, Sheffield and Its Region: A Scientific and Historical Survey, ed. David L. Linton (Sheffield: British Association by the Local Executive Committee, 1956) 234.

⁸⁹ Ibid.

⁹⁰ Phillip Klein, A Social Study of Pittsburgh, 42.

⁹¹ Gleeson and Paytas, 183.

the county.”⁹² Reacting to the steel boom, Sheffield’s mills also expanded further along the prized flat land bordering the river, leading construction of new mill further away from the center of the town.

By expanding along rivers that led outside the city center, steel manufacturing caused Sheffield and Pittsburgh to develop a suburbanized spatial pattern that lacked a densely populated core. By the late 1800s, Sheffield’s “eastern townships of Brightside and Attercliffe, [located outside the city center], experienced rapid growth because of the expansion of heavy industries.”⁹³ In the early twentieth century, the “exodus from the central part of Sheffield outward to the suburban areas lying to the south, west, and north” continued.⁹⁴ As a general trend, “outlying areas gained inhabitants, while the central section suffered a loss in population”.⁹⁵

Up until approximately 1880, the Pittsburgh region was characterized by a “dense, urban core inside the city...and a series of small river towns.”⁹⁶ After this date, “population in [Allegheny] county outside Pittsburgh...[began] increasing faster than that in city”. This was “in spite of the fact that the Pittsburgh population...[was] increased by successive annexations from the county.”⁹⁷ By the 1930s, in “population of county area outside the large city, Allegheny rank[ed] second only to Los Angeles County.”⁹⁸ Pittsburgh suburbanized well before the popular suburban movement of post- World War II. By 1960, the city had met “much of the initial

⁹² Klein, 42. Floodplains along the river beds were the only flat areas large enough to accommodate the newly enlarged factories.

⁹³ Hubert Dale Abadie, “Sheffield Politics, 1885-1910: Organization, Ideology and Political Behavior” (Ph.D. thesis, University of California, Los Angeles, 1971) 13.

⁹⁴ Abadie, “Sheffield Politics, 1885-1910: Organization, Ideology and Political Behavior”, 14.

⁹⁵ Ibid.

⁹⁶ Gleeson and Paytas, 183

⁹⁷ Klein 45.

⁹⁸ Ibid.

‘demand’ for suburbanization...[and] sixty-three percent of the population resided outside the central city”.⁹⁹ Pittsburgh became increasingly devoid of a dense, well-connected core and economically intertwined with the industrial geography of steel manufacturing.

Poor conditions in steel mill towns may have also encouraged suburbanization. The individual mill town was extremely dense in population and suffering from poor urban planning. In Jeff Kleinberg’s book entitled “The Shadow of the Mills”, he recounts that:

as industry required more land, families of the millworkers...squeezed into the remnants, interspersed with the works or perched onto the hillsides above them. Pittsburgh’s topography complicated workers’ housing: the steep hills placed a premium on flat land for industrial development, and industrial expansion left little room for dwellings. Thus mills preempted prime building land, leading one steelworker to believe that laboring families paid high rents for poor accommodations because “the available building ground except in the elevated portions is all occupied”.¹⁰⁰

Density of population varied significantly between “the industrial and nonindustrial sections of the city and the richer and poorer wards”.¹⁰¹ For example, the Hill district of Pittsburgh, which housed a large portion of the city’s African American population, boasted a density of 137.3 people per acre in 1890. This is in contrast to the middle to upper class Fourth Ward district, which remained three times less dense.¹⁰² Housing for the working class failed to improve, despite calls from labour advocates. Company housing was rare, and leaders viewed such concerns as out of their purview.¹⁰³

⁹⁹ Gleeson and Paytas, 185.

¹⁰⁰ S.J. Kleinberg, The Shadow of the Mills: Working-class Families in Pittsburgh, 1870-1907 (Pittsburgh: University of Pittsburgh Press, 1989), 68.

¹⁰¹ Kleinburg, *The Shadow of the Mills: Working-Class Families in Pittsburgh*, 67.

¹⁰² Kleinburg, 67.

¹⁰³ Kleinburg, 76.

In addition to cramped quarters, residents of Sheffield and Pittsburgh's teeming mill towns were subjected to incredibly poor air quality. The by-products from the mills created large quantities of smog and soot-filled air which became trapped in the valleys where workers homes were situated. "Dirt and noise were inseparable adjuncts to life in a mill district" and local residents suffered from high rates of diseases like pneumonia.¹⁰⁴ The poor living conditions, accentuated by the placement of the mills in valleys, probably served as "special impetus...[to] the suburban trend". Oftentimes, the smoke and fog of the steel mills and river valleys...[could] be escaped by going a few miles distant into the higher land."¹⁰⁵

This process of regional fragmentation was particularly harsh in Pittsburgh. The expansion of mills into the river valleys, created a fragmented, pinwheel-shaped city- a spatial pattern which still exists today.¹⁰⁶ This had several effects on the region. First, the spatial pattern resulted in isolated pockets of populations. In contrast to a dense core, the pinwheel pattern placed mills along winding rivers and between tall hills, essentially isolating populations by jurisdictional and topographic barriers. In terms of constructing infrastructure, it was easier to build roads radiating from the downtown to the individual mill towns than invest in the construction of "circumferential connections" that would better unite the separated towns.¹⁰⁷

d. Over-specialization of the Economy

The final feature of the steel manufacturing economy is the cities' overspecialization in the industry and their subsequent dependence on the sector. Although their regional econom[ies]

¹⁰⁴ Kleinburg, 65, 98.

¹⁰⁵ Klein, 44.

¹⁰⁶ The idea of a decentralized, pinwheel pattern comes from Robert E. Gleeson's "Pittsburgh: Economic Restructuring and Regional Development Patterns.

¹⁰⁷ Gleeson and Paytas, 185.

had once been quite balanced,” Pittsburgh and Sheffield came to be dominated by steel.¹⁰⁸ As early as the 1900s, Pittsburgh “had developed an economic mix that distinguished it from most other metropolitan areas- an overspecialization in a limited labour force in large plants associated with its specialties”.¹⁰⁹ This over-specialization had several lasting effects on the Pittsburgh region and its structure. First, large segments of the population became economically dependent on a single industry and, in the case of mill towns, a single factory. Second, the population became increasingly segregated by class, immigration-status, and ethnicity. As the industry expanded, it was able to create greater divisions of labour. Additionally, “technological innovation...reduced both costs and the industry’s dependence upon skilled labour”.¹¹⁰ Consequently, it became easier to divide the “labour force between skilled and unskilled” as the numbers of unskilled workers greatly increased.¹¹¹ Combined with Pittsburgh’s high levels of immigration, this led to a highly fragmented region with alternating sections of prosperity and poverty.¹¹² Immigrants filled many of the unskilled positions, while being given little opportunity by the mill for upward mobility. Owners and managers believed that “ethnic segregation in the mills was ‘quite natural’” and it helped discourage the formation of united labour unions or advocacy groups.¹¹³ Sheffield’s economy also became overspecialized and highly dependent on steel. It followed many of the same economic trends, but experienced little ethnic tension

¹⁰⁸ Lubove, 4.

¹⁰⁹ Lubove, 5.

¹¹⁰ Ibid.

¹¹¹ Ibid.

¹¹² Gleeson and Paytas, 184-186.

¹¹³ Kleinburg, 16.

because of the homogenizing effect of its geographical isolation.¹¹⁴ Sheffield did not experience significant immigration till the 1970s wave of Asian immigration. However, there was conflict between skilled and semi-skilled or unskilled workers because of the technological changes in the industry. Improvements in technology made many skilled and semi-skilled jobs unnecessary, allowing companies to pay lower wages to unskilled workers.¹¹⁵ The power of Sheffield's prominent skilled labour unions began to be challenged as companies hired greater numbers of unskilled, non-unionized workers.

The industrial geography of the steel industry and its effects on the spatial and economic organization of Pittsburgh and Sheffield caused the cities to develop an overspecialized and dependent relationship with steel manufacturing. When steel industry employment later declined, it would leave both cities with a structure devoid of its unifying thread.

¹¹⁴ Barry A. Kosmin; Marzy Bauer; Nigel Grizzard, Steel City Jews: A Study of Ethnicity and Social Mobility in the Jewish Population of the City of Sheffield, South Yorkshire, Ed. Research Unit Board of Deputies of British Jews (Cambridge: Cambridge Instantprint Limited, 1976) 1-28.

¹¹⁵ Francis Couvares, The Remaking of Pittsburgh (Albany: State University of New York Press, 1984) 83-95.

VII. The Effects of Steel Subsidies

By the time their steel industries began to show signs of decline in the late 1960s, Pittsburgh and Sheffield were structurally intertwined with their steel production. Recognizing this fact, policy makers were eager to preserve the industry. Hoping that their local steel industries would recover as they had in previous 19th and 20th century lows, policy-makers decided to subsidize the struggling steel mills. However, the restructuring of the steel industry- and the massive reduction in employment- would prove permanent. Rather than rescue a struggling industry, the unsuccessful subsidies caused local economies to continue to operate on a failing socio-economic structure without pursuing other sources of economic development. Subsidies protected Pittsburgh and Sheffield from changes in the global economy for years. As a result, they suffered acute economic restructuring when such economic protections failed. The sudden, dramatic losses in employment and population that resulted when subsidies were stopped increased the difficulty of economic recovery for Pittsburgh and Sheffield.

a. Sheffield

The subsidizing of Sheffield's local steel industry was done on a national level. In 1967, Britain made the decision to nationalize steel production.¹¹⁶ Lead by the Labour government, the nationalization of the British steel industry was a reaction to its decrease in competitiveness on a global scale. The Labour party was "convinced that the private steel companies were not doing enough to restructure the industry".¹¹⁷ Aggressive investment in new technologies was desperately needed to keep British steel competitive with the new players, like Japan, on the world market. This problem of dwindling reinvestment within well-established industries with large market share was previously addressed in the discussion on Schumpeter's Industry Life

¹¹⁶ Geoffrey Tweedale, Steel City: Entrepreneurship, Strategy, and Technology in Sheffield 1743-1993, 340.

¹¹⁷ Ibid.

Cycle hypothesis and Gerhard Mensch's Theory of the Long Wave. In short, as industries mature and fewer companies share the market, firms consequently expand and heavily invest in the prevailing technology. As time and commitment increases, firms are increasingly inflexible and have less incentive to take risks and make significant investments. This pattern of behavior occurred in both the British and U.S. Steel industries.

The British government believed that the nationalization of steel would result in a temporary cessation individual firms' short term mindsets and instead encourage a nationwide coordinated effort to heavily invest in new production technologies. The British Steel Corporation was created from a "merger of fourteen major companies and their 200 or so subsidiaries."¹¹⁸ The act would fragment Sheffield's steel industry, leaving some plants private and others newly nationalized. The government constructed a "three million pound development plan...-the largest capital investment program in British history- [and] aimed to boost BSC's annual output to 36-8 million tonnes by 1983".¹¹⁹ However, the British government had not planned on world steel demand drastically falling. The capital campaign is considered in retrospect as "one of the most ill-timed blunders in British industrial history".¹²⁰

The British government nationalized a series of struggling steel companies. According to a 1967 business analysis, "companies taken over by the BSC...made a collective profit of 9 million pounds after tax" in the year before they were nationalized.¹²¹ To put this profit in context, the amount was considered "a miserable return for a group of major steel companies, which the government itself value[d] for compensation purposes at between 500 and 600 million

¹¹⁸ Ibid.

¹¹⁹ Tweedale, 341.

¹²⁰ Ibid.

¹²¹ Ibid.

pounds”.¹²² The government made the noble effort to save the local mills of each town, regardless of their inefficiency and out-dated technologies. This plan might have worked save the unexpected crash steel demand and price. An alternative strategy would have been to gradually close inefficient mills and only invest in and expand the most promising ones. This would have allowed workers the time and opportunity to relocate to regions with thriving factories. However, such actions are rarely politically popular. While private business is constrained by their short term concern of profit margins, elected governments are often restricted by concern for public approval and reelection. Under such circumstances, it is easy to understand the actions of the British government.

After the fall in steel demand, the BSC was forced to drastically restructure its industry. Within a few years, drastic unemployment hit Sheffield. Within the time span of three years, from 1978 to 1981, the Sheffield region lost 18,700 jobs. In 1981, a total of 38,000 people in Sheffield were jobless, with “12,000 [having been] made redundant” in that year alone.¹²³ The “suddenness and...rather late development” of Sheffield’s restructuring was more extreme than other parts of Northern England. This was due to the concentrated number of steel mills in the city and local labour’s success at keeping inefficient mills open and employing local workers.¹²⁴ In Sheffield, there was “a widespread belief in ...the continuing resilience of the long-established ‘dual economy’ of cutlery and steel”.¹²⁵ But by 1979, Sheffield “witnessed a rapid sequence of steel-plant restructuring and closure, with a massive hemorrhaging of jobs and...within a matter of months, the symbolic razing to the ground of the works that had dominated” the Sheffield

¹²² Ibid.

¹²³ Paul Allender, What's Wrong With Labour?, 73.

¹²⁴ Ian Taylor and Ruth Jamieson, “‘Proper Little Mesters’: Nostalgia and Protest Masculinity in De-Industrialized Sheffield”, Imagining Cities: Scripts, Signs, Memory, Ed. Sallie Westwood and John Williams (London: Routledge, 1997) 162-165.

¹²⁵ Ibid.

region.¹²⁶ Sheffield's citizens "fell into a poverty for which they had not been culturally or politically prepared for in the 1970s."¹²⁷ The nationalization of Sheffield's steel production extended the life of many unprofitable mills, but in the long run, gifted the region with an exaggerated rate of unemployment and a harsh shock to its economic, political, and social fabric.

b. Pittsburgh

While Pittsburgh's steel mills also received forms of protection and subsidies from the national government, the industry was not nationalized. In contrast to Sheffield's situation, many of Pittsburgh's significant steel subsidies came from the state and local governments. Pittsburgh state and local leaders made considerable efforts to "counterbalance the growing trend to relocate manufacturing away from older urban regions such as Pittsburgh".¹²⁸ Their main weapon in this effort was low-interest financing. The state of Pennsylvania created the Pennsylvania Industrial Development Authority (PIDA), which lent "\$106.8 million to ninety-six projects to six counties", including Pittsburgh's Allegheny County.¹²⁹ Additionally, Allegheny created its own development financing entity called the Allegheny County Industrial Development Authority (ACIDA) in 1970. From 1970 to 1980, the ACIDA became "the region's most aggressive source of development capital by packaging \$647 million in low-interest loans."¹³⁰ Significantly, over 50% of all the state and local financing "was used by steel-related companies to defray the costs of meeting Environmental Protection Agency (EPA) standards for

¹²⁶ Ibid.

¹²⁷ Ibid.

¹²⁸ Gleeson and Paytas, 190.

¹²⁹ Ibid.

¹³⁰ Ibid.

air quality in order to retain their mills in the region”. According to Gleeson and Paytas, the low-interest loans “were essential in maintaining the viability of many industrial plants.”¹³¹

However, this delicate economic balance was too difficult to maintain. The region’s extensive system of subsidies collapsed in the early 1970s. Low-interest financing programs had kept Pittsburgh’s steel jobs sheltered from restructuring of the market. When Pittsburgh’s program of subsidies failed, the region was hit with an intense restructuring of their economy. “The suddenness of Pittsburgh’s economic restructuring was unexpected by most local actors, both public and private.”¹³² In comparison to the findings of the Pittsburgh Regional Economic Strategy report of 1963, “the scale and scope of restructuring exceeded even the most dire predictions”.¹³³ Between 1970 and 1990, approximately 157,000 manufacturing jobs left Pittsburgh. However, “more than half of these losses occurred between 1979 and 1984”.¹³⁴ The state and local subsidies promoted a situation in which the fall of the steel market was particularly sudden and harsh. This led Pittsburgh with little time to adapt to the demands of the newly emerging economy.

When the subsidies supporting the factories of Pittsburgh and Sheffield failed, the regions experienced a concentrated drop in unemployment, while simultaneously possessing very few alternative sources of work. By subsidizing the steel industries of Pittsburgh and Sheffield, politicians successfully helped support an industry that was a key provider of local jobs. However, the subsidy programs created little incentive for workers to relocate to other regions with job opportunities or retrain in another field. Likewise, corporations were not as motivated

¹³¹ Ibid.

¹³² Gleeson and Paytas 192.

¹³³ Ibid.

¹³⁴ Gleeson and Paytas, 193.

to critically review their operations and reinvest in infrastructure. Politicians and city planners hoped that subsidies would succeed in protecting the steel industry and did not actively pursue alternative development plans. As an unfortunate consequence, Pittsburgh and Sheffield were acutely “unprepared...for the new circumstances of global competition”.¹³⁵

¹³⁵ Taylor and Jamieson, “‘Proper Little Mesters’: Nostalgia and Protest Masculinity in De-Industrialized Sheffield”. *Imagining Cities: Scripts, Signs, Memory*. Ed. Sallie Westwood and John Williams, 162-165.

VIII. Post Steel

*A radical change of technology...changes the regime of accumulation, but it does nothing to make the mode of regulation change in harmony. It is likely- one might say inevitable- that the necessary harmony will be lost, and that this will cause a crisis, and a depression.*¹³⁶

When it became clear that no amount of subsidies would bring back the lost steel and broader manufacturing jobs of Sheffield and Pittsburgh, their respective city councils looked for solutions to reverse the high rate of unemployment. The historical relationship between local policy-makers and the steel industry affected the cities' early actions to revitalize their region. Sheffield's City Council had very little experience in cooperatively working with private industry. In the troublesome years following the decline of steel employment, Sheffield policy-makers pursued economic solutions that were focused on culture and public infrastructure. While well-intentioned, many of these investments had very little potential for job creation and did not build upon existing strengths in the community. Conversely, Pittsburgh's local political leaders had a long history of working with industrial elites on local development issues. However, these industry leaders were primarily focused on Pittsburgh as a 'Steel City' and early planning decisions were often blind to the larger trends occurring in the global economy. They failed to fix some of the former-manufacturing economy's spatial hindrances, but their early economic development plans built upon the city's assets and existing private industries.

a. History of Sheffield Policy Makers and Development

Before the decline of its steel industry, Sheffield had completed several urban development projects. Most of these were solely funded and conducted by the local government. Around the turn of the century, Sheffield's city leaders administered a series of urban improvements. The city council municipalized monopolies like the water and gas companies, cleared slums, created

¹³⁶ Andrew Tylecote, *The Long Wave in the World Economy: The Present Crisis in Historical Perspective* (London: Routledge, 1991), 18.

new housing schemes, and widened its main streets.¹³⁷ Similar urban improvements were made after World War II. However, the city council did not have a history of experience in improving its town through private-public partnerships or with the advice of local business leaders.

Part of this was due to the relationship between local politicians and industry. In Sheffield, local politicians were closely tied to the labour unions. Since 1926, Sheffield had been a steadfast Labour party locality.¹³⁸ As the name suggests, the Labour party was built with union and labour interests in mind; a great number of the local representatives in Sheffield “show[ed] tremendous solidarity” with the trade unions and fought with them against the corporate leaders of steel mills.¹³⁹ In fact, many of the local politicians were current or former union leaders.¹⁴⁰ As a result, the policies of the local city council often favoured the interests of labour over those of private enterprise. Private industry was an adversary to the goals and work of Sheffield leaders. When the local area lost its manufacturing jobs, the city council did not have a previous history of cooperating with the private sector and had little reason to view public-private partnerships as a potentially useful tool.

b. Sheffield Economic Development Actions

One of the first ‘revitalization’ actions taken by the council was the creation of the Department of Employment. The department was controversial on a national level; it was the first local authority to establish such an entity. Politicians and policy-makers at both the local and national levels voiced concern over the department, as many “believed that employment was [not] an

¹³⁷ H. Keeble Hawson, *Sheffield: The Growth of a City: 1893-1926* (Sheffield: J.W. Northend Ltd., 1968) 1-138.

¹³⁸ Allender, 67.

¹³⁹ Ibid.

¹⁴⁰ Allender, 68.

appropriate area for a local authority to be involved in”.¹⁴¹ The problem with the Department of Employment was not so much that it was a local authority, but that it proceeded to become a massive bureaucracy intent on spending unavailable amounts of public money on economically unsound ventures. There was also a hostility and lack of support for public-private partnerships. According to local government sources, the department “could spend 50.000 pounds a month, if necessary, without going to a full council meeting for approval”.¹⁴² The Department of Employment largely focused on ‘cultural projects’, in “an attempt to brand Sheffield culture.”¹⁴³ However, by investing in cultural projects, the Department was not growing an already strong area of the Sheffield economy. Many of the projects pertained to a very small ethnic minority of the community and, even in a best case scenario, very few high paying jobs could have resulted from the projects. Additionally, the project did not address the majority of the unemployed steel workers who did not belong to the ethnic minority. Key projects the Department of Employment invested in included the National Centre for Popular Music, an “Asian training project, Afro-Caribbean enterprise centres, and a Pakistani Muslim centre”.¹⁴⁴ While potentially contributing to social cohesion and cultural understanding, these projects did very little to foster the growth of jobs that could replace those lost in the steel manufacturing sector.

In addition to the Department of Employment, the local government essentially subsidized jobs by expanding its own payroll. In an effort to reduce unemployment, “the council [began] to expand and maintain its own employment base... [in order] to cushion the effect of the massive loss of steel and engineering jobs”.¹⁴⁵ This strategy proved unpopular among local businessmen.

¹⁴¹ Allender, 84.

¹⁴² Allender, 84.

¹⁴³ Allender, 86.

¹⁴⁴ Allender, 85.

¹⁴⁵ Allender, 86

Many argued that the city council was merely creating jobs to save its own reputation and was employing people with economically unproductive busy work. Although the city council's expansion did provide employment for a portion of the newly unemployed, it only helped delay the harsh economic reality. It may have proven more advantageous for the city council to simply distribute the extra money spent on its expanded payroll to the unemployed and allow them the time to search for other jobs or develop new streams of revenue. By the late 1980s, a large percentage of the expanded city council became unemployed again when national rate-cutting demanded large amounts of redundancies.¹⁴⁶

Although its forays into 'cultural branding' were proven unsuccessful, Sheffield decided to try to brand itself as a city of sport by hosting the World Student Games in 1991. Historically, the city had little precedent as a 'sports' capital. According to a former member of the city council, "the decision to host the World Student games [and build the costly stadium] was not made on the basis of building upon local sporting activity. Rather it was almost literally 'plucked out of the air' as an idea to cement the relationship between the council and the private sector and to attempt to give Sheffield an international profile".¹⁴⁷ In fact, the proposal came not from an economic development committee, but the director of the recreational department in Sheffield. The results of the project were less than desirable, and it has been estimated by council sources that the venture made a loss of between 10-28 million pounds.¹⁴⁸ Significantly, the ill-fated decision to host the World Student Games was "made within the context of a much reduced overall budget, due to rate-capping, and...it necessitated cuts in basic services such as housing, social services and education to finance it."¹⁴⁹ Instead of spending resources on the promotion

¹⁴⁶ Allender, 87.

¹⁴⁷ Allender, 92.

¹⁴⁸ Ibid.

¹⁴⁹ Allender, 93.

of education and skills in technology, Sheffield policy-makers built an unprofitable sports stadium.

In the late 1980s, an organization called the Sheffield Development Corporation was formed to facilitate public-private partnerships for local economic development. However, many of the projects the SDC facilitated did not address the core economic concerns of Sheffield. Two notable public-private partnerships that Sheffield participated in were the building of Meadowhall shopping centre and the South Yorkshire Supertram in the late 1980s, early 1990s. Although the city had very little investment in the actual building of Meadowhall, it did invest substantial amounts of money in reclaiming the old industrial land tract so that it could be developed. The South Yorkshire Supertram, which connects Sheffield to Meadowhall, received funds from all the localities of South Yorkshire in addition to private funding.¹⁵⁰ An unfortunate consequence of Meadowhall and the Supertram was a hollowing-out of downtown Sheffield's core commercial district. By the mid-1990s, Sheffield's commercial downtown "resembled a ghost town" and lost approximately 20% of its trade by Meadowhall's second year.¹⁵¹ The Supertram contributed to this hollowing out by facilitating easy transport to the shopping mall.

Secondly, the economic development value of Meadowhall was questionable at best. Most of the jobs offered by the shopping centre are low-paying, unskilled and insecure. Sheffield unemployment figures do not in themselves give an entirely accurate picture of the city's economic health since many of the previously unemployed workers are now in low-paying, insecure jobs.¹⁵² Kostas Georgiou, who compiled the application data for Sheffield's successful bid for EU Objective One Status in 1998, found that "between 1978 and 1998 average earnings

¹⁵⁰ Peter Townroe, "The Coming of Supertram: The Impact of Urban Rail Development in Sheffield", Transport and Urban Development, Ed. David Banister (London: E&FN Spon, 1995) 162-173.

¹⁵¹ Allender, 94.

¹⁵² Allender, 98.

in south Yorkshire fell from above the national average to 12% below it...These [earnings were] overwhelmingly in the service sector, many of them in the retail sector at Meadowhall... By 1989, 65% of employment was in the service sector compared to 57% in 1981 and 44% in 1971.”¹⁵³ Finally, the service sector was not very successful in replacing lost manufacturing jobs. During the twenty year period from 1978 to 1998, Sheffield lost a total of 177.000 jobs, while gaining 47.000 in the service sector. In total, Sheffield lost approximately 130.000 jobs.¹⁵⁴

In recent years, Sheffield has put greater focus on rebuilding their downtown area. The *Heart of the City Project* was initiated in early 2000. It is approximately a 120 million pound initiative which has helped encourage downtown development and the creation of a variety of public space, such as gardens and plazas.¹⁵⁵ The city’s development corporation has also tried to encourage the formation of technology clusters by building a science business park. However, the region still suffers from a suburbanized and fragmented spatial composition as well as a lack of high paying employment. There has been what some term a ‘feminizing’ of the workforce as women of the region are more willing than the men to work in lower-paying, retail jobs.¹⁵⁶ Although the city has tried in recent years to develop more comprehensive development strategies, it has struggled to attract industry and wasted valuable time and resources with its early mistakes. The poorly planned development agenda of its early years helped to prolong the economic hardship of Sheffield.

¹⁵³ Ibid.

¹⁵⁴ Ibid.

¹⁵⁵ Allender, 95.

¹⁵⁶ Allender, 98.

c. History of Pittsburgh Policy Makers and Development

After subsidies failed to prevent job loss in Pittsburgh, city officials also began to look for other economic solutions. Unlike Sheffield, however, Pittsburgh had a significant history of public-private partnerships and urban development projects, which had taken place prior to the decline of the steel industry. This would greatly affect their approach to economic development post-steel.

After the Second World War, the city of Pittsburgh embarked on an ambitious and forward-thinking urban development project named *Renaissance*. *Renaissance* was a reaction to the “severely degraded environment [which] so diminished...quality of life that corporations...considered moving their headquarters out of Pittsburgh”.¹⁵⁷ The project was created at a time when the idea of ‘urban development’ had not even come into the public’s consciousness and is generally considered a story of success. A key aspect of its success was its incorporation of private-public partnerships.¹⁵⁸ Two of the early private, non-profit development organizations were run by some of the biggest names in Pittsburgh and U.S. business. The Pittsburgh Regional Planning Association was chaired by Howard Heinz, while the later formed Allegheny Conference on Community Development was dominated by Richard K. Mellon, “heir to the powerful Mellon family financial interests”.¹⁵⁹

Pittsburgh was also the recipient of a great deal of philanthropy from business elites of the area, including the Heinz, Carnegie and Mellon Families. In contrast to Sheffield, many of the

¹⁵⁷ Edward K Muller, "Downtown Pittsburgh: Renaissance and Renewal," Pittsburgh and the Appalachians: Cultural and Natural Resources in a Postindustrial Age, Ed. Joseph L. Scarpaci with Kevin J. Patrick (Pittsburgh: University of Pittsburgh Press, 2006) 8.

¹⁵⁸ Brian Jacobs, Strategy and Partnership in Cities and Regions (New York: St. Martin's Press, 2000) 68-103.

¹⁵⁹ Muller, "Downtown Pittsburgh: Renaissance and Renewal," Pittsburgh and the Appalachians: Cultural and Natural Resources in a Postindustrial Age, Ed. Joseph L. Scarpaci with Kevin J. Patrick, 8.

development projects completed before and after the decline of steel were supported by donations from these elites.¹⁶⁰ The *Renaissance I* project was terminated in 1970 with the election of Major Pete Flaherty, who believed that the city's money should be directed towards deprived neighborhoods, rather than the economic development of the downtown area.

The previous experience of Renaissance I meant that Pittsburgh policy-makers and business leaders had already formed many of the organizations and relationships necessary for economic development. However, *Renaissance I* also brought serious biases to the development agenda. *Renaissance I* was heavily tied to the Pittsburgh Steel industry and dedicated to the preservation of a solid downtown Pittsburgh. It was focused on improving Pittsburgh's physical environment, but also steadfast on protecting the already-existing spatial composition of the city.¹⁶¹ The mill towns of Pittsburgh remained isolated from one another, with main connections only going downtown. As previously discussed, the fragmented region was segregated by ethnicity and class. Business and steel leaders believed that connecting these regions would cause more harm than good. Consequently, most business and community leaders failed to recognize "the potential benefits of connecting their communities".¹⁶² In the early 1950s, the local Pittsburgh government rejected the proposals of state and regional planners to build a system of highways which would connect the fragmented Pittsburgh. City, suburban, and business leaders believed that "too much highway infrastructure...would encourage people and commerce to leave the city".¹⁶³ However, the region continued to lose population from its core, despite the efforts of city leaders, and Pittsburgh became increasingly disconnected.

¹⁶⁰ Muller, "Downtown Pittsburgh", 8-12.

¹⁶¹ Muller, "Downtown Pittsburgh", 8.

¹⁶² Gleeson and Paytas, 185.

¹⁶³ Gleeson and Paytas 189.

d. Pittsburgh Economic Development Actions

Renaissance II, spanning from 1977 to 1988, failed to reverse these spatial trends. The agenda, like *Renaissance I*, was primarily focused on the physical structures of the downtown district. Early projects used private-public partnerships to build a convention center, a light-rail transit line, and several large skyscrapers in the new PPG Place complex.¹⁶⁴ Policy-makers continued to promote development and zoning restrictions which discouraged suburban industrial development. These policies may have hampered the formation of potential economic clusters.¹⁶⁵ The hyper-concentration of funding on the downtown region also temporarily backfired when “an unexpected second wave of corporate restructuring hit Pittsburgh hard in the mid-to-late 1980,...with the brunt...borne by white-collar workers’.¹⁶⁶ The downsizing of many of America’s top corporations caused “downtown Pittsburgh [to lose] its status as one of the nation’s largest concentrations of Fortune 500 corporate headquarters.”¹⁶⁷

The policy-makers focus on the downtown ignored the fragmented spatial composition of Pittsburgh and hindered the development of possible suburban industry clusters. But it also formed the appealing downtown that Pittsburgh has today. Cultural projects, like the Andy Warhol Museum, built upon Pittsburgh’s inherent strengths.¹⁶⁸ Finally, the city undertook an extensive remodeling of the former industrial strip near its city center in the late 1990s. The area

¹⁶⁴ Muller, “Downtown Pittsburgh”, 13.

¹⁶⁵ Gleeson and Paytas 187.

¹⁶⁶ Gleeson and Paytas 192,

¹⁶⁷ Ibid.

¹⁶⁸ Muller, “Downtown Pittsburgh”, 18. Pittsburgh is the birthplace of Andy Warhol. Additionally, the Carnegie Art Museum boasts a collection of Van Gogh paintings which were donated by Andrew Carnegie.

was transformed from an industrial warehouse zone to a young, cultural district.¹⁶⁹ It is now a popular with college students and young professionals.

Arguably the most important legacy of Pittsburgh's regional development efforts has been the formation of public-private partnerships with technological and medical research. One of Pittsburgh's main industries today is the biotechnology field. It is in this area that Pittsburgh has had success in creating jobs and beginning the transition to a knowledge economy. Funded by philanthropic and state entities in 1983, the Pittsburgh High-Technology Council and the Ben Franklin Technology Partnership worked together to help transfer new technologies from universities to the marketplace and...created a new agency to provide direct assistance to technology entrepreneurs."¹⁷⁰ According to the Ben Franklin Technology Partnership, "from 1989 to 2001, BFTP boosted the state's economy by \$8 billion and helped to create 93,105 job-years."¹⁷¹ The BFTP estimates that the state invested only \$3.342 per job-year.¹⁷² In Pittsburgh alone, from 1983 to 1985, "40,000 new jobs ...[were] created as the high-tech firm count in the city reached an unprecedented count of 415."¹⁷³ Building on its success, the Pittsburgh High-Technology Council created the Pittsburgh Biomedical Development Corporation (PBDC) in 1989.¹⁷⁴ The PBDC has helped local entrepreneurs with the funding necessary for

¹⁶⁹ Joseph L. Scarpaci, "Pittsburgh's Strip District: From Industry and Warehousing to Ethnic Chic", Pittsburgh and the Appalachians: Cultural and Natural Resources in a Postindustrial Age, Ed. Joseph L. Scarpaci and Kevin J. Patrick (Pittsburgh: University of Pittsburgh Press, 2006) 64-70.

¹⁷⁰ Gleeson and Paytas, 195.

¹⁷¹ Ben Franklin Technology Partners. <http://www.benfranklin.org/about/index.asp> [accessed July 16th, 2008].

¹⁷² Ibid. According to the BFTP website, "Job years are defined as the number of jobs created that lasted a full year or more multiplied by the number of years they have existed to date."

¹⁷³ "The Role of the Pittsburgh High Tech Council". Published by Associated Content. http://www.associatedcontent.com/article/13123/the_role_of_the_pittsburgh_high_tech.html?page=4&cat=37 [accessed June 25' 2008].

¹⁷⁴ Ibid.

biotechnology startups. It is important to note that policy-makers used public-private partnerships to build on an industrial sector already in existence. Pittsburgh's University of Pittsburgh Medical Center and Carnegie Mellon University are both prestigious scientific institutions with long histories of cooperation with industry. The UPMC is today one of the top hospitals in the United States and has played home to several renowned researchers, including Jonas Salk- the developer the polio vaccine.¹⁷⁵ The Pittsburgh High Technology Council and the state of Pennsylvania encouraged students in the area to specialize in the technological sciences, while simultaneously supporting innovations from individuals and its already-existing institutions.¹⁷⁶ This combined approach has helped stem the brain drain from the city and encouraged the development of an economy focused on the production of knowledge.

¹⁷⁵ Steven Levin, "Western Psych a Perfect Place to Star", Pittsburgh Post-Gazette (December 25, 2005), <http://www.post-gazette.com/pg/05359/627795.stm> [accessed June 27, 2008].

¹⁷⁶ "The Role of the Pittsburgh High Tech Council". Published by Associated Content. http://www.associatedcontent.com/article/13123/the_role_of_the_pittsburgh_high_tech.html?page=4&cat=37 [accessed June 25' 2008].

IX. Sheffield and Pittsburgh in the Knowledge Economy

The economic restructuring and resulting job loss experienced by Europe and North America in the second half of the 20th century forced both workers and policy makers to recognize the changes occurring in the global economy. As jobs became replaced by more efficient machines and processes or outsourced to cheaper countries, discussions on the emerging ‘knowledge-based economy’ became increasingly prominent in public discourse. What is meant by a knowledge-based economy? In a narrow sense, it has been used to refer to the rise of information technology (IT) and related industries. Fields such as computer engineering, software, information systems, and biotechnology have all been popularly included under the ‘knowledge-economy’ banner. But in a broader and more accurate application, a knowledge economy includes a vast array of industry. Whereas a traditional economy relied on inputs such as steel or coal, in the new knowledge-based economy “knowledge and information are the main inputs and outputs”.¹⁷⁷ This development does not only pertain to the service sector, but also to areas such as agriculture and manufacturing.¹⁷⁸ In these areas, the development of advanced and efficient processes replaces the importance of “the physical manufacture of a product”.¹⁷⁹ Because of this change in processes, the economic geography and required resources of the knowledge economy fundamentally differ from the traditional, manufacturing economy.

a. The Spatial Composition of the Knowledge Economy

The suburbanized and fragmented landscape of Pittsburgh and Sheffield is in conflict with the spatial characteristics of a successful knowledge economy. Frances Cairncross famously

¹⁷⁷ Leo Van Den Berg, Peter M.J. Pol, Willem Van Winden, Paulus Woets, European Cities in the Knowledge Economy: The Cases of Amsterdam, Dortmund, Eindhoven, Helsinki, Manchester, Munich, Munster, Rotterdam and Zaragoza (Aldershot, England: Ashgate Publishing Limited, 2005), 4.

¹⁷⁸ Van Den Berg, European Cities in the Knowledge Economy, 1.

¹⁷⁹ Ibid.

predicted that the ICT revolution would result in a 'death of distance', making suburbanization more common and dense cities no longer necessary.¹⁸⁰ However, economists have become increasingly convinced in the positive influence that agglomeration and dense 'knowledge clusters' have on innovation and economic growth.¹⁸¹ According to Leamer and Storper:

Previous rounds of infrastructure improvement always have had a double effect, permitting dispersion of certain routine activities but also increasing the complexity and time-dependence of productive activity, and thus making agglomeration more important.¹⁸²

Key to this conclusion is the observation that knowledge is "generated and transmitted more efficiently via local proximity".¹⁸³ This is most appropriately connected to tacit knowledge. This non-codified, "sticky" knowledge is highly correlated to innovative activity and technological advances.¹⁸⁴ Additionally, cities can help encourage "knowledge spillovers", by providing large, dense networks of firms who are well connected to local and other regional economies.¹⁸⁵

Sheffield and Pittsburgh acted as clusters for the steel manufacturing industry. As the industry grew, more firms were attracted to these steel hubs, and the number of firms directly or indirectly involved with the manufacture of steel increased. However, unlike modern-knowledge

¹⁸⁰ Frances Cairncross, The Death of Distance: How the Communications Revolution Will Change Our Lives (Cambridge: Harvard Business School Press, 1997).

¹⁸¹ A. Venables, "Geography and International Inequalities: the Impact of New Technologies", *Journal of Industry, Competition and Trade* (2001), 135-160.

¹⁸² E. Leamer and M. Storper, "The Economic Geography of the Internet Age", NBER Working Paper No. 8450 (2001).

¹⁸³ David B. Audretsch, "Agglomeration and the Location of Innovative Activity" *Oxford Review of Economic Policy*, 1998, vol. 14, issue 2, pages 18-29.

¹⁸⁴ E. Von Hippel, "Sticky Information and the Locus of Problem Solving: Implications for Innovation," *Management Science*, 40 (1994) 429-439.

¹⁸⁵ Audretsch, "Agglomeration and the Location of Innovative Activity", *Oxford Review of Economic Policy*, (1998), 2, 18-29.

economies, the manufacture of the physical product (and, in particular, the input of physical natural resources) played a large role in the steel industry cluster. Manufacturing industries, such as steel, tended to cluster in the region of these essential natural resources. This promoted mill towns, which were disconnected from a dense core and whose sole existence was dependent on a single factory.

According to current economic geography theory, the suburbanized and fragmented geography of Pittsburgh and Sheffield is detrimental to the cities' efforts to develop a 'knowledge economy'. The two cities' economic geographies do not facilitate the transmittance of the crucial tacit knowledge needed for innovation. Although Pittsburgh has historically made many efforts to revitalize and enrich its downtown core, it has done little to connect the isolated former mill towns. Additionally, policy-makers may have thwarted new, naturally occurring knowledge clusters from developing by discouraging suburban industrial development. Because Sheffield began to focus on the downtown core only in the late 1990s, the area is still deficient in some of the architectural and cultural features which make a downtown appealing.

The city centers of Sheffield and Pittsburgh have not become denser since the failure of their region's mill towns. Already suburbanized before the decline of steel, the cities of Pittsburgh and Sheffield have consistently lost population as residents continue the suburbanization trend or relocate to other areas with better job opportunities. Pittsburgh, in particular, tried to fight these tendencies by constructing transportation development policies that were biased towards the downtown. However, these policies have failed to stem population loss from the core and resulted in Pittsburgh continuing to have a fragmented population.

Labour surveys and studies on the 'knowledge-economy' emphasize that workers desire "thick labour markets" which allow them the potential to switch companies freely. This is in steep contrast to older manufacturing labour markets like the steel industry, where employees would

often stay in a location and with a company for their working lives.¹⁸⁶ In order to increase the availability of jobs and cultivate thick labour markets, a city and its region must be spatially well-integrated. Pittsburgh is one of the few metropolitan areas in the United States without an adequate system of highways and remains internally subdivided. Sheffield has also had to deal with problems of fragmentation, but is affected even more so by its relative geographical isolation. It does not possess an airport and its location is inconveniently far from London.

b. Knowledge Economy Inputs

Unlike the traditional manufacturing economy, modern knowledge economies do not necessarily need to be located near the physical manufacture of their products. According to Florida, the one element that knowledge industries absolutely require of a region is large populations of highly skilled available labour. In 1999, the then CEO and president of Hewlett-Packard, Carly Fiorina, noted the following at an annual meeting:

*We don't need any more tax incentives. We don't need any more big incentive packages. We don't even need highway interchanges. Of course, in some instances, we'll take them. We will go where the highly skilled people are. If you have people, we will come to your jurisdiction. If you don't have people, we can't come no matter how much money you want to pile up and shove in front of us. We will go where the highly skilled people are.*¹⁸⁷

Additionally, Florida and leading economists argue that knowledge workers and knowledge companies have a reciprocal build-up effect. More knowledge workers cause the city to become more attractive to companies, and more knowledge-based companies attract more skilled workers.

¹⁸⁶ Richard Florida, "Pittsburgh and the Creative Age", Pittsburgh and the Appalachians: Cultural and Natural Resources in a Postindustrial Age, ed. Scarpaci and Patrick, (Pittsburgh, University of Pittsburgh Press, 2006), 239-241.

¹⁸⁷ Richard Florida, "Pittsburgh and the Creative Age", Pittsburgh and the Appalachians: Cultural and Natural Resources in a Postindustrial Age, ed. Scarpaci and Patrick, (Pittsburgh, University of Pittsburgh Press, 2006), 237.

With the decline of the steel industry, Pittsburgh and Sheffield were left with a labour force that did not have the background necessary to attract or grow a 'knowledge economy'. The largely blue-collar working forces, which were "once employable", now possessed "skills [that] were obsolete and unmarketable in a changing economy".¹⁸⁸ In order to create jobs and revive their economies, Pittsburgh and Sheffield needed to attract qualified workers, while simultaneously growing innovation.

c. Attracting and Retaining Skilled Workers

If companies require qualified labour to locate in a city, policy-makers must find ways to attract and retain skilled workers. The quality of life in a city can have a great effect on its ability to attract young, skilled labour. Unlike the often geographically determined industries of steel and coal, most 'knowledge-based' industries do not require placement in near specific natural resources or geographic regions. Richard Florida has noted the importance of an appealing environment and atmosphere in attracting both highly trained knowledge workers to a region.¹⁸⁹

In terms of physical environment, the steel industry has left a legacy air pollution, brownfields, empty warehouses and poorly constructed mill towns. Both Sheffield and Pittsburgh have made considerable efforts to "green" their cities. Pittsburgh, in particular, is well-known for its *Renaissance I's* success in reducing air pollution. Sheffield has created several botanical gardens and green spaces. Pittsburgh has also remodeled its industrial warehouse district, known as the Strip, into "a fashionable district of shops, restaurants, nightclubs".¹⁹⁰ Both Pittsburgh and

¹⁸⁸ Baum and Twiss, Social Work Intervention in an Economic Crisis: The River Communities Project, 5.

¹⁸⁹ Richard Florida, "Pittsburgh and the Creative Age", ed. Scarpaci and Patrick, *Pittsburgh and the Appalachians: Cultural and Natural Resources in a Postindustrial Age* 238-244.

¹⁹⁰ Scarpaci, "Pittsburgh's Strip District: From Industry and Warehousing to Ethnic Chic" Joseph L. Scarpaci, "Pittsburgh's Strip District: From Industry and Warehousing to Ethnic Chic", Pittsburgh and the Appalachians: Cultural and Natural Resources in a Postindustrial Age, Ed. Joseph L. Scarpaci and Kevin J. Patrick, 64.

Sheffield have failed to adequately remodel their former mill towns or better connect them to the cities' core and the region at large. Plans to build a metropolitan beltway that would connect Pittsburgh's lower valley region to the downtown core are still uncompleted. It may be that these mill towns, whose formation and existence depended upon the steel industry, are no longer viable in a knowledge economy's economic geography.

Lastly, Florida emphasizes the important role that immigration and tolerance of diversity play in the attraction of knowledge workers. It is very common for new economy industries to draw from a global labour pool in their search for scarce, highly skilled workers. The Milken Institute listed the diversity caused by immigration "as one of the two most powerful demographic trends reshaping the nation's cities and regions".¹⁹¹ The top contenders in its 'Melting Pot Metros' also happened to be the new "hot spots of economic growth."¹⁹² Modern technology firms are well known for their workers' diversity and employ a large percentage of "foreign-born entrepreneurs and technologists".¹⁹³ Because of the diverse nature of knowledge economy workers and innovators, it is important that cities looking to attract such labour are tolerant and accepting of differences. Schumpeter, in fact, listed tolerance of diversity as one of his three necessary requirements for innovation and economic growth. Although Pittsburgh was once a major attractor of immigrants, it did not make Melting Pot Metros top twenty-one cities list. Sheffield, due to its geographic isolation, mainly attracted immigrants from similar cultural backgrounds.¹⁹⁴ It is significantly less diverse today than other former manufacturing cities such as Manchester and Leeds.

¹⁹¹ Florida, 243.

¹⁹² Ibid.

¹⁹³ Ibid.

¹⁹⁴ Kosmin et al., Steel City Jews: A Study of Ethnicity and Social Mobility in the Jewish Population of the City of Sheffield, South Yorkshire, Edited by the Research Unit Board of Deputies of British Jews, 1-28.

d. Growing Innovation and Industry

If industry can only be attracted primarily with skilled labour and the area is struggling to revitalize, then it must also find ways to support innovation and grow industry. According to a 1996 OECD study, the future of successful OECD economies will revolve ‘learning clusters’ and technologically advanced production.¹⁹⁵ Local universities and research institutions can play an important role in the generation of new ideas and processes. But the simple existence of these institutions is not enough. Innovation needs access to the market. One way to connect innovation and funding is through the support of public-private partnerships. According to public policy experts such as Brian Jacobs, the formation of public-private partnerships has been one of the most effective local development strategies in recent decades.¹⁹⁶ Pittsburgh has successfully done this in the area of medical technology. The seeds for these industries were initially planted by entrepreneurs and Carnegie Mellon, University of Pittsburgh, and the University of Pittsburgh Medical Center. However, the city of Pittsburgh facilitated the transformation of these ideas into industrial growth by forming public-private partnerships and creating mechanisms to provide initial funding. Unlike Sheffield, Pittsburgh could rely on its history of medical innovation and public-private partnerships after the collapse of its steel industry employment. Sheffield began to create form public-private partnerships for development in the late 1980s, but most of these early projects were focused on physical structures and were not economically beneficial in terms of job creation. The city has recently begun to form more technology-based partnerships, such as the creation of technology parks, but enough time has not past for the effects of such partnerships to have fully manifested.

¹⁹⁵ OECD, “Knowledge Economy”, <http://www.oecd.org/dataoecd/51/8/1913021.pdf> [accessed June 6th, 2008].

¹⁹⁶ Jacobs, Strategy and Partnership in Cities and Regions, 1-45.

X. Unfulfilled Hopes: Failures and Criticisms of the “Knowledge Economy”

In recent years, Pittsburgh and Sheffield have both sought to brand themselves as a ‘knowledge economy’. However, what makes a small region or city a “knowledge economy”? There is considerable misunderstanding of the term. Rather than referring to advanced economies’ comparative advantage in knowledge production and application, policy makers and politicians have often erroneously interchanged the “knowledge economy” with the IT sector. Hence, the majority of programs in Pittsburgh and Sheffield focused on generating a ‘knowledge economy’ were related to high tech startups.

Jean Gadrey is an example of critics who associate a ‘knowledge economy’ with the IT sector. Gadrey argues that the number of ‘IT-related jobs’ created, as well as secondary jobs created due to greater productivity, has been exaggerated by ‘knowledge economy’ enthusiasts.¹⁹⁷ Indeed, government and think tank reports are guilty of making unrealistic predictions of the ‘soaring’ IT sector’s potential for job creation. In 1998, the Statistical Abstract of the United States estimated that new ICT fields would create 8.6 million jobs between 1996 and 2006. However, Gadry’s calculations, operating within stricter definition of ICT jobs, predict only 1 million jobs at best.¹⁹⁸ The confusion between a “knowledge economy” and an “IT economy” created two key problems in the perception and practice of cultivating a ‘knowledge economy’.

First, many policymakers fully believed that transforming their respective cities into mini Silicon Valleys was the key to economic revitalization. But there is serious doubt among economists as to whether knowledge clusters can be artificially produced through public policy. This is particularly relevant for cities such as Pittsburgh and Sheffield, which have aimed to “create” knowledge clusters. New Economic Geography, pioneered by economists such as Paul

¹⁹⁷ Jean Gadry, *New Economy, New Myth* (London: Routledge, 2003) 25.

¹⁹⁸ Gadry, 26.

Krugman, studies the way clusters have formed. According to Phillip Cooke, “even though public bodies may get involved by giving support of various kinds, the dominant cluster causation vector is one in which the firms that realize commercialization are mainly funded privately, often as risky ventures from which investors expect a generous return”.¹⁹⁹ Since the ‘knowledge economy’ is highly dependent on the generation of new scientific knowledge, proximity to leading universities, rival and complementary firms, and research labs has become increasingly important. With a build-on effect, “the critical mass of ‘stars’, their disciples, research centres, equipment, and trusted contacts make for a remarkable immobility of leader scientific research centres”.²⁰⁰ It appears difficult for a city to attract new economy industries with little or no base to build upon. For instance, Pittsburgh’s health technology cluster arose from the city’s long tradition of hospitals and medicine.

The second problem relates to employment. Many naïve optimists promised struggling manufacturing towns that government programs would “create” a “knowledge economy” that could restore towns to their former glory. Policymakers’ efforts to create an ‘IT-centric economy’ have failed to solve the main problem in cities such as Pittsburgh and Sheffield: the dearth of well-paid jobs for skilled, labour-orientated workers. The burgeoning IT sector in Pittsburgh and Sheffield has provided some highly paid positions, however such jobs are limited and require advanced university education. Employment opportunities for less educated, trained skilled workers have yet to manifest, and much of the labour not directly associated with innovation, such as assembly and production, has been outsourced to other countries to keep costs low.

¹⁹⁹ Phillip Cooke, *Knowledge Economies: Clusters, Learning, and Cooperative Advantage* (Routledge: London, 2002) 157.

²⁰⁰ Cooke, *Knowledge Economies: Clusters, Learning, and Cooperative Advantage*, 158

Reports such as the Department of Commerce's "The Emerging Digital Economy" and The Statistical Abstract of the US have greatly influenced the mistaken belief that a knowledge economy is synonymous with the IT sector. Policy makers and struggling cities, such as Pittsburgh and Sheffield, have based much of their regional revitalization plans upon the idea that promotion of IT industries will result in booming job growth. Inaccurate measurements and inflated predictions drastically affect a region's decision to pour precious financial resources into attracting IT industry. The populations of workers and future workers who are negatively affected by the transition in the global economy have yet to see any real benefit from this bastardized vision of a "knowledge economy".

XI. The “Green Economy”: The New Solution for Struggling Industrial Cities?

The misunderstanding and misapplication of the ‘knowledge economy’ concept has resulted in considerable disappointment for former manufacturing regions like Pittsburgh and Sheffield. Disillusioned by the lack of quick results and replacement jobs for their constituents, many politicians and policymakers are supporting a new ‘brand’ of economic revitalization: the “green” manufacturing economy. A key feature of the “green economy” is the promotion of high paying jobs that require semi-skilled workers, are environmentally friendly and utilize specialized, state of the art technologies. Underpinning the movement is the hope that the establishment of “green industries” such as renewable energy production and equipment manufacturing, would adequately provide jobs for those that would have otherwise been employed in the steel and manufacturing sector. A second feature of the ‘green job’ sector, as envisioned by proponents, is its relative inability to be outsourced to other countries. Although foreign companies are currently the main investors in American and British renewable energy, the hope is that the creation of a renewable utility industry would result in jobs which cannot be outsourced due to the technological restrictions and needs of energy creation and storage grids.

The rhetoric, discussions, and public policy have largely taken place in the United States, Europe and the United Nations, and the following section will examine this new trend by identifying its origins, theory, core aims, and requirements. This discussion is highly relevant to the topic of revitalization of former industrial towns. Sheffield has stated its interest in pursuing green initiatives, but has done little in the area so far. As such the potential for a ‘green economy’ in Sheffield cannot be evaluated in any detail. However, the greater Pittsburgh region has already begun to work towards creating a “green economy” and has invested significant resources. But coupled with the great enthusiasm for a green economy is equally strong criticism. A recent study on Spain’s publicly subsidized renewable energy industry argues that the results have been disastrous and have, in fact, caused job loss. This study is particularly interesting since Europe,

and especially Spain, has been used as a template for how to encourage such an industry in the United States. Finally, the promises of the ‘green economy’ will be analyzed within the context of Pittsburgh and Sheffield’s revitalization histories and present needs.

a. The Green Economy: Origins and Concepts

The idea of developing an environmentally-friendly economy has existed for years. Academic fields such as environmental economics have emerged in recent years in response to a growing interest in building environmental protections and safeguards into the global economy. However, the idea of a ‘green new deal’ – a widespread economic recovery plan centered around renewable energy manufacturing and other ‘green jobs’- is new. The concept has become popular in the United States on the national level and in the United Nations on the global level, and has already been instituted in parts of Europe. This popularity is largely due to three important trends: increased concern over carbon emissions (in relation to global warming), energy independence, and the economic malaise caused by the housing bubble and financial speculation. American President Barack Obama made proposals for a ‘green new deal’, which would “create millions of additional jobs and entire new industries”, as one of the central features of his campaign.²⁰¹ On the global level, the United Nations has commissioned several in-depth studies on the impact that renewable energy and environmental regulation could have on national economies, with a particular emphasis on poverty-reduction in some of the world’s most deprived nations.²⁰² The European Union has already adopted many ‘green policies’ and Germany and Spain lead in the development of a renewable energy industry.

²⁰¹ Gabriel Calzada Alvarez et al., “Study of the Effects on Employment of Public Aid to Renewable Energy Sources”, (Universidad Rey Juan Carlos, March 2009) 1.

²⁰² While an important facet of the ‘green economy’ movement, U.N. initiatives to foster ‘green economies’ as a tool for economic development in the third world will not be dealt with in this thesis. The thesis focuses only on the promises of job creation in advanced economies, with declining manufacturing sectors.

The American think tank, the Center for American Progress, has been one of the most vocal proponents of a ‘green recovery’ plan for the United States, as proposed by Barack Obama. In collaboration with the Political Economy Research Institute (PERI), they published a report entitled “Green Recovery: A Program to Create Good Jobs and Start Building a Low-Carbon Economy”.²⁰³ The report proposes a “green economic recovery program [that] would spend \$100 billion dollars...and could be paid for with proceeds from auctions of carbon permits under a greenhouse cap-and-trade program”.²⁰⁴ PERI estimates that the “fiscal expansion would create 2 million jobs”.²⁰⁵ The proposal focuses on six areas of investment for the nation:

1. retrofitting buildings to improve energy efficiency
2. Expanding mass transit and freight rail
3. Constructing ‘smart’ electrical grid transmission systems
4. Wind power
5. Solar power
6. Next-generation biofuels²⁰⁶

The development of renewable energy technologies and production is a key feature of ‘green economy’ proposals. PERI suggests that such progress be encouraged through “public funds, tax credits, and loan guarantees to spur private-sector investment”.²⁰⁷ The report argues that a 100 billion dollar investment in the green energy sector would result in a greater number of jobs for

²⁰³ Robert Pollin, Heidi Garrett-Peltier, James Heintz, and Helen Scharber “Green Recovery: A Program to Create Good Jobs and Start Building a Low-Carbon Economy” (Center for American Progress and Political Economy Research Institute, September 2008).

²⁰⁴ Pollin et al., “Green Recovery: A Program to Create Good Jobs and Start Building a Low-Carbon Economy”, 1.

²⁰⁵ Ibid.

²⁰⁶ Pollin et al., 2.

²⁰⁷ Ibid.

skilled workers, lower unemployment, stimulus for the construction and manufacturing sectors, more stable oil prices, and “self-financing energy efficiency”.²⁰⁸

Although plans for a ‘green’ economic initiative have been introduced on the global and national levels, proposals within the United States have placed special emphasis on the possible positive effects that a policy could have the country’s struggling industrial towns. The term “green-collared job” has been used to describe the type of employment that could be created by a ‘green new deal’ initiative. According to proponents of the plan, “green collar jobs” would be similar to “blue-collar” jobs except that the jobs would be related to renewable energy or other environment-friendly work, such as building retrofitting.

It is hoped that ‘green-collar jobs’ would adequately replace those formerly held in the steel and automotive manufacturing industries. An ‘adequate’ replacement job would be one that required specially-trained workers, similar high pay, and an aversion toward outsourcing.²⁰⁹ Such a proposal is incredibly popular among former manufacturing industry workers and struggling towns such as Pittsburgh. Groups like the Blue Green Alliance, “a partnership between the United Steelworkers and the Sierra Club” are enthusiastic about ‘green new deal’ and see greater amounts of steel being manufactured for technologies such as wind turbines.²¹⁰ Increasingly, ‘green jobs’ are gaining support from traditional manufacturing workers and, especially, policymakers from struggling regions.

²⁰⁸ Pollin et al, 2-4.

²⁰⁹ Steven Greenhouse, “Millions of Jobs of a Different Collar”, The New York Times (March 26, 2008).

²¹⁰ Ibid.

b. Pittsburgh: Growing a “Green Economy”

Convinced that renewable energy is the key to their towns’ revitalization, some policy leaders have already begun wooing industry leaders to their regions through subsidies and tax exemptions. Notably, the Pittsburgh region is one of the most prominent. Pittsburgh has heavily invested public resources into the renewable energy field. As a result, prominent conferences on renewable energy have been held in the city, and companies, especially foreign subsidiaries, have come to invest in the Pittsburgh and greater Pennsylvania region.²¹¹

Little progress in the area of renewable energy had been made until Governor Ed Rendell came into office in 2003. He envisioned a renewable energy policy that would help Pennsylvania grow a specialized industry that in turn would attract high paying jobs. In particular, it is the goal of such policies to fill the void of former high paying jobs in the steel and manufacturing industries. The state’s policies have garnered considerable attention on a national and international scale.²¹² Key to Pennsylvania’s new energy policy is a set of regulations regarding energy portfolios. Pennsylvania has “established the nation's most progressive alternative energy portfolio standard, ensuring that 18 percent of all energy generated comes from clean, efficient sources by the year 2020. Benefits include \$10 billion in increased output, \$3 billion in additional earnings and as many as 4,000 new jobs for residents over the next 20 years”.²¹³ In terms of renewable, current policy dictates that “8% of the electricity sold at retail in the state [must] come from renewable

²¹¹ Ibid.

²¹² State of Pennsylvania “Governor Rendell’s Clean Energy Initiatives Gaining New International Attention: Governor’s Energy Initiatives Featured at Wind Conference in Germany” (Harrisburg, PA: May 25, 2006) <http://www.state.pa.us/papower/cwp/view.asp?A=11&Q=453134> (Accessed on May 30, 2009).

²¹³ The Pennsylvania Department of State, “Energy Security: The Pennsylvania Story”, http://www.dep.state.pa.us/dep/deputate/pollprev/PDF/Energy_Security_chart_rev.pdf. Accessed on June 15, 2009.

resources by 2021, including 0.5% from solar photovoltaics”. Additionally, Pennsylvania now requires all state government buildings to draw twenty percent of its electricity from “green” or renewable energy sources.²¹⁴

These regulations work in conjunction with massive grant and incentive programs, at least partially funded through taxpayer dollars. The Pennsylvania Energy Harvest Grant Program “has awarded \$15.9 million and leveraged another \$43.7 million in private funds [for renewable energy] since its inception in May 2003.”²¹⁵ The Pennsylvania Department of Community and Economic Development offers “competitive incentive packages composed of loans, loan guarantees, and grants...to renewable energy manufactures” and the Pennsylvania Department of Environmental Protection gives “over \$20 million in annual grant money...for alternative energy projects”.²¹⁶

Starting in February 2007, the state has accelerated their financial support of the renewable energy industry. The Energy Independence Strategy, proposed by the governor, aims “to manage energy costs, move toward energy independence and stimulate the economy”.²¹⁷ The state has committed to a “\$665.9 million investment to spur the development of alternative and renewable energy technologies and help customers and small businesses take steps to reduce their electricity

²¹⁴ The Pennsylvania Department of State, “Energy Security: The Pennsylvania Story”, http://www.dep.state.pa.us/dep/deputate/pollprev/PDF/Energy_Security_chart_rev.pdf. Accessed on June 15, 2009.

²¹⁵ The Pennsylvania Department of State, “Energy Security: The Pennsylvania Story”, http://www.dep.state.pa.us/dep/deputate/pollprev/PDF/Energy_Security_chart_rev.pdf. Accessed on June 15, 2009.

²¹⁶ Council of American States in Europe, “Pennsylvania: Energy/Renewables” <http://www.case-europe.com/stateindustries/stateindustry/EnergyRenewablesPennsylvania,114.aspx#Industries> (Accessed June 16, 2009).

²¹⁷ The Commonwealth of Pennsylvania “Pennsylvania’s Energy Independence”, <http://www.depweb.state.pa.us/energyindependent/cwp/view.asp?a=3&Q=518171&energyindependentNav=|> (Accessed on June 13, 2009).

consumption and save money”.²¹⁸ Approximately \$428.4 million will be used to encourage “the development of alternative energy resources and create good-paying, skilled jobs.”²¹⁹

To date, the Pittsburgh region and the state of Pennsylvania have been somewhat successful in growing and attracting renewable energy business. The most prominent victory was the state’s success in getting Gamesa Corp., a Spanish wind turbine manufacturer, to establish its U.S. headquarters in Pennsylvania. Gamesa is the “second largest wind energy company in the world”.²²⁰ It maintains two factories in Pennsylvania, employing over 1,300 workers.²²¹ In addition to Gamesa, smaller companies have been attracted to the region. Green Mountain Solar and Sun Power Electric teamed up to provide solar electricity to the greater Pittsburgh region. Companies from Germany and Taiwan are involved in the solar industry in Pennsylvania.²²²

Although Gamesa and other smaller companies have provided some jobs to the Pittsburgh region and Pennsylvania as a whole, it is too soon to tell how effective the state’s policies will be in stimulating the dragging economy of Pittsburgh and other steel towns. Many remain hopeful that the enormous resources being poured into the venture will be effective. However, there are

²¹⁸ The Commonwealth of Pennsylvania “Pennsylvania’s Energy Independence”, <http://www.depweb.state.pa.us/energindependent/cwp/view.asp?a=3&Q=518171&energindependentNav=|> (Accessed on June 13, 2009).

²¹⁹ The Commonwealth of Pennsylvania “Pennsylvania’s Energy Independence”, <http://www.depweb.state.pa.us/energindependent/cwp/view.asp?a=3&Q=518171&energindependentNav=|> (Accessed on June 13, 2009).

²²⁰ The Pennsylvania Department of State, “Energy Security: The Pennsylvania Story”, http://www.dep.state.pa.us/dep/deputate/pollprev/PDF/Energy_Security_chart_rev.pdf. Accessed on June 15, 2009.

²²¹ Steven Greenhouse, “Millions of Jobs of a Different Collar”, The New York Times (March 26, 2008).

²²² Steven Greenhouse, “Millions of Jobs of a Different Collar”, The New York Times (March 26, 2008).

many critics of such policies. According to these critics, Pennsylvania's initiatives and investments in renewable energy may even hurt struggling economies like Pittsburgh.

c. Critiques on the 'Green New Deal'

According to 'green economy' proposals, the central aim of such programs is to revitalize the economy through the creation of well-paid jobs. Pittsburgh and the state of Pennsylvania have based their major investments in the renewable energies industry on this premise. However, this claim is refuted by a recent study on Spain's subsidization of its renewable energy industry. Startlingly, it claims that more jobs have been destroyed than created by Spain's renewable energy programs. Spain's support for a renewable energy industry mirrors Pennsylvania's efforts in many ways. This is due to the fact that Pennsylvania based their program largely on European policies.

Continental Europe is far ahead of the United States and Britain in developing a renewable energy industry. In fact, the link between 'green jobs' and increased employment was first discussed in 1997, when a White Paper presented by the European Commission predicted that 500.000- 900.000 jobs would be created through public support of renewable energy.²²³ Since 1997, several European governments have taken action towards promoting 'green energy'. Spain is noted for its particularly aggressive commitment in terms of legislation and monetary commitment. Created in cooperation with Universidad Rey Juan Carlos and MITRE, the "Study of the Effects on Employment of Public Aid to Renewable Energy Sources" examines what it terms the 'Spanish Renewables Bubble'. According to the authors, the "Spanish experience [in renewables] is [currently] considered a leading example to be followed by many policy advocates

²²³ Gabriel Calzada Alvarez et al. "Study On the Effects of Public Aid to Renewable Energy Sources", MITRE (Madrid: Universidad Rey Juan San Carlos, March 2009) 2. <http://www.juandemariana.org/pdf/090327-employment-public-aid-renewable.pdf>. Accessed April 2009.

and politicians”, but the study marks the “first time a critical analysis of the actual performance and impact has been made” of the program.²²⁴ The study argues that the “Spanish/EU –style ‘green jobs’ agenda now being promoted in the US in fact destroys jobs”.²²⁵ Like the United States, and smaller entities like Pennsylvania and the Pittsburgh region, politicians in Spain and Europe argued that “massive public support [for the renewable energy industry] would produce large numbers of green jobs”.²²⁶ But according to the study, the majority of jobs created by Spain’s policies were short-term in nature: construction, installation, and administrative. Only “one out of ten jobs has been created at the more permanent level of actual operation and maintenance of the renewable sources of electricity.”²²⁷ The collected figures show that the subsidies applied since 2000 “have created less than 50.200 jobs”, which is “.2% of Spain’s workforce and .25% of Spain’s employed workforce”.²²⁸

These figures do not reveal the entire effect of Spain’s subsidy program. A commonly overlooked aspect of the “job creation” figures is the relationship between newly created ‘green jobs’ and jobs that would be destroyed because of renewable energy policies.²²⁹ The study on Spain is the first of its kind to look at this relationship. According to the study, the creation of green jobs in Spain “resulted in the destruction of nearly 110.000 jobs elsewhere in the economy, or 2.2 jobs destroyed for every ‘green job’ created”.²³⁰ Most of these jobs were lost in “metallurgy, non-metallic mining, and food processing, beverage, and tobacco”.²³¹

²²⁴ Alvarez et al. “Study On the Effects of Public Aid to Renewable Energy Sources”, MITRE, 1.

²²⁵ Alvarez et al., 1-27.

²²⁶ Alvarez et al., 1.

²²⁷ Alvarez et al., 1.

²²⁸ Alvarez et al., 25.

²²⁹ Alvarez et al., 3.

²³⁰ Alvarez et al., 2.

The financial costs for Spain have been exorbitant. As estimated by the study, the “total overcost- the amount paid over the cost that would result from buying electricity generated by the renewable power plants at the market price- that has been incurred from 2000 to 2008...amounts to 7.918,54 million Euros” or approximately \$10 billion US dollars”.²³² When other subsidies for the industry are added in, the total amounts to 28.671 Euros or \$36 billion US dollars. In order to pay down this debt, Spanish consumers would need to pay 31% more for their energy costs or face general tax increases.²³³ Additionally, high energy costs from the policies have resulted in energy intensive companies, like Spain’s Acerinox, relocating to reduce costs.²³⁴ Lastly, in spite of the massive amounts of resources spent, Spain’s photovoltaic industry “failed to even reach 1% of Spain’s total electricity production in 2008”.²³⁵

The study produced on Spain’s publicly-funded renewable energy industry is highly relevant to Pittsburgh and Sheffield. Although Sheffield has yet to attempt such a plan, green job proposals are becoming increasingly popular on the public policy level and will most likely affect Sheffield in the near future. Pittsburgh is in the midst of recreating a system similar to Spain. As part of a larger, Pennsylvania state initiative, the Pittsburgh region is currently participating in a subsidy and regulatory system based on those instituted in Spain, Germany, and other EU countries. If we look at a Spain’s ‘green job’ policy from an employment perspective, it has largely been a failure. This does not mean that such an industry will fail to create positive benefits in the long

²³¹ Alvarez et al., 2.

²³² Alvarez et al., 2.

²³³ Alvarez et al., 3.

²³⁴ Alvarez et al., 3.

²³⁵ Alvarez et al., 3.

term. The formation of “green” energy industries could produce important environmental benefits, such as reductions in CO2 emissions and the use of fossil fuels. However, in terms of regional economic development, heavy subsidization of a renewable energy industry may not be the best policy for “Rust Belt” cities such as Pittsburgh and Sheffield.

d. The Rhetoric and Branding of the Green Economy

In addition to the discussion on costs and job creation, it is important to quickly examine the rhetoric surrounding the ‘green job’ proposals. Many discussions about the ‘green economy’ seemed based on little fact and are eerily similar in rhetoric to previous speculation on the possibilities of the ‘knowledge economy’. Lois Quam, managing director for alternative energy investments at the investment bank Piper Jaffray, was quoted, in reference to renewable energy, as saying:

When I first started looking in to this area, many people commented on how this will be as big as the Internet. But this is so much bigger than the Internet. The only comparable example we can find is the Industrial Revolution. It will affect very business and every industry.²³⁶

Such rhetoric is common and reminiscent of the ‘one solution fits all’ discussions surrounding the ‘knowledge economy’. While the U.S. and UK lag behind countries such as Germany, Spain, and Japan in technology development, the issue in relation to cities like Pittsburgh and Sheffield is not technology; it is job and wealth creation. Interestingly, Pennsylvania has cited its frustration with the United States’ pace at adopting subsidy programs as the main reason for its state-wide adoption of ‘green job’ policies. Although it is impossible to make any direct comparisons, the history of Spain’s renewable energy industry suggests that Pennsylvania’s large investment in renewables may be disappointing in terms of job creation. Pittsburgh is successfully branding itself as a burgeoning “green economy” because of its investments.

²³⁶ Steven Greenhouse, “Millions of Jobs of a Different Collar”, *The New York Times* (March 26, 2008).

However, other than a manufacturing labour force, both Pittsburgh and Sheffield lack an initial base upon which this new industry can be built. Policymakers and residents continue to hope that a single industry can replace steel with similar high-paying, manufacturing jobs. The history of the global economy indicates that this is unlikely as diversification of the economy becomes increasingly prevalent. Additionally, the short history of the publicly funded renewable energy industry does not support the assertion that such an industry will result in large-scale employment opportunities.

XII. Conclusion: The Future of Economic Development in Pittsburgh and Sheffield

The current economic statuses of Sheffield and Pittsburgh are closely linked to the cities' manufacturing pasts. The manufacturing steel industry was initially attracted to the cities because of their natural resources and topography. Sheffield and Pittsburgh developed in conjunction with their respective steel industries and the landscapes of the regions adapted to the industries' needs. As a result, the two cities became suburbanized, fragmented, and overly-specialized in steel.

When the steel industry declined, the economic logic of Sheffield and Pittsburgh's geography disappeared. Policy-makers tried to remedy the situation by artificially prolonging the life of inefficient steel mills. When the subsidies ceased, Sheffield and Pittsburgh were unprepared for the sudden and exacerbated restructuring of their economies. Differing economic development policies sent the two cities down slightly different economic paths. While Sheffield failed to develop early public-private partnerships and long-term development plans, Pittsburgh succeeded in working with private industry and encouraging the creation of a health technology cluster. Despite these differences, both cities are still hindered by their spatial compositions and primarily blue-collar labour forces. Pittsburgh and Sheffield have repeatedly failed to address these issues from their manufacturing past. Perhaps, most significantly, neither city has relinquished the hope of regaining its reputation as an economic powerhouse. Previously known across the globe as "Steel Cities", Pittsburgh and Sheffield have struggled to rebrand themselves as economic leaders- first as a leading "Knowledge Economy" and now as a "Green Economy".

The key to Pittsburgh and Sheffield's economic progress, however, may be in accepting the reality of their respective histories and current economic situations. The great transformations of the twentieth century global economy transformed the economic geography of the world. In

the United States and Britain, other regions rose to economic power as cities like Pittsburgh and Sheffield lost significance. One economist, Professor Tim Leunig of the London School of Economics, has gone so far as to suggest that struggling cities in Britain give up any hope of true revitalization. In his study “Cities Unlimited”, Leunig argues that such cities have lost their economic and geographical logic and show little promise of being powerful in the modern economy.²³⁷ Instead, he suggests that the government limit its economic renewal funds and, instead, encourage residents to migrate to strong hubs like London to take advantage of the economic clusters and interactions.

While an “abandoning” of Sheffield or Pittsburgh is hardly politically feasible, and possibly unwise, there is some important truth in Leunig’s argument. It is improbable that Pittsburgh or Sheffield will regain their former population numbers or economic dominance. That hope is not only naïve, but damaging. As seen in the experiences of Sheffield and Pittsburgh, the intentional preservation of outdated economic structures and misguided policies exacerbated an already difficult economic situation. Instead of once again developing an economy based on a single industry, Pittsburgh and Sheffield may benefit from actively diversifying. According to economist Gregory Hamilton, broad-based economies are better equipped to weather changes in the increasingly global economy. With a diverse economy, “one area of a region’s “economy [can] go south, [and] another can pick up the slack”.²³⁸ While a diversified economy helps a region avoid industry specific economic busts, it also tends to preclude industry-specific

²³⁷ Tim Leunig and James Swaffield, “Cities Unlimited: Making Urban Regeneration Work” ed. Oliver Mark Hartwich (London: Policy Exchange, August 2008), http://www.policyexchange.org.uk/images/publications/pdfs/Cities_Unlimited.pdf, Accessed 05/2009.

²³⁸ Mark Hengel, “State's economy offers protection: Arkansas' diversification blunts effects of U.S. recession”, *Arkansas Business*, Jan 19, 2009. http://findarticles.com/p/articles/mi_hb5248/is_3_26/ai_n31485387. Accessed September 9, 2009.

economic booms.²³⁹ However, in the cases of Pittsburgh and Sheffield, the cities may derive more value from a steady, diversified economy than a risk-orientated, single-industry economy.

The economic histories of Pittsburgh and Sheffield demonstrate the dangers of denial and delusion in urban economic planning. The cities may never again be world-famous, economic hubs. However, with an understanding of their economic pasts and a wise, but modest, approach to development, it may be possible for Pittsburgh and Sheffield to overcome their “steel hangovers” and develop diverse economies which serve their existing populations.

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²³⁹ Ibid.

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EDUCATION

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Studies for Juris Doctorate began in Fall 2009.

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Masters Degree in Global Studies. Granted and supported by the EU Erasmus Mundus Program

GOETHE INSTITUTE, Berlin, Germany March 2009
Completed an intensive academic program on German.

THE LONDON SCHOOL OF ECONOMICS AND POLITICAL SCIENCE, London, UK September 2008
Masters Degree in Global History from the Economic History Department. Conferred *with Distinction*.
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* Coursework Includes: The Development and Integration of the World Economy in the 19th and 20th centuries, International Economic Institutions since World War I, Economic Change in Global History, Pre-modern Paths of Growth: East and West compared.

UNIVERSITY OF CALIFORNIA, LOS ANGELES, Los Angeles, CA June 2007
Bachelor of Arts in History, *summa cum laude*, 3.98 GPA

- Coursework Includes: Migration and Ethnic Minorities in the European Union, Ethnic Conflict in the Twentieth Century, History of War and Diplomacy, EU Foreign Policy Analysis, EU and the Muslim World, Bioterrorism and Emerging Diseases, History of the Middle East, Western Civilization, and History of the Ottoman Empire.
- Studied abroad in conjunction with Albert-Ludwigs Universitat in Freiburg, Germany. Studied EU policy and researched at EU institutions in Western, Central, and Eastern Europe.
- Studied Ancient Roman History and Art History in Rome with UCLA.
- Honors: Scholarship winner the LSE Grimshaw Society's academic study trip to Russia, European Union Erasmus Mundus Scholarship for Global Studies Double Masters 2007-2009, One of two UCLA Nominees for 2007-2008 Carnegie Endowment for Intl. Peace Junior Fellows Program, Ahmanson Research Scholar, UCLA Dean's List, Phi Alpha Theta History Honors Society, UCLA Pre-Law Society

EXPERIENCE

INTERNATIONAL INSTITUTE OF LOS ANGELES, Los Angeles, CA October 2006- June 2007
Legal Services Research Intern

- Research and compile support for refugee and asylum cases.
- Assist in lobbying political representatives and governmental organizations.
- Organize meetings with an international cliental and serve as communications liaison to potential clients.
- Aide clients in writing declarations.

UNIVERSITY OF CALIFORNIA, LOS ANGELES, Los Angeles, CA January 2007- July 2007
History Department Research Assistant

- Conduct historical research in the UCLA libraries.
- Work on a variety of topics, including history of architecture.
- Compile, analyze, and summarize sources and materials.

AZC ASYLUM SEEKER CENTER, Markelo, Netherlands August 2006 - September 2006
Human Rights Workshop and Youth Programs Coordinator

- Work with residents of Dutch Government asylum seeker camp.
- Research asylum cases
- Create recreational programs for children of all ages and organize a human rights' workshop.
- Work with international volunteers and language barriers.

DISNEYLAND, Anaheim, CA

January 2003 - June 2006

Entertainment Host

- Act as liaison between guests and entertainment employees. Work with a multilingual, international clientele.
- Diffuse conflicts and developed creative solutions to problems
- Work collaboratively to address guest concerns and questions about the department and characters
- Make risk assessments and quick decisions concerning guest safety, satisfaction, and conflicts within a fast paced environment.

SOR PRODUCTIONS, Hollywood, CA

December 2004 - June 2005

Research, Development, and Marketing Intern

- Conduct detailed research for various documentary subjects, such as mail order Russian brides in America.
- Develop marketing materials and create client contacts for newly released documentary films in the educational market
- Correspond with university academic departments and officials across the nation in regards to viewing and purchasing films.
- Produce detailed transcripts of conducted interviews and create editing logs.

UNIVERSITY OF CALIFORNIA, LOS ANGELES, Los Angeles, CA

December 2003- December 2004

Academic Tutor

- Provide comprehensive overview of historical theory, concepts, and researching skills.
- Arrange weekly meetings with multiple tutees.
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RECENT EXTRACURRICULARS

DEPARTMENT OF ECONOMIC HISTORY, STUDENT-STAFF COMMITTEE, LSE*Chairperson*

Chairing meetings on the department's curriculum, administrative policies, and recruitment efforts.

INVESTMENT SOCIETY, LSE

Attending Investment workshops and panels

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Organizing seminars and panels addressing successful strategies for women in business.

ADVOCATES FOR ASYLUM REFORM, UCLA

Co-founder and Chairman.

Advocating policy change and providing the UCLA community with opportunities to work with asylum seekers.

DARFUR ACTION COMMITTEE, UCLA

Steering Committee and Legislative Liaison

POLARIS PROJECT, UCLA CHAPTER

Educating the community on human trafficking and creating outreach programs.

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