

Systemic Decline in British Shipping 1870-1960

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Abstract: This paper discusses the decline of British shipping in the twentieth century by focusing on the sources of its competitive advantage and the forces that lead to their erosion. British shipping gained much competitive strength from the broader economic system of which it was part, and gave birth to heuristics on how to perform in the industry if one is to succeed. The decline was systemic in that many competitive advantages were born from the greater economic system of which the industry was part. In the twentieth century, sources of competitive advantage became sources of entrapment, and the old heuristics buttressed by environmental forces, continued to affect decision making.

Keywords: heuristics, competitive advantage, industry structure, shipping, diamond

JEL Classifications: L16, L25, L91, N77, O14

1. Introduction

Seventeen years after its release, Porter's Diamond remains a persuasive tool for analyzing industrial performance. In recent years, it has been applied to Puerto Rico (Vega-Rosado 2006), Ireland (Clancy, O'Malley, O'Connell and Van Egeraat 2001), Korea (Jin and Moon 2006) and Brazil (España 2004). The model argues that competitive advantage relies on relentless improvement and innovation in the firm's products and processes (Porter 1990:67). Domestic environmental forces provide the pressures, incentives and capabilities for firms to improve and innovate. These forces are embodied in the Diamond which encompasses four key determinants; factor conditions, demand conditions, related and supporting industries, and firm strategy, structure and rivalry.

According to Porter, the full diamond does not work in all nations, as it depends on their stage of development. Nations go through a four stage path of development; the first being the factor-driven stage in which success is based on factor endowments that provide cheap labor or low cost natural resources. The second is the investment-driven stage characterized by investment in infrastructure and new industries. The third stage is innovation-driven, where the full diamond is in place in a wide range of industries and the nation is achieving sustainable prosperity. The last is the wealth-driven stage in which a nation lives on its past and goes into decline. In this stage, a number of factors cause firms to lose competitive

advantage. These include ebbing rivalry, declining corporate motivation, and the acquisition of power by firms with which they can influence government policy to insulate themselves. There are fewer entrepreneurs in this last stage, as companies are headed by stewards who give more attention to preserving company position than enhancing it.

Porter's model has attracted a lot of criticism. Yetton, Craig, Davis and Hilmer (1992) observed that the Diamond has little to do with the performance of New Zealand and Canada. The latter has a strong resource base and has achieved sustained economic growth despite lacking a strong diamond and being at the first stage of development. By contrast, New Zealand's performance has been less impressive but this is suggested to be more due to size and isolation, rather than lack of a diamond. They also criticize the model for its emphasis on the domestic economy, and the implicitly assumption that competitive useful learning can only occur domestically. In an age of globalization, the domestic orientation is suggested to have less validity, hence Moon, Rugman, and Verbeke (1998) have modified the model to provide an additional diamond representing international or multinational activities. Howard and Ellis (2006) surveyed five articles and found only one that supported the diamond. Porter's methodology has been criticized for supplying 'a shower of anecdotes and suggestive hypothesis rather than theory development' (Ingram 1991:50). Finally, the report is criticized for being biased towards successful industries and there is no way to check whether patterns exist in industries that fail.

This paper examples the British shipping industry between 1870 and 1960, a period in which it achieved global domination followed by significant loss of competitive position. Porter pays attention to the relative decline of British industry in chapter 9 of his book. He said it had entered the wealth-driven stage of decline. However, shipping escaped his attention. This industry is well suited for theory testing and development as few industries are so well documented over such a long time frame. It reveals features consistent with evolutionary economics with persistence of routines, heuristics and relationships.

The definitive work on the decline of British shipping by Sturmev (1962) focuses on internal constraints acting on the industry's development but, this paper suggests that much of the decline was systemic in that many of the competitive advantages were born from the greater economic system of which the industry was part. Analyzing industrial decline with an emphasis on external factors lends itself to the work of Porter (1990). The first section of this paper examines the forces behind Britain's competitive success in the steamship industry and how those forces gave rise to heuristics and ways of thinking about competition. Section two examines how the British pursued the same ways of thinking in the face of changing technologies, markets and organizational forms. Section three examines the external forces that buttressed prevailing behaviors. The decline in the twentieth century is discussed by focusing on the sources of its competitive advantage and the forces that lead to their erosion.

2. Sources of Competitive Advantage

Britain's eminence in the nineteenth century is consistent with Porter's Innovation-driven stage. It is a period marked by innovation in a number of areas including technology and organization. Innovation in technology drew strongly on related industries consistent with Porter's model. Britain's early lead in steamship technology reflected the coal, iron and engineering development on land. The capital items used in steamships were produced in greater quantities in Britain than in any other nation. Marine technology was an extension of the industrial cluster already blossoming on land. The engineers who designed machines for use at sea co-operated and formed learned societies with their railway and general engineering counterparts, providing a cumulatively growing pool of knowledge and experience.

Steam-engines freed shipping from its reliance on winds and ocean currents. Ships could travel where they wanted, when they wanted. In the late nineteenth century, steamship technology improved, reducing the costs and increasing range. These improvements came from improved machinery which reduced coal consumption and staff required to stoke the

engines, the building of larger ships which meant bigger loads could be carried without a corresponding increase in labor requirements and, the cost of building ships decreased with advances in the iron industry which reduced the price of iron.

The government plays a partial role in Porter's diamond but it played a significant role in the diffusion of steamship technology. An important form of government assistance was the subsidy given to ships carrying mail. To get a mail subsidy, a company had to fit in with the requirements of the admiralty who took a strong role in guiding and promoting the new steam technology. These subsidies contributed 20-40% of operating costs (Hope, 1990, p.272) and were vital in establishing transoceanic steamships as a viable commercial prospect.

The government's policies in empire creation also aided diffusion of steamship technology through the development of long distant trades. British steamships traveled to foreign ports where British-built railroads provided another key artery in the commercial system opening up the hinterland of places such as Canada, India, South Africa, Malaya and Australasia. As the colonies became richer from their exports to Britain, they in turn became a ready market for Britain's manufactured goods. The resulting commercial system developed reinforcing arms of commerce, industry and shipping, the lead in one field reinforcing her strength in the others. British advances in railway, steam ships, and iron hulls provided the technologies by which trade volumes soared. Wealth generated by the industrial revolution found itself on London capital markets and finance railways, cold-stores, plantations and other transportation facilities.

Government changes in legislation also led to innovations in organizational form. The East India Company's monopoly came to an end and the Asian trade was thrown open to competition. The Navigation Acts were repealed in 1849, which did away with the inefficiencies of older legislation. Another legal change affecting organizational form and the ease of raising capital was the limited liability legislation which gave birth to scores of one-

ship joint stock companies, often owned and managed by small groups of investors (Hope, 1990). The new laws meant that if the ship made a loss, liability was limited only to that ship and company (Green, 1985). This encouraged entrepreneurs with capital, connections or experience in trades (perhaps from serving in the East India company) to seize the opportunities the new technologies and legal protection gave.

Many investors established family firms, some with partners, particularly in tramp shipping. Tramps were a highly flexible form of shipping that did not sail to a fixed route or schedule. They sailed to where ever there was a cargo. This form of shipping enjoyed an annual growth rate of 7% percent between 1870 and World War One (Hope, 1990). Tramp ships traveled the world, where and when the cargoes dictated. It was a form of shipping made possible by the development of telegraph technology which informed shippers in advance where cargoes lay. Telegraph and Cable made communication easier and took a lot of the risk out of business as goods were sent less by speculation and more to order. It also allowed an increase in contact between the buyer and seller, with the elimination of the middleman. This led to reduced prices and increased business. Brokers had almost complete knowledge of the rates being paid in the main chartering centers for the various trades and the ships receiving those rates. This open information, large number of firms, and relatively low costs of entry made the tramp market highly competitive. In this fiercely competitive environment, tramp owners were characterized as hard-driven businessmen fiercely competing with other ship owners (Sturmey, 1962). By 1914, tramps constituted 60% of the nation's fleet (Hope 1990, p.338).

The remainder of the fleet mainly comprised liners. Liners sailed to a regular schedule thereby increasing the value they provided to customers with a regular and reliable service. The idea of running at a specific time regardless whether the ship had a full load involved considerable risk but, this was more than offset by attracting better paying cargoes such as cabin passengers and mail (Davies, 1985). The greater number of sailings also allows liners to gain greater usage from ships that would otherwise be under-utilized. Steamships were

well suited to scheduled sailings as they were not restricted by wind conditions. In the early days, steamships involved a substantial investment that was beyond the small player. For that reason, the principal mail and passenger lines were created as chartered companies from the start.

However, the negative effects of strong competition on the liner trades were often felt and helped shape organizational form. As early as 1850, some companies felt the need to cooperate on minimum freight rates (Hope 1990). The movement to inter-company agreements gained space in the difficult years of the 1870's when the opening of the Suez Canal dramatically reduced the length of voyages to the East and the total number of ships needed. The surplus of ships on the world market contributed to some defensive maneuvers by shipping companies. Competing lines frequently amalgamated, either through merger or take-over, giving birth to lines such as Union-Castle, Shaw Savill and Albion, and Elders and Fyffe date from this period. This process of amalgamation increased the merged firm's resource base and market power. A second defensive option was to limit the competition between them by forming conferences. A shipping conference is a cartel in which shipping lines operating on similar routes agree to regulate competition between themselves and restrict new entrants from competing on the route. Many shippers were naturally discontented with this situation but the conferences had a positive effect on stability of rates, regularity of service and improved facilities (Davies, 1985).

The process of amalgamation and conference building did not hit the tramp industry. Tramp owners were the more individualistic side of the industry, conducted by businessmen who held a personal pride in the achievements of the ships that bore their family name. They held a personal incentive that the managers of large liner companies lacked. Liner companies were run more and more by people with skills in accounting and negotiating, whose office work increasingly distanced themselves from the every day running of the ships. They welcomed

co-operative action with other companies. Consequently, the English shipping industry bore two structures; one oligopolistic (liners), one perfectly competitive (tramps).

Factors of production were an important source of competitive advantage, especially the coal industry. Britain had a huge natural endowment of coal, providing the energy source by which many of the new industries were powered. Fletcher (1975, p.4) describes the coal industry as “the cornerstone of British maritime supremacy”. It fuelled the construction of ships, the fuelling of ships, and gave the British an export cargo that allowed it to charge lower rates on return journeys.

British shipping rose on the support of the most advanced supporting industries of the day including ship-building and the most advanced cargoes. These industries grew into Marshallian districts deriving significant economies of scale. In these centers of industrial activity, pools of specialized labor were constantly available to any employer in the region through the local labor market. The concentration of so many firms in a region meant that common standards of worker training and qualification would be available to all employers.

Given the high quality of labour available through the market and the fact that training and organisation was performed by senior workers, administration costs for the firms in these districts were very low. Employers did not need to invest in managerial or planning skills. Firms remained relatively small and were family owned and managed. They concentrated on a narrow range of products in which they specialised. The low capital requirements of firms made entrance to the industry relatively easy while competition between firms helped to maintain standards. This industry structure has been labelled ‘Proprietary capitalism’ (Lazonick, 1991) and Personal Capitalism (Chandler, 1990), the key characteristics being Marshallian districts of industry concentration where firms enjoyed external economies in which a large number of firms shared infrastructural investments in communication,

distribution and training. These firms were vertically specialised, horizontally fragmented, proprietary firms with low overheads and highly skilled craftsmen.

A key supporting industry was ship-building which became concentrated in three areas, the Clyde, the north-east coast and Belfast. Pioneers in steamship construction came to the industry with iron-coal engineering skills. David and Robert Napier were pioneering entrepreneurs with backgrounds as blacksmith and iron founder (Smith, 1980). Their first shipbuilding yard was on the Thames; however in 1841 they moved to Govan on the Clyde River, launching the region's great tradition of iron shipbuilding. The Napiers provided their employees with the engineering capabilities required in the industry and, from their works came a new stream of entrepreneurs. Employees of Napiers who spun-off to start their own businesses include William Denny, J and G Thomson, David Todd, John MacGregor and John Elder, who patented the marine compound engine. The head start obtained by the British enabled them to build up economies of scale that made it hard for foreigners to compete. The steel industry could make longer production runs, thereby reducing costs (Pollard and Robertson, 1979). The large market made it possible for shipbuilders to specialize in certain types of ships, particularly in the building of tramps. This allowed shipbuilders to economize on the equipment they needed and allowed them to build before orders had arrived. By 1850 the reputation of the Clyde was attracting shipbuilders from other places. By 1876, there were more iron ships built on the Clyde than the rest of the world put together (Pollard and Robertson, 1979).

Many of the new steamship companies formed strong associations with shipbuilders. Shipbuilders gained repeat orders and an opportunity to specialize in certain types of ships. In return, the ship owners received vessels at lower prices (Pollard and Robertson, 1979). For example, the White Star Line completed an agreement to have all their steamers built and designed by Harland & Wolff in Belfast (MacKenzie Kennedy, 1993). In return, the shipbuilder offered not to build ships liable to compete with White Star services. The two co-

operated with their ideas. The flow of information contributing must have contributed to the line's ability to meet the market with hitherto unknown standards of comfort. For example, their ship designs re-located first class cabins amidships, clear of machinery and propeller vibration.

British shipping gained much competitive strength from the broader economic system of which it was part. Britain was the leading industrial nation on the basis of a reinforcing industrial cluster of iron, coal, textiles, and steam power. As the population and industrial production increased, so too did the demand for imports of raw materials, which created a derived demand for shipping services. The increasing world trade centered on London encouraged people to invest in the new technology. As more of the nation's industrial output was sold abroad and demand for imported resources climbed, shipping grew in volume and competitiveness. With this, came an expansion of skills, knowledge, expertise and reputation. As British industry rode an increase in world trade that it was doing so much to shape, the profits provided capital with which British firms could invest in the latest technological improvements. The competitiveness intensified the pressure to reduce costs and improve quality (Starkey 1993). It created a competitive compulsion for innovation consistent with the writings of Klien (1977) and Porter (1990).

On the basis of their comparative advantages, Britain achieved global supremacy and developed a business mentality that buttressed their success. Businessmen learned that success could come from following particular lines of thinking such as the need to use the reliable all-purpose tramp, and recognition of the highly skilled practical men who made them. Figure.1 lists some of the heuristics stemming from this outlook.

With the most sophisticated ships, and devices such as conferences, the British defeated their foreign competition. British tonnage, which stood at 2.77 million tons in 1840, grew four-fold in seventy years, to 11.56 in 1910 (Davies, 1985, p.69). By the middle of the nineteenth

century, Britain produced ‘about two thirds of the world's coal, about half its iron, five sevenths of its steel, two fifths of its hardware and about half its commercial cotton cloth’ (Kennedy, 1988, p.152). Its’ iron and coal driven merchant fleet, that carried manufacturing goods out and raw materials in, was by 1890 larger than the rest of the world put together. It was part of a reinforcing system of coal resources, flexible family firms, Marshallian districts and practical craft workers. Ships built on the Clyde were chartered and insured in London where Lloyds achieved a position of leadership. In London, the City's financial institutions provided the capital by which the system advanced.

Place Figure.1 about here

3. British Entrapment

In 1890, over 10 million tons of shipping sailed under the British flag, a phenomenal amount representing approximately 50% of the global total (Sturmey, 1962, p.4). Yet, over the next half century, the British share of world shipping declined dramatically. By 1960, its market share had fallen to 16%, soon to decline even further. Total British shipping had grown to nearly 21 million tons, but it had failed to ride the development paths that others used to dethrone Britannia. There are two principal explanations for this. Sturmey (1962), in his definitive study, focuses on barriers to growth within the British industry. For Sturmey, the critical period for British shipping was between 1920 and about 1958 when tremendous changes occurred in trading patterns, competition, ships, cargoes and passengers. The British industry was slow in adapting itself to these changes. It was an industry geared to maintaining its position of supremacy, not to the meeting of changes. When it woke up, the world had moved. By contrast Davies (1985) suggests that British shipping reflected the state of the British economy in general. For Davies ‘shipping is an integral part of a nation’s economy and accurately reflects both its relative efficiency and its international competitiveness’. As the British share of world trade declined so did its shipping. Both explanations are considered in light of Porter’s model.

British competitive advantage had been based on supportive government policy, superior technology and organization, supporting industries, skills, experience and reputation. The last three of these were lost as other nations caught up and acquired the skills and experience to compete. Eventually, the other sources of competitiveness also disappeared.

3.1 Declining diffusion of Technological Innovation

In the first half of the twentieth century, the British steamship was challenged by the arrival of two technological options. These were the replacement of coal with diesel-oil as a fuel, and the replacement of the steam-engine with the internal combustion motor. Although the UK played a significant role in the development of these technologies, British ship-owners were slow in diffusing them. British shipbuilders as a whole remained wedded to the steamship and with some reason. Early diesel engines had a tendency to break down under less than ideal conditions whereas, the tramp steamer had been improved to the point where it was efficient, reliable and economical (Fletcher, 1975).

Even as technological bugs were removed, there still remained uncertainty over the availability of oil. 'For every person who asserted that the future would provide abundant supplies of low priced oil, there were several to announce either the world's supplies of oil would shortly give out, or that the trusts controlling its distribution would never allow the using public the advantage of low prices' (Ibid, p.6). Some shippers hedged their bets by building vessels that could burn either coal or oil while, some advocates of coal refused to give in without one major last ditch effort promoting pulverized coal with its advantages of efficiency, saving of labor, and steady steaming conditions but, it suffered from technical drawbacks.

During World War One, many navies around the world, including the British turned to oil helping to remove these uncertainties. However, this did not lead to mass conversion. One

reason was timing. During World War One, a large proportion of the British fleet was destroyed and British owners could have taken the opportunity to buy replacements that embodied the new technology. However, with a shortage of ships, freight rates were very high and owners were keen to take the ships most readily available. That meant locally produced steamers, ships built during the war, and foreign acquisitions (Fletcher, 1975). Consequently, by the 1920s, when questions of oil availability and reliability had been solved, these businessmen found they had high levels of investment sunk into the old technology - a situation augmented by a shipping depression in the 1920s that shattered investment possibilities in any new shipping technologies. Consequently, in 1925 motor ships accounted for only 3.9% of British merchant fleet compared with 21.4% Sweden, 18.1% Denmark and 12.9% of Norway's (Robertson, 1988, p.193).

Although uncertainty over oil supply may have been solved, other uncertainties remained. As late as the 1930's the case for the motor-ship was still not clear cut. The Liverpool firm of T&J Harrison (the Charante Steam Ship Company) looked very carefully from 1925 onwards into the potential of motor ships to enhance its profitability (Robertson, 1988). Their research was governed by the principle that 'any innovation must improve their expectation of profit over the whole range of trades in which the company was involved'. They also conducted tests on a number of means of propulsion and applied DCF investment analysis, yet continued to order coal-fired steam engines in the 1930's. In this instance, it was also necessary to consider, among other things, routes traveled. Motor ships were not always the best buy. In 1935, motor ships still only accounted for 16.6% of the British fleet compared to 48.6% in Sweden, 41.9% in Denmark and 36.6% in Norway (Ibid). Scandinavians were also using faster ships than the British who seemed to hold a genuine belief that slower ships would provide a superior economic performance (Sturmey, 1962). However, this belief may have been an act of faith that helped resolve cognitive dissonance.

A factor not considered by Porter was the way that factor endowment may restrict innovation. Favorable resource endowments contributed to British persistence with the coal-powered steam-engine. The principal economic advantages of oil were it required less space and had lower fuel consumption (Fletcher, 1975, p.5). Savings of 30-50% in fuel made the new technology attractive, particularly for countries like Norway which had to import its fuel. The United Kingdom had high quality coal, and no oil, therefore the economic advantages were not so great for them. The difference was probably not just transport costs but, the sense of certainty in the fuel that the British environment provided. This is an example of Salter's (1966) observation that diffusion of technology can be affected by variations in local factor costs. Short time horizons of businessmen also affect investment decisions. The reluctance to switch also reflected a preoccupation with lower first costs than in longer run economies of operation.

In contrast to the hesitation of British businessmen, the Japanese government actively promoted the building of these new 'crack ships'. However, Sugiyama (1985) states that the government was sometimes more motivated by prestige in its attempt to upgrade the quality of tonnage, and adopted diesel-powered motor ships even if it did not always guarantee the expected profit. The first attempt by the Japanese to use diesel motors was in 1923 when OSK trialed one in a small vessel operating on an inland sea route. This success led to their deployment on emigrant ships traveling to South America. The successful introduction of diesel by these major companies was followed by the competitive introduction of large, modern, high speed ships. OSK ships achieved record speeds to New York through the Panama Canal, providing a successful operation carrying raw silk and vegetable oil, earning a profit even in the midst of the depression (Nakagawa 1985). OSK's success with high speed ships stimulated research at the government's Naval Architecture Experiment Tank where it was discovered a single screw ship with an appropriately designed hull, rudder and screw could save 15% on fuel requirements. The new technology was immediately applied by the

major companies who used them on the New York route, a route characterized by high value cargoes and speed was a competitive weapon.

The British Government also introduced a number of initiatives to help their industry. In 1935, it introduced a scrap and build plan whereby ship-owners were provided with loans if they scrapped old tonnage and replaced it with modernized ships. However, unlike in Japan where a similar scheme led to some fleet modification, English ship-owners were slow to respond and the scheme was abolished. Admittedly, part of the scheme's failure was a result of changing circumstances when an increase in activity made it economical to use old ships (Sturmeay, 1962). The government also provided bounties to assist ship owners and forced the industry to set up a Tramp Shipping Administration Committee to promote co-operation among shipbuilders. The committee had some success in limiting some of the negative effects of competition during a period of very low rates. However, the British government had less influence over its much larger industry than its Japanese counterpart, and forces of decline continued to set in.

3.2 Changing Markets (Specialization and emerging routes)

British shippers were slow to respond to changing demands in global shipping. They had learnt from experience that they were the world's most competitive shippers. Having been in this position for so long, the generally accepted fact was 'that the British industry was best by definition' (Sturmeay, 1962, p.96). By the time that international competition became serious, the idea was so embedded that the crumbling of that paramouncy occurred almost unnoticed. British shippers persisted with the industry norms that had carried them to global leadership. They continued to provide all purpose vehicles while other nations created more specialized vessels to meet the needs of particular trades. For example, Scandinavians made increasing use of refrigerated holds for the Mediterranean fruit trade. They showed a flexibility and entrepreneurial attitude in sharp contrast to the British who clung to traditional attitudes.

The fastest growing category of specialized vessels was oil tankers, a reflection of the booming demand for oil. World tanker tonnage soared from 11 million tons in 1939 to 38 million in 1960 (Sturmey, 1962, p.262). Yet the British were slow to seize these opportunities despite the fact that the British admiralty and oil companies owned half the world's tanker fleet in 1913 (Ibid 1962, p.74). British ship-owners were entrapped by an aesthetic of what constituted a good ship. They were experienced with all purpose carriers and they were aware of their versatility. To the British ship-owner, tankers weren't real ships but, "floating pieces of pipeline" (Hope 1990, p.369). When the British oil company, Anglo-Saxon sold off its tanker fleet to raise capital for exploration and transportation, it was the Norwegians who bought the vast majority, not their fellow countrymen (Sturmey, 1962).

By contrast, the US was making a huge investment in tankers. Oil companies such as Sun Oil vertically integrated into shipping, building and purchasing tankers to meet their own transportation needs (Heinrich, 1997). This section of the market provided rapid growth for the US industry, a consequence of the rising demand for oil. Between 1914 and 1923, the US tanker fleet grew by 1,400% in number and 2,500% in tonnage (Bauer, 1988, p.290), although many of them would later fly under flags of convenience i.e. Liberia, Panama and Honduras.

Up and coming competitors, Japan and Germany grew by exploiting new trading opportunities arising from South American independence, immigration, and Pacific routes. The United Kingdom felt no losses from these developments; in fact the British had largely ignored Pacific routes. This provided a window of opportunity for the imitators to develop their maritime capabilities. When the First World War redirected British commercial shipping towards the war effort that window of opportunity widened for Americans and Japanese. The Pacific became a Japanese lake.

3.3 The Role of Rivalry

Porter's emphasis that a decline in competition leads to slower innovation is supported by the liner part of the market which exhibited many of the characteristics he identified in the wealth-driven stage. Sturmev (1962) notes that the little effort to investigate the economies of faster ships and other areas of improvement can be attributed to the industry structure in the liner trades. The conference agreements provided stability but gave little incentive to break from conventional modes of thought. The barriers to entry associated with the conference helped maintain British tonnage at a high level but, in the long term, increased inefficiency. Liner companies in the cartels avoided aggressive competition and had an overwhelming tendency not to take an action which might invite reprisals. By contrast, foreign operators with little market share were not restricted by these fears, and enthusiastically seized opportunities to win trade from increasingly inefficient liner-companies.

Flexibility was also hampered by the distance that managers of these companies were now from their core activities and information on the industry. Industry growth and reduced competition had helped to distance ship owners from ships and the smell of salt (Ibid: 395). Leading ship owners were more accustomed to co-operation rather than aggressive competition. The large organizations isolated the owner from the shipmaster and the associated commercial intelligence. Working from offices they increasingly judged operations through balance sheets rather than the detailed competitive problems on any particular route. A reflection of this change was the increased social position that ship owners now held. They became socially important figures, the purchasers of land and the recipients of titles or, as Weiner (1981) would put it, they had gone through a process of gentrification. As we will see in the next section, this was a feature of the broader economic system of which shipping was part. The result was a business elite distant from its core activities and problems. It augmented an arrogance that beset the industry. This is an example of what Marshall (1890) was personally witnessing when he wrote his life cycle of the firm.

Long term adaptability was also hindered by the organizational-management structure of the companies in which families had emerged as entrenched stake-holders. Even when companies merged, family members from the old merged companies still dominated the board of directors. Family management made the industry less attractive to people who had the ability and ambition and the industry suffered from a shortage of good management (Sturmey, 1962).

Given the emphasis that Porter (1990) placed on rivalry, the highly contested tramp side of British shipping might have been expected to show more innovative vigor than the liner trade. However, the competitive model did not prove to be show the longevity we might expect from orthodox economic theory. In fact, British tramp shipping was routed. Tramp shipping which at the beginning of the century comprised 60% of the fleet was down to less than 20% of a similar total (Davis 1962, p.361). There are a number of reasons for the demise of British tramp shipping however, standing out is the fact that continuing with past commercial rationalities and paradigms proved a far stronger force on the industry than the benefits of competition.

As a high wage nation, British tramp owners needed to keep at least one step ahead of low wage competitors in the adoption of larger and faster vessels yet, by 1914, advance had practically stopped as the industry accepted the reliable economical ships as the embodiment of the ideal tramp. The reliable tramp ship was an excellent trader with which they learned to maximize economies. They knew these ships well so built their strategies around them. Use of their technology became a core heuristic. As Sturmey (1962, p.78) notes ‘The tramp-owners as a whole were cheese-paring by nature, meeting competitive pressures by continuous economies within traditional ship types, but rarely taking a longer view and endeavoring to reduce costs (or increase receipts) by spending money on ships designed for existing conditions’.

This outlook was particularly damaging when ships were dramatically increasing in size. Size offered a number of economic advantages (Hope, 1990). In 1968, a 5000 ton ship would cost 85 pounds per ton to build compared to 35 pounds for a 20,000-tonner. A large ship might require an engine 10 times more powerful but, it could carry 40 times the weight of cargo. Average running costs also declined with size, for example above 65,000 tons crew costs remained static. Although these figures come from later in the twentieth century, they reveal an economic phenomenon that had been occurring throughout the century. The British did not invest in larger ships

One possible explanation is the small size of British ports which limited their ability to handle large tankers and bulk carriers. Sturmev (1962, p.166) notes that ‘ship owners were unduly conscious of the limitations of the British oil terminals in handling the biggest tankers’. However, given the fact that a tanker on international routes might never visit Britain, the decisions are an example of bounded rationality and perhaps availability bias, in which the readily available and observable information is given un-justifiable cognizance. The result is a false consciousness, an example of the local environment restricting a more rational view of global change.

Family tramp firms lacked the necessary capital to switch to large ships such as tankers (Sturmev, 1962). The possibility of raising money through debt or issue of shares existed but the industry had a tradition of self financing. Like other proprietary corporations of the time, they avoided outside capital in order to retain control of the company within the family. The shunning of outside finance was also a reflection of business norms. These companies had grown from small beginnings by reinvesting profit. External finance was never a key factor in their mental outlook. In fact, during the nineteenth century some companies did take the opportunity to borrow but, heavy debt left them vulnerable during the depression of 1904-11. Many lines failed and the unwritten rule became financial conservatism. Consequently, the

small owner of two or three tramps saw investment in tankers as a risky and high debt project compared to what he knew he could do best.

The company that was most responsible for imbuing ship owners with a conservative stance was Royal Mail. On becoming chairman of the Royal Mail group, Owen Philipps (later Lord Kylsant) commenced an expansionary program which saw the company's tonnage grow from 92,352 grt in 1903 to 165,511 in 1906. The company continued to expand and acquired a number of companies including Elder Dempster & Co in 1910, Pacific Steam in 1910, Glen Line and Lamport and Jolt in 1911 and Union Castle in 1912. Most of this expansion was financed through the issue of debenture stocks, a method which raised finance but left control in the hands of the original small family business (Green, 1985). After the war, expansion was also financed by cross share holdings, particularly with Lord Pirrie of Harland & Wolff ship-builders. Together, the two exercised unchallenged influence over the finance, strategy and organization of the group. The company was quick to invest in the most advanced technologies, including the motor ship. During the war, the group had made healthy profits with which it continued to expand. Expansion did not stop during the slump that followed, and more external finance was raised through loans by which the Group came to encompass 140 companies (not all of them in shipping) by 1926 (Hope, 1990). By 1928, the group was highly in debt and now relied on a period of rapid growth but this slump lasted longer than previous downturns. The company collapsed in 1930. By this time the fleet comprised nearly 15% of total British shipping. Its decline sent a powerful message to other owners not to use external finance.

These norms were born from a historical process of learning that determined business behavior as the century progressed. They contrasted strongly with the innovative financial techniques introduced by foreign entrepreneurs like Daniel Ludwig of the United States and the Greeks Aristotle Onassis and Niarchos. These entrepreneurs financed rapid expansion

through external loans using long term charter contracts signed with the oil companies to guarantee the cash flow to meet loan repayments (Strange, 1992).

Another financial consideration which affected decisions was comparative profit. In the early days, the tanker market offered lower profit margins than the British were used to so, they did not consider switching. This left a window of opportunity open for a new competitor to gain an entrance into the industry.

Finally, we must also consider the number of distractions, uncertainties and red herrings that abounded throughout this period of change. A number of factors could have blurred British businessmen from seeing the need to upgrade. During world war one, British ship owners earned high profits as the government paid handsome rates for the use of their ships. In such circumstances, high profits could be earned without a technical upgrade. Immediately after the war, there were shortages of shipping (Burton, 1994), before the depression reversed conditions and made new investment an unattractive option. Then world war two arrived, followed by a post-war shortage of shipping and very high profit rates which once again seemed to endorse the correctness of the policies (Sturmey, 1962). Full realization of Britain's relative decline was also obscured by an expansion in world trade which provided some growth and stability in overall tonnage. It hid the fact that faster paths to growth were being developed by other nations who were increasing their market share.

Uncertainty made efficient decision making difficult. For example, in the inflationary period following world war two, there was an expectation that, after the original burst of activity, a slump would occur as happened after world war one. The effect of this uncertainty on decision making is illustrated by Sir John Denholm of J&J Denholm who explains:

When the second war was over, my brother and I decided we had either to get out, or go right for it. We'd have done nicely if we sold out then, but we made the decision, and we went

ahead while other firms waited for the slump that never came... It seemed unfair to inflict the whole gamble on our share holders.... by 1951 we had seven ships, all of them built or bought at prices we could never have hoped for if we had waited to see what would happen (quoted in Hope 1990, p.399).

J&J Denholm expanded but many other tramp owners held off waiting for the expected slump in shipbuilding prices only to witness 16 years of rising prices.

4. External forces acting on competitive advantage

This section considers Davie's suggestion that the decline was a reflection of the health of the British economy and its international trade. The health of the economy was important to the extent that it created a demand for shipping, provided cargoes to fill hulls and low cost inputs which helped attain competitiveness. Davies does not go into detail of his explanation and an extensive literature exists on Britain's economic decline in the twentieth century. While not denying Sturmeys explanation of decline, this section suggests that many internal features of decline were extensions of the broader of the economic system. This section identifies some of the broader issues before narrowing in on the coal and shipbuilding industry which were important supporting industries

At the outset of the First World War, Britain still enjoyed a healthy trade based on those industries that characterized the industrial revolution. Textiles, coal, iron and steel still contributed to two-thirds of British export earnings (Harley and McCloskey, 1981, p.64). This over-commitment to old industries left Britain vulnerable to changes in the international economy, in particular rising protectionism which shielded a process of imitation in a number of countries which were once markets for British goods. However, Germany and the United States were not prepared to just imitate, and developed a new range of products and production technologies. With new products and production techniques, these nations

enjoyed an increasing share of world industry while Britain's share declined from 31.8% in 1870 to 9.1% in 1936 (Hilgerdt,1945).

Although British industry was strongly committed to the old industries, it was not stagnant. New industries were rising in importance in both foreign exchange and national income figures (Harley and McCloskey, 1981). However, the transition was occurring at a dramatically slower rate than that in the new industrial power houses. Technology and commerce was now changing at a faster rate than the British had ever experienced. To get a foothold in the new opportunities they needed to respond at faster rate than they were used to. However, American first movers established themselves so quickly in the British market that local firms barely had a chance (Chandler, 1990). Consistent with porter's explanation, adoption of new technologies in some instances was hindered by factor conditions. Britain lacked a Niagara Falls or rivers flowing from Alps that allowed Germans and Americans to exploit electro-chemicals and production of non-ferrous metals such as aluminum (Chandler, 1990). Demand conditions were also important, but it was not so much the sophistication of demand but the size of it. The adoption of mass production technologies was hindered by the small size of Britain's market compared to the United States (Alford, 1981).

Place Table.1 about here

Porter's focus on structure is warranted but his analysis is limited. Adoption of foreign industrial techniques was strongly inhibited by the structure of Proprietary Capitalism. Many of these rigidities have already been noted in the family dominated shipping lines. Small industrial firms, like tramp shipping companies, could not muster the capital necessary to invest in larger scale production, management and distribution systems that was propelling America to industrial leadership. With less capital and a desire to keep family control, British firms were hesitant to engage in risky investments and new and untried products and processes (Chandler, 1990), a factor we have already seen in tramp shipping. This stood in

contrast to America where large corporations, with their industrial R&D laboratories, their accumulated specific stock of knowledge, their competence in large scale R&D projects, production and distribution and their financial resources had a capacity for advancing technology with which a perfectly competitive model could not compete.

The desire for families to retain control meant they were reluctant to seek funds through increased debt or the share market (Chandler, 1990). Consequently, British firms never made investments that would allow them to benefit from the economies of scale or scope that their counterparts across the North Atlantic were achieving. The only changes were smaller, and within the confines of the old organizational form. If British firms amalgamated in an attempt to obtain economies of scale, they continued to use the same old plants. Economies of scale achieved by the Americans remained elusive in Britain where family management groups became entrenched stakeholders. While managers in the United States were increasingly promoted by ability, British family members inherited the leadership of the family firm, effectively becoming a distributional coalition.

Many writers have documented the existence of harvesting and debilitating culture, which Porter stressed. Across the nation, distributional coalitions developed inside firms. Skilled senior workers created strong unions that presented a barrier to the adoption of automated production. The union position was not helped by management's traditional reliance on the market for labor. Faced with fluctuating hire and fire policies, workers sought a property right position, not in terms of career within a particular firm but, in terms of a right to work with particular types of machines or materials (Lorenz, 1994). As these demarcation lines were drawn, unions organized to reinforce such rights. Demarcation was also a result of a high degree of specialization among the highly skilled workers.

As the position of workers became more uncertain in a declining economy, unions became more defensive, responding with vigor to even minor changes in machinery or materials.

Demarcation divisions make it difficult to co-ordinate labor as efficiently as Japan where workers identified with the company and co-operated with the various machines and materials they used. Demarcation lines also made technological change a long, difficult and costly exercise. Burton (1994) notes that in the shipbuilding industry, when new technologies were introduced, demarcation disputes held up orders leading not only to higher costs but also lost customers. The loss of work made the unions even more defensive and, as the economic pie got smaller, unions became distrustful that employers were increasing their share at the worker's expense.

Insecurity in the workplace bred new problems which undermined competitiveness. Burton (1994) notes that theft and absenteeism became expensive problems in shipyards. Workers were responding to the deteriorating situation with a rationality that said 'make as much out of a job as possible because there might be nothing once the job was over'. Consequently, men stayed away from work at the beginning of the week and caught up on the weekends when they earned overtime rates. As a ship they were working on neared completion, they would deliberately slow down to put off redundancy if nothing else came in.

Perhaps the biggest barrier to adjustment was the deeply embedded culture and institutional base. Education was a prime example. Public schools turned out excellent administrators to maintain stability in Britain's empire, but did little for the ideas of technical advance. These values of honor and public worth were not very different to Japan where they had been turned into an asset. In Japan, there had been a deliberate attempt to promote industry and commerce as honorable careers. Perhaps the biggest difference was that in England, there was little science in the curriculum. Science and working with hands to make money were not values endorsed by a society who increasingly saw industry as an area unworthy of a gentleman (Weiner, 1981).

At university a similar pattern existed. Undergraduates were discouraged from pursuing commercial careers. Oxbridge was the model for other universities, providing an education in political leadership with little introduction to the industrial world. While America and Germany were developing new science based education, English talent would not be given the skills to generate technological advance. An interesting illustration of the outlook of academia occurred at the turn of the century when a donor offered 100,000 pounds to establish a school of naval architecture at Cambridge. He eventually withdrew his offer in disgust after learning students would have to qualify in Greek (Pollard and Robertson, 1979). The inevitable result for industry was a woeful shortage of skilled, scientific staff. While Japanese shipbuilders benefited from a flood of graduates in marine sciences, Britain's academic institutions produced little of similar skills. This resulted in reduced R&D expenditure and commitment with serious implications for technological advance in shipping.

Ship-building was arguably the most important supporting industry in the shipping cluster. Here, an aversion to science also existed on the shop floor where the practical craftsman held sway. British shipbuilders did not have any faith in the ability of scientists to contribute to shipbuilding 'because scientists did not know how to build ships, and it was felt that only people who had passed through a proper apprenticeship in the yards and shops were likely to know enough of the problems involved in shipbuilding to be able to arrive at satisfactory solutions' (Pollard and Robertson 1979, p.148). While Britain emphasized the values of the 'practical man' and technological levels that had brought them success in the past, other nations developed deeper understanding. An example of the limited scientific approach to shipbuilding can be seen in the development of the turbine by Parsons (Burton, 1994). Development on the turbine proceeded on a pragmatic way with no attempt to understand for example, the fundamental physics and mathematics of blade design. There was little appreciation of basic science and systematic analysis and new development was left to other countries. As late as 1958, R&D in shipbuilding was running at one per cent of net turnover (ibid).

The fact that innovations still came fairly regularly from the British Isles suggests that British industries had not entered what Klein (1977) calls 'slow history' as the rate of innovation decreases. Even the Liberty ship which propelled American shipping forward was based on a British design, but it was America which revolutionized their production with mass-production techniques. The difference is clearly not the rate of innovations per se, but the rate of their diffusion, and other nations were developing and diffusing innovations quicker.

There was also a failure to develop more sophisticated marketing practices. Companies lacked clear market strategies. Even the most successful selling and advertising practitioners had little or no understanding of the basic concepts of marketing. As Alford (1981, p.328) states 'advertising was regarded as a means of popularizing what was produced, not as a means of exploiting what had been discovered about consumer tastes and wants'. Burton (1994) suggests that the failure in marketing and selling by ship-builders, grew out of a long history of customers beating a path to the British door. While others were doing their utmost to satisfy customer need, British builders declared themselves the best in the world, failing to notice the changes around them.

Weiner (1981) believes the nation had experienced a move from technology and commerce, a reflection of a "gentrification" of the leaders in the economy. On success, business men bought land and retired to the country to enjoy it. As a consequence, the countries most able men became divorced from the world of commerce and industry. Company directors became aloof from management, their board rooms exhibiting a gentleman's club atmosphere which nourished cautious policies. This process, noted in the last section as having occurred in shipping, was clearly a broader systemic issue. The result was a conservative managerial culture which braked growth, placed stability ahead of growth and resisted institutional overhauls.

Success had provided the English with a healthy sense of self belief and inbred a sense of moral superiority which created a barrier to adapting foreign production techniques (Weiner 1981). Americans were seen as being obsessed with size, speed, mechanization and money. Gentleman-industrialists, like Peter Menzies of ICI, put down American materialism saying it would be wrong to 'take up the American patter' (quoted in Weiner 1981:142). The UK economic system had produced its own aesthetics and this extended down to the workplace. American success was contrasted to the English founded on values of humanity, honor and craftsmanship. Even leading engineering magazines objected to American ideas of scientific management with the comment that 'there are fair ways and unfair ways of diminishing labor costs...' (quoted in Weiner, 1981, p.143). Wayne Harkin of Texas observed this pride when he inspected British shipyards:

I found among these men a real pride in their accomplishments and indeed they have a right to be proud. Skilled craftsmen are in evidence all over the place. What amazed me was the fact that they had been able to turn out the quality of work with the facilities (quoted in Burton 1996, p.236).

The desire to avoid social disharmony and conflict was a very real issue and added a cost to change that Americans did not have to face. Britain possessed highly skilled specialized workers who would have suffered very real dislocation from the change to an unskilled mechanized industry. Both employers and employees showed some preference to try to squeeze more out of the existing technologies, with the inevitable reduction of incomes and in some cases, loss of quality (Lazonick, 1991).

Sturmey(1962) describes how local ships continued to be bought even though better and cheaper ships could have been obtained from overseas (Sturmey, 1962). For example, the knowledge that tankers could be built more cheaply on the continent during the 1930s did not lead to buying abroad. It was just another reason for not having tankers at all. However, he

does not believe this is a cause of decline because ships could still be bought off-shore, but Sturmev wrote before the inertial nature of supplier relationships was understood. However, the importance of linkages to weak shipbuilding industry should not be overstated. As Robertson (1988) notes it was not the builder who determined the specifications of the ship. The builder might make suggestions however, the buyer had their own technical representatives who would over-see construction and fitting out. In the early days, the close technical relationship between builder and ship owner had increased the flow of information and led to increased efficiency. However, close relationships can become a weakness if one partner becomes inefficient and weighs the other down or alternatively, if communication is based around old patterns and norms and does not change with the times. As Lundvall (1992) notes investment of time, information and trust in such relationships can lead to rigidities that restrict more flexible change. It was a particularly harmful linkage given the integrated nature of the industry in Britain. Many shipbuilders and shipping companies had close associated companies. Ship-owners often bought British ships out of goodwill to their fellow countrymen, an expensive gesture for some. For example, in the 1960s, P&O continued to give orders to Fairfield shipbuilders even though Japanese could provide the ships much more cheaply. When Fairfields collapsed in 1965, P&O suffered as an unsecured creditor. As Sir Donald Anderson stated ‘our gesture of goodwill towards British shipbuilding turned out to be very expensive for us, and of no help to the shipbuilding industry’ (quoted in Howarth and Howarth, 1986, p.171).

The cargo whose decline most hurt shipping was coal. Between 1913 and 1938, British coal exports halved from 77 million tons to 38 million, and further still to 7 million in 1960 (Hope, 1990, pp.368, 399). British shipping had derived a marked competitive advantage from the fact that it had an outward cargo with a vast global demand (Davies, 1985; Sturmev, 1962). Coal exports declined with the rise of oil, an increase in foreign output of coal, and more efficient use of coal which reduced its use. The decline of coal was particularly damaging to Britain’s tramp shipping which was well adapted to the coal trade.

The reliance on coal as a supporting industry and the limitations of family firms in the tramp trades are well illustrated by the Cardiff based 'British Steamship Company'. Cardiff at the turn of the century was the largest coal exporting port in the world (Middlemiss, 1989) and had a large tramp fleet going to the Mediterranean, the Black Sea, and Latin America where the return cargo was grain. The British Steamship Company was one of a number of companies founded by John Cory a master of coastal traders (Middlemiss, 1989). In 1854, he started his own business drawing on close association with Cory Brothers, coal exporters of Cardiff, and William Cory and Sons who operated colliers. In 1874, John Cory bought his first steamships and his fleet grew rapidly to number 19 in 1884. As befitting an age of proprietary capitalism, his sons were brought in as partners in 1885, the eldest taking over the business when his father died. By 1891, the company had become the largest importers of iron ore in South Wales. By the outbreak of the First World War, the company had 23 tramps and a world wide market for its unique blend of coal. The decline began in World War One with war-time losses halving the size of the fleet. However, worse was yet to come with the decline in coal exports. Cardiff shipping suffered greatly and in 1923, more than half of the city's tramp-owners crashed. By the Second World War, the company had only three tramps, only to lose all of them in the hostilities. With experience being their only remaining asset, they survived by chartering ships and making the occasional purchase, including the company's only motor ship in 1959. However, ships were getting bigger and more expensive. The family firm could not afford to build an expensive bulk carrier which meant they could no longer be competitive in the tramp trades. By 1989, they were no longer a shipping company but operate as shipping agents under the name Raymond Cory. They were a well managed company that reflected the fleet's dependence on the external environment.

5. Discussion

Britain's market share in shipping which stood at 50% in 1890 had fallen to 16% in 1960 (Sturmeay, 1962, p.4). Although tonnage had climbed slightly, it had failed to seize the

growth options available. The sources of competitive advantage had restrictions on it from both inside and outside the industry. Many of the features identified were features of the broader economic system and are compatible with Porter's analysis. However, this paper also reveals some limitations of Porter's work.

Porter's description of British decline in the twentieth century identified several causes. Among factor conditions, the British educational system lagged behind others with a weak commitment to technology and R&D. Demand conditions had deteriorated as a result of falling living standards. Consumers focus was not on quality and innovation, but price. Form strategy, structure and rivalry was characterized by a management culture that works against innovation and change, a debilitating relationship between management and labor, and a tendency against competitive behavior and a preference for harvesting. In summary Porter(1990:506) states "Britain declined because of growing disadvantage in each part of its diamond. Most significant in my judgment have been weaknesses in human resources, low motivation, the lack of rivalry, and eroding demand conditions."

An interesting feature is the way that past strengths had become weaknesses in the evolving market. Britain's success was achieved on the back of coal, iron and steam technologies. With these, British family firms had developed skills, capabilities and heuristics that brought them success. They reinvested profits and gained a technological edge with which others could not compete. Marshallian industrial districts grew whose products provided key cargoes and capital goods for the shipping industry. Success showed that British techniques were the best, and they were. However, when superior techniques arrived British shipping and industry were entrapped by an arrogance, institutional and belief system which slowed down the pace of change. Britain was suffering from an over commitment to the products, organizational forms and production technologies it had developed in the industrial revolution. British ship owners neglected the opportunities associated with the tanker, the diesel powered motor ship, and the importance of speed as a competitive factor. When other

nations arrived with new techniques they were perceived as cheating. It reflected a pre-occupation of old techniques and a lack of self criticism.

The macro-nature of Porter's analysis was such that he could not say much on related and supporting industries. However, he recognizes the two-way mutual reinforcement of industries. Porter identifies a gradual un-winding of clusters but this is inadequate description of what happened in the shipping industry. Inter-industry relationships stayed strong, and buttressed the old ways of thinking. As figure.2 shows the heuristics of decision making were retained, but each heuristic proved insufficient in the new age. This persistence of heuristics can be re-cast in light of Schoenberger's research. Schoenberger (1997) showed that the time-space dimension of commerce was being compressed. For British shippers, this meant that technology and commerce was changing at a faster rate than they had ever experienced. The heuristics that had been so wise twenty years earlier rapidly became obsolete, but were reinforced by logic, learning and colleagues in reinforcing industries. In this way, the communication channels with supporting industries became chains rather than props.

Place Figure.2 about here

It is the emphasis on rivalry in which Porter is found most wanting. In the shipping industry, the highly competitive tramp sector was routed, while the liners who operated in the gentlemanly non-competitive nature survived and prospered. Liners showed a greater ability to survive than the perfectly contestable tramps, a reflection that a large number of highly competitive operators had trouble adapting to change that required greater co-operation and high levels of finance. It also recognizes that profit maximization is an insufficient explanation of business motives. Autonomy, family pride and the desire to adhere to firmly-held values are equally important when understanding commercial behavior.

Other studies have also found a poor linkage between performance and rivalry. In a study of the automobile industry which was generally supportive of Porter's model, Sledge (2005) found that high levels of domestic rivalry do not necessarily make firms more competitive. Similarly, Espana (2004) found that a national champion in Brazilian aeronautics prospered without domestic competition. While the effect of competition on innovation is well documented (see for example Clydesdale 2006), Porter might be over-stating the case. As Moon, Rugman, and Verbeke's (1998) model suggests international competition can also play a role, but innovation also relies on resources beyond the small competitor.

In the innovation stage, Government action, in particular postal subsidies played a very important role in diffusing innovation and establishing steam-lines where, if left to the market, they would not exist. This is consistent with Espanan (2004) who found government assistance was pivotal in the development of capabilities in Brazilian aerospace. The role of government in the innovation and infrastructural stage is clearly greater than the partial role Porter gives it, while rivalry which Porter gives prime importance, was found to be partial in both cases.

Shipping's supporting industries had succumbed to inertial forces. Domestic factors of production, in particular coal, which previously provided a competitive advantage failed to do so in the age of diesel. Demand in Britain did not grow as strongly as other regions. Many of the inertial forces impacting on the industry were an economy wide process. These include the persistence of organizational forms and the distance that now existed between managers and core industrial activities. Families appeared as distributional coalitions increasingly distanced from productive activities. Across the country, sources of competitive advantage in the earlier age had become sources of entrapment.

An alternative view to the one presented in this paper is one in which the British position did not decline as such, but moved from low wage sectors of the industry to high waged ones

such as finance and marine insurance. This view is one which recognizes a globalized division of labor in the industry. A ship-owner can obtain finance in London, build the ship in Korea, install American navigation equipment, hire a crew from the Philippines and register the ship in Liberia or Greece. The ship might then be put on service between the Middle East and Japan. But this ignores for example how Japan continued to innovate and maintain its position despite being a high wage economy.

This view suggests that national economies will be less important in shaping the path of industrial growth in the future. While globalization will lead to greater flexibility, it would be foolish to over-state the effect. Consider the example of Norway, a shipping nation that appears to excel on routes that go nowhere near its home base. Consequently, we would think its domestic environment is irrelevant. However, Norwegian shipping draws strongly on its home-based industrial cluster which includes 20% of the world's ship insurance market, 15% of the world's fleet classification, ship-gear producers, educational facilities and brokerage houses. The domestic economic system still appears to be playing a large role, albeit at a reduced level than that in the nineteenth century. The home economy is still very important in helping a nation gain the initial capabilities to succeed. The domestic market is where the infant industry learns to walk and is frequently an off-shoot of other industries, consumer demand, military demand and a myriad of other factors that might or might not exist in the local environment. Finally, we must consider the way the local environment and business community buttresses the outlook of strategic decision makers.

Figure.1 British steamship competitive advantage and heuristics

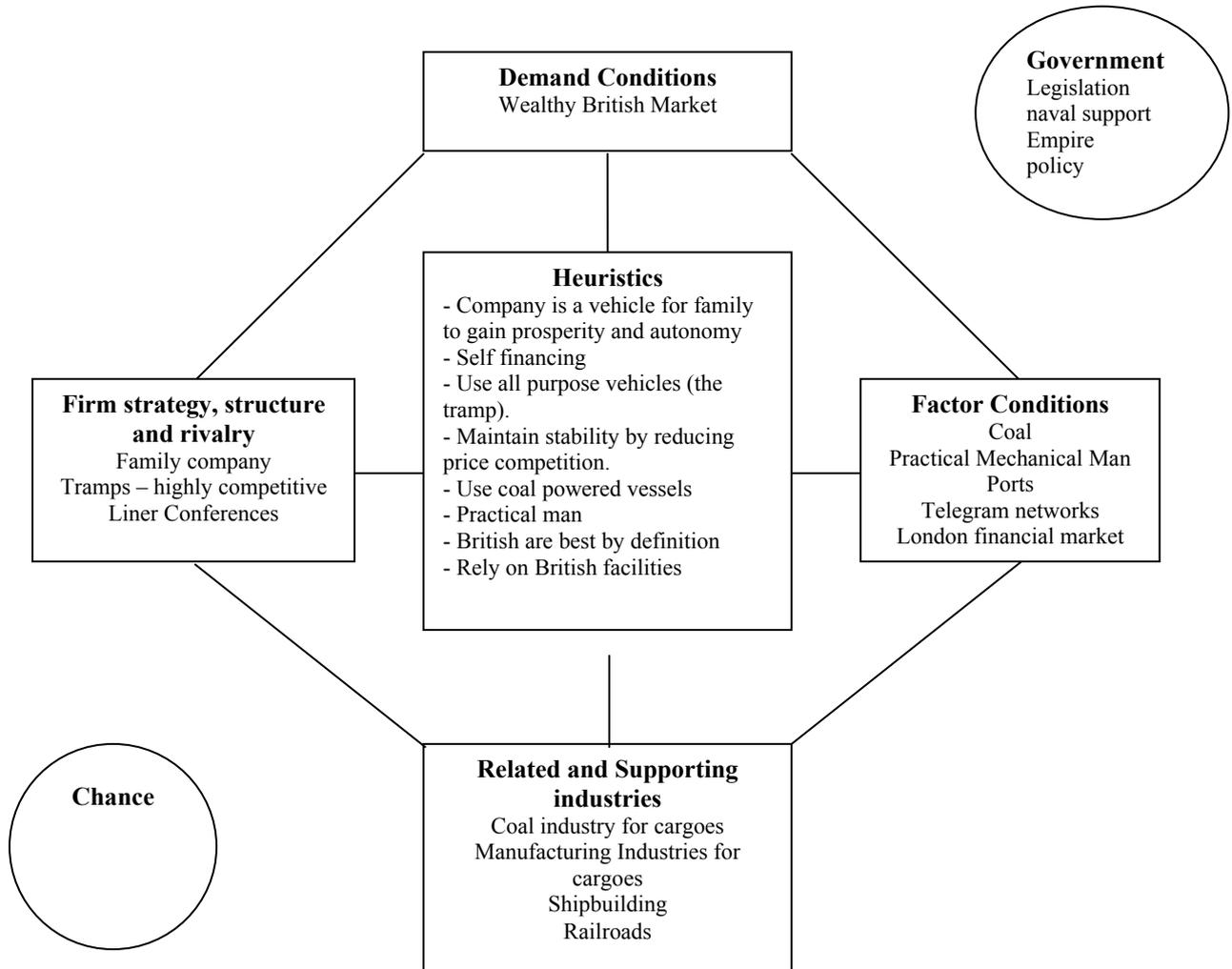
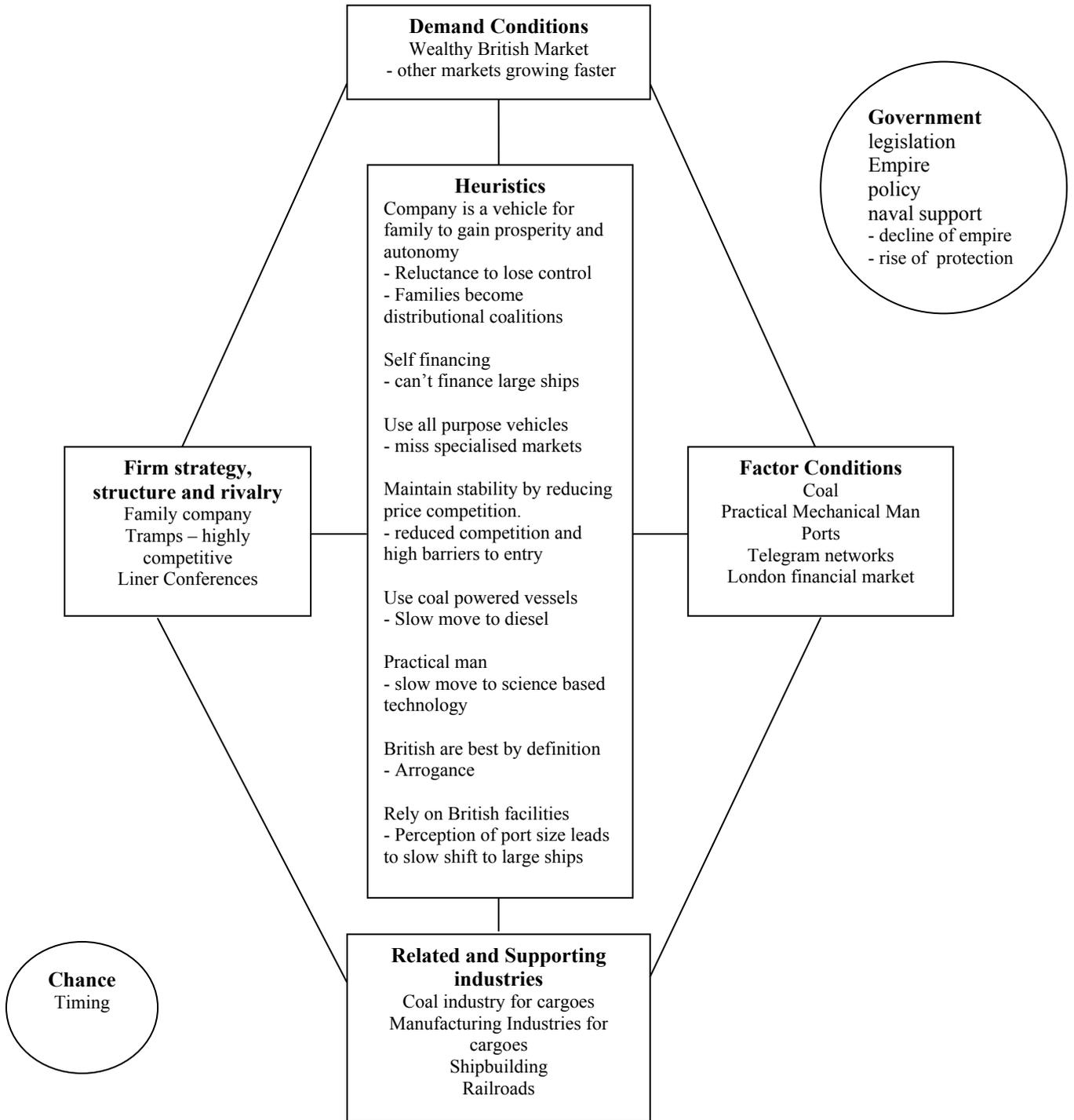


Figure.2 **Buttressed heuristics lead to rigidity**



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