Dominique Barjot et Patrick Fridenson (dir.)

France-Japon, regards croisés
France and Japan, a cross-analysis

Mélanges en l'honneur de Terushi Hara
In memoriam Terushi Hara

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Grand ami de la France, l'historien japonais Terushi Hara a ouvert d'importants chantiers scientifiques. Spécialiste de l'étude des ententes, des cartels et des politiques industrielles durant le XX^e siècle, une grande partie de son œuvre a été consacrée à l'histoire des chemins de fer, d'abord celle des chemins de fer algériens, mais aussi celles, comparées, du Shinkansen japonais et du TGV français. Partant des progrès de l'organisation scientifique du travail, intégrant les problématiques de l'américanisation, Terushi Hara s'est intéressé à la question des transferts de technologie et organisationnels. Son expertise de l'économie française, qu'il a fait connaître aux étudiants japonais, l'a imposé comme un grand historien des entreprises et des processus d'intégration internationaux, notamment de la stratégie des entreprises japonaises en France et en Europe.

Des historiens japonais et français, un historien suisse, un historien canadien et une économiste française offrent dans ce livre leurs contributions sur les thèmes qui ont été les siens, rendant possibles des regards croisés entre France et Japon à l'heure de la mondialisation.

Dominique Barjot est professeur d'histoire économique contemporaine à l'université Paris-Sorbonne (Paris IV) et directeur adjoint de l'UMR 8596 Centre Roland Mousnier. Il a été professeur invité à l'université de Tokyo.

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Terushi Hara (1943-2011) a fait ses études universitaires à Waseda, université privée la plus prestigieuse du Japon, puis en France avant de soutenir au Japon une thèse de doctorat remarquée. Proche de François Caron, il a été professeur d'histoire économique occidentale à la School of Commerce de l'université Waseda. Il est devenu le spécialiste de l'histoire industrielle et des politiques économiques de la France. À l'origine d'importants programmes internationaux (cartels et missions de productivité), il demeure l'un des meilleurs connaisseurs de l'histoire ferroviaire française et japonaise.

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DEUXIÈME PARTIE

Terushi Hara, historien des transports

HIGH SPEED RAILWAY FROM HISTORICAL COMPARISON: BRITAIN, FRANCE AND JAPAN[1]

Takeshi Yuzawa

On 1 October 1964, Shinkansen was launched between Tokyo and Osaka in Japan with the speed of 210km/h. This date marks the beginning of the modern High Speed Railway (HSR) era and in 2014, Shinkansen celebrated its 50th anniversary. Japan is currently acknowledged as the world leader in railway technology and operation. Furthermore, the obvious advantages of the Shinkansen in both speed and capacity have stimulated the construction of dedicated high-speed lines in many other countries.[2]

The late Professor Terushi Hara published a paper entitled "Les échanges franco-japonais de technologie ferroviaire dans l'après-guerre" in a volume of Festchrift in 1998 and an English version appeared in the *Japan Railway & Transport Review,* no. 27, 2001, as "Reflections on Postwar Technical Exchanges between Japanese and French Railways." Referring to the exchanges of top engineers between Japan and France in 1950s, he stressed that the Shinkansen borrowed the French technology of the AC electrical driving system, and clarified how Japan National Railway (JNR) made French technology its own and incorporated it into Shinkansen. Japan and France were striving for modernization of the railways after World War II, and engineers in both countries exchanged information. JNR learned AC electrification from Société Nationale des Chemins de fer Français (SNCF), and as the result Shinkansen could emerge as a first HSR in the world, as an example of "the mutual respect and competitive spirit between French and Japanese railway engineers that drove the development of high-speed railways in both nations."[3] France started

1 This paper is based on an important bibliography. We can quote for example: Aoki Eiichi, *Tetsudo no Chirigaku* [*Geography of Railways*], Tokyo, Wave Shuppan, 2008; Kitagawa Daijiro, "Visual Aspects of Urban Railways in Paris and Tokyo during the Early Railway Period," *Japan Railway & Transport Review*, no. 23, 2000; Jacob Meunier, *On the Fast Track: French Railway Modernization and the Origins of the TGV, 1944-1983*, Westport (Connecticut), Praeger, 2002; Noda Masaho, Harada Katsumasa, Aoki Eiichi and Oikawa Yoshinobu, *Nihon no Tetsudo* [*Japanese Railway*], Tokyo, Nihonkeizai Hyoronsha, 1986; Charles Stuart-Williams and Ernest Short, *Railways, Roads and the Public*, London, Eyre and Spottiswoode, 1939.

2 Roderick A. Smith, "The Japanese Shinkansen: Catalyst for the renaissance of rail," *The Journal of Transport History*, vol. 24, no. 2, September 2003, p. 235.

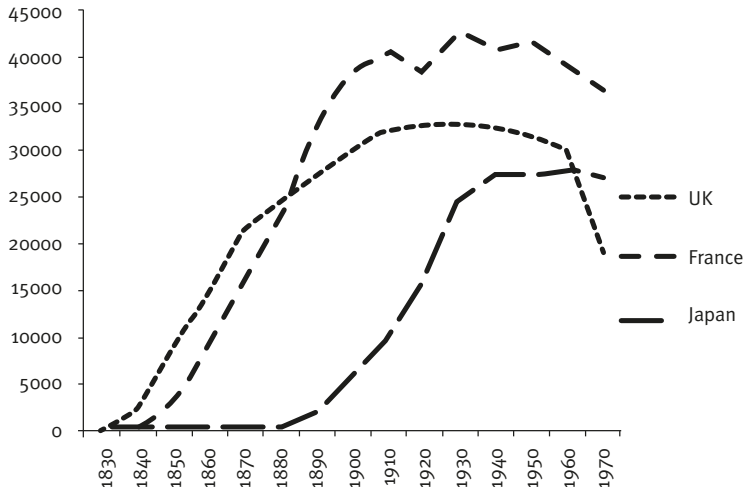
3 Terushi Hara, "Reflections on Postwar Technical Exchanges between Japanese and French Railways," *Japan Railway & Transport Review*, no. 27, 2001, p. 39.

TGV (Train à Grande Vitesse) at a speed of 260km/h, in 1981 between Paris and Lyon. Now it extends its network to other countries on the Continent and to Britain though the Channel Tunnel. Japan and France are currently top runners, as well as each other's competitors, in the world HSR market.

Many have wondered why Britain, initiator of the railway, did not have a leadership role in the Renaissance of the declining railway industry after the World War II. Though Britain introduced Intercity 125 with a diesel engine on the existing infrastructure in Britain is now behind the top group in development of HSR.[4] The British attitude toward HSR will be explained by various factors, but I would like to elaborate on reasons from historical backgrounds, specifically the relation between state and railway.[5]

Firstly, it will be useful to understand the general tendency of the length of railways, and then the current situation of railways in the passenger traffic on the land. The following chart compares the trend of railway lines (km) in UK, France and Japan, and shows that Japan is the last to develop the railway network among the three countries. UK declined rapidly in the 1950s and 60s, when Japan started to construct Shinkansen. France declined after 1950, but not so radically as did Britain. Japan also fought against the severe competition from car and air, but as the chart shows, the railway largely maintained its position.

Table 1. Compared trends of railway lines (km) in UK, France and Japan 1830-1975



Source: Brian R. Mitchell, *European Historical Statistics, 1750-1970*, London, MacMillan, 1975

4 Moshe Givoni, "Development and Impact of the Modern High-speed Train: A Review," *Transport Reviews*, vol. 26, no. 5, 2006, p. 593-594.

5 Mizutani Fumitoshi and Nakamura Kiyoshi, "The Japanese Experience with Railway Restructuring," *Governance, Regulation, and Privatization in the Asia-Pacific Region. NBER East Asia Seminar on Economics*, vol. 12, 2004, p. 313-316, http://www.nber.org/chapters/c10195.

The **table 2** explains the modal split of passenger transport of land in 2010 in three countries. Though Japan has the largest car production in three countries, the share of passenger transport by cars is 62.5 %, the lowest, comparing with 85.4 % of UK and 84.0 % of France. The percentage of passengers carried by railway in Japan is more than twice that of the UK and France, and the share of the metro and trams in Japan, which includes private urban railways, is also enormous compared to those of the UK and France.

Table 2. Modal split of passenger transport of Land 2010-UK, France and Japan (pkm.%)

	UK	France	Japan*
Cars	85.4	84	62.5
Buses & Coach	5.9	5.3	6.8
Railway	7.4	9.2	19**
Metro & Tram	1.4	1.6	11.6***

Source: *EU Transport in figures Statistical Pocketbook*, 2012, Ministry of LIT, White paper 2012.
* Data is taken on 2009, because the method of statistics changed in 2010.
** JR and HSR (Shinkansen).
*** Urban private railways. Metro and Tram are excluded. In Japan there are 17 lines, in which 13 lines (540 km) are run by municipalities for 540 km and 4 lines (214 km) by PPP.

CHARACTERISTICS OF RAILWAY INDUSTRY AS A PUBLIC TRANSPORT

The railway has several characteristics as public utility, which set it apart from other private business such as the iron or cotton industries. Even though *laissez-faire* capitalism was in full swing, British government and parliament were involved in railway policies, including those of safety, fare or rate, and service.[6]

The first important characteristic of the railway industry is its nature as a monopoly. It is largely for this reason that the government intervenes in the fares and rates system, and the limit of dividend of the companies. James Morrison, MP of House of Commons, spoke on railway regulation in 1836, saying, "Competition was almost impossible for several reasons; the existing company probably was already in possession of the best line; if in spite of everything a rival line were established, the two companies would be sure to make an agreement which would close the competition between them."[7]

Secondly, the railway needs tremendous capital to buy the lands and to provide locomotives, carriages and other facilities. Promoters organize a joint stock company to raise money, and could afford to collect money from the wealthy

6 C. E. R. Sherrington, *The Economics of Rail Transport in Great Britain*, New York/London, Longmans, Green & Co./E. Arnold & Co, 1928, vol. 1, p. 230-231.

7 Henry Parris, *Government and the Railways in Nineteenth-Century Britain*, London, Routledge/Kegan Paul, 1965, p. 22, cited from *Hansard*, XXXIII, 1836, p. 977-988.

investors, but in other countries it was usually difficult to raise money without governmental support or foreign investors. Excluding Britain, government would typically be involved in railway projects through various methods such as direct subsidies, guaranteed interest, and land grants. When underdeveloped countries planned railways, they often had to rely on foreign investors, who asked to guarantee a certain degree of dividend or interest rates by the national or local governments.

Thirdly, railway is one of the network industries. In general, one railway is required to connect with others to provide convenience to passengers and carriers. When railway companies started to serve through traffic, they had a conference to standardize their facilities and operations under the common rules and regulations. In Britain, a Royal Commission was appointed to decide on the question of the uniformity of gauge, and in 1846 the Gauge of Railways Act was passed, making 4 feet 8½ inch the standard gauge size in Britain, and later in the world. As railway is a network industry, government or other organization must take the lead for the standardization of facilities, rules and regulations common to the railway companies. They have a tendency toward mergers or amalgamations, which furthers the economic monopoly and the natural monopoly of railway.

Owing to these characteristics of railways, the government, even at the time of *laissez-faire*, intervened in various aspects of the railway industry. The relation between government and railways, however, has been different according to the nation and to stages of railway development, and it will offer the key to understanding the attitudes towards HSR in Britain, France and Japan after World War II.

RAILWAYS AND GOVERNMENT IN BRITAIN

Railway policy at the high time of *laissez-faire*

Non-intervention of government had been articulated fundamentally in the nineteenth century of Britain from the very first days of railway industry. This logic was part of the foundation of *laissez-faire*: the nation's interest will be served by individuals pursing their own interest free from government interference. Public opinion would cause railways to pursue strategies that benefited the nation, because railways that failed to do so would fail themselves.[8]

8 Frank Dobbin, *Forging Industrial Policy: The United States, Britain, and France in the Railway Ages*, Cambridge, Cambridge University Press, 1994, p. 179, 191.

Throughout the 1830s, the government was neither anxious to regulate railways nor convinced of the advantage of *laissez faire* in railway matters.[9] The government considered securing a social benefit for the public an obligation, and one that the railways were equipped to supply. The first measure taken by the British government to achieve this was the Act of 1838, which obliged railways to provide the Post Office with this service. Following that, the Act of 1840 required the railway companies to send annual returns of their traffic and of accidents occurring on their lines to the Board of Trade.

The only technical and managerial problem the British saw that demanded public attention had to do with safety. They were intensely concerned about the capacity of large railways to place passengers and employees in physical danger. The reason for this concern may be traced back to Britain's nobles oblige tradition, and to the tradition of protecting individualism by guarding citizens against stronger private parties.[10] Britain's initial policy strategy was to allow public opinion to take care of safety matters, with the logic that the interests of the railways and the public coincided.[11] The railway policy of the safety is important not only for the public but also for the railway company, because once an accident occurs, the company must stop the operation of business and will endure serious damage. Preventing accidents is essential both to the public and to the railway company. In the accident on Christmas Eve of 1841, eight third-class passengers travelling in a low-sided open carriage were killed. Following this incident, the Regulation of Railways Act in 1842 was passed, and was the first to refer specifically to safety of passenger travel by rail. The government began to mandate the use of the legally arranged safety devices by the railways.[12]

Gladstone, then President of the Board of Trade, passed the Railway Act of 1844, which was comprised of two sections. The first section proposed the nationalization of railways in the future, which was severely attacked by the railway interests headed by George Hudson, called railway king at that time. Eventually the original Bill was modified so that the existing railway companies would be exempted from its application. The original idea of the nationalization for all railways was taken the teeth out of the Bill, and the interests of existing railways were preserved without any effect of the Act even after a period of twenty-one years.

The second section of the Act compelled the railway companies, "for the Benefit of the Public," to put their third-class passengers in enclosed vehicles

9 Henry Parris, *Government and the Railways in Nineteenth-Century Britain*, *op. cit.*, p. 26.
10 Frank Dobbin, *Forging Industrial Policy*, *op. cit.*, p. 195.
11 *Ibid.*, p. 179.
12 C. E. R. Sherrington, *The Economics of Rail Transport in Great Britain*, *op. cit.*, vol. 1, p. 228.

provided with seats. At the same time, companies were ordered to run a third class train at least once a day in both directions, and its fare should not exceed 1 penny per mile. Having met those requirements, any railway was exempted from the payment of passenger tax on these fares. The railway companies were persuaded, and finally accepted the Act. These trains were called parliamentary trains.

Government intervention from 1868

For more than two decades, government could not significantly increase its power over the railway companies, but from the latter half of 1860s, the government was condemned for its weakness of railway control. After the speculation mania which ended in 1867, the companies were in financial distress, and powers were losing in the politics and government. The Regulation of Railway Act of 1868 increased the power of government to supervise the railway industry thorough accurate tabulated accounts and statistics which were to be presented at half-yearly intervals.[13] As the power of the parties grew, the railway interest groups in parliament saw a decline. The MPs became more conscious of their constituencies, and therefore interested in lower railway charges. As such, 1868 was one of the turning points for the relation between the state and railways. The Royal Commission on Railway reported that the greater state intervention had resumed.[14]

The Royal Commission on Railway started to curtail the companies' freedom to run their business, and stiffened the rules regarding the preparation of their accounts. Parliament began to look further into complaints of abused monopolies, and rising protests made by commercial firms against the rates that railway charged for them.

By the end of the nineteenth century, this tension between government and railways had been resolved in an industrial policy paradigm that provided protection for passengers and carriers. The state had a duty to guard the weak economic actors that comprised the economy, just as it had a duty to guard the weak political actors that comprised the polity. Toward the end of 19th century, state intervention in the railway sphere went further in three main directions; (a) additional measures for the safety of the travelling public, (b) regulation of charges, and (c) settlement of labour disputes.[15]

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13 *Ibid.*, p. 237.

14 Henry Parris, *Government and the Railways in Nineteenth-Century Britain*, *op. cit.*, p. 214.

15 *Ibid.*, p. 215-216; James S. Foreman-Peck, "Natural Monopoly and Railway Policy in the Nineteenth Century," *Oxford Economic Papers*, vol. 39, no. 4, 1987, p. 105, 120-121, 105; Frank Dobbin, *Forging Industrial Policy*, *op. cit.*, p. 165.

During World War I, the railway network was under the control of the government. Through this method, troops and war supplies were smoothly mobilized, and after the war, the benefits that arose from central control of the railways were widely appreciated. In addition, the railways were threatened by a new kind of competition from electric trams and cars. The railway was conceived as an old and tired industry faced with rising costs and declining performance. In 1921, the Railway Act was passed, and 120 companies were amalgamated into four large companies by 1923. They were at first aimed at nationalization of the industry, but were preserved as privately owned corporations.

After World War II, the Labour government took power and passed the Act of 1947, which stipulated the nationalization of railways, inland waterways and much of the road transport industries under the British Transport Commission (BTC). The BTC created Executives to manage different divisions, and Railway Executive was one of them. However, the relationship between BTC and the Railway Executive "was never easy and sometimes badly strained."[16] Moreover, the Labour and the Conservative parties both came into power through general elections, and the governmental railway policy swung accordingly from one extreme to the other. One of the remarkable policies was the Beeching Plan in 1960s, which suggested the closure of 30% of routes miles and 55% of stations. Within five years of the publication of the first Report in 1962, about 3,000 miles were destroyed and 250 services withdrawn on strict economic grounds. Though Beeching's second Report proposed substantial investment in modernization of the trunk route, this did not prove successful, due to the numerous feeders for the trunk lines being cut off, and the public's increasing reliance on cars. Appreciation of the Beeching plan might be disputable. Charles Loft attempted to renew the favourable public opinion of Beeching, and to say that its plan would successfully modernize the British railways.[17]

In 1993, the Transport Act moved the railways back to private ownership, and broke up BR into nearly 100 self-standing rail businesses. The fragmentation of the railway system led to a severe loss of organizational knowledge; moreover, it exacerbated the difficulties of coordination in an industry with highly complex interfaces. Ultimately, the blame for public policy problems can be placed on the government, and the governmental failure in

16 Jack Simmons and Gordon Biddle, *British Railway History*, Oxford/New York, Oxford University Press, 1997, p. 367.

17 Charles Loft, *Government, the Railways and the Modernization of Britain: Beeching's Last Trains*, London/New York, Routledge, 2006, p. 158.

the rail sector is evident not only in the flawed model of privatization and rushed reform, but also in the failure to set up a clear system of government regulator–industry relations. The privatization of BR would likely weaken the power and motivation to innovate, and to introduce HSR, as did Japan and France.[18]

Surrogate organizations of the government

Though railway is a network industry, British government has been reluctant to intervene therein. Nonetheless, the railways were operated nationwide, consistently with standardized technologies and common rules and regulations, but without governmental control. There were several organizations in private bodies: the Railway Clearing House (RCH) for the companies and the Institution of Civil Engineers (ICE) and Institution of Mechanical Engineers (IME) for the professionals.

Railway Clearing House (RCH)

The alarm expressed in the newspapers at the growing number of accidents in the winter of 1840-1841 persuaded the leading railway directors that it was necessary to forestall the growing criticisms of railway management. In 1841, directors and leading officers from nineteen companies gathered in Birmingham to draft a set of rules and regulations, "to be observed by enginemen, guards, policemen, and others on all railways." The meeting, which was led by George Carr Glyn, chairman of London and Birmingham Railway and banker in London, agreed unanimously to a resolution, "that there should be a uniform system of regulations and signals recognized as applicable to all railways."

The Railway Clearing House (RCH) was established in 1842 as a voluntary organization for major railway companies to clear the accidents and problems that arose with the through traffic of the member companies. The RCH decided the rules and regulations for the operation and technology of railways, which gradually came into effect with non-member companies, and eventually became national standards.[19]

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18 Ian Bartle, *Britain's Railway Crisis – A Review of the Arguments in Comparative Perspective*, Occasional Paper 20, Centre for the Study of Regulated Industries, University of Bath, 2004, 1, p. 55.

19 Philip Bagwell, *The Railway Clearing House in the British Economy 1842-1922*, London, Allen and Unwin, 1968, p. 36, 39.

Professional Institutions: ICE and IME

The Institution of Civil Engineers (ICE), founded by a small group of civil engineers, was granted a Royal Charter in 1828. This gave it status as leader of the profession, and declared that its "aim was to foster and promote the art and science of civil engineering." In 1894, a new home for the ICE was built in Westminster, heart of London. At the same time, membership levels were increasing by around 5,000 people. The ICE had annual and monthly meetings to exchange update informations and technologies, and published various papers, which included the proceedings. It had also managed education and practical training in this field.

The ICE led the advanced practical technologies in Britain, and was closely tied to parliament and the government. ICE is located near Westminster and Whitehall, and the members of ICE are easily able to attend parliament as witnesses, and use their professional knowledge to advise the governmental office.

The Institution of Mechanical Engineers (IME) also took a stance similar to that of ICE in its support of parliament and government. The Institution was established in Birmingham in 1842, and its first president was George Stephenson, largely known as the father of railway. In 1889, the head office moved to Westminster of London, and IME noted that "All these publications contain key recommendations to government and policy makers." (IME, homepage). Much like ICE, the Institution also managed education and practical training in this field.

The British government was hesitant to intervene in the railway except in certain functions such as safety and rate. Railway companies therefore decided on common rules and regulations for themselves, and maintained their high standard of technologies and service through the use of such bodies as RCH, ICE and IME. These organizations collected and accumulated information on the practice and technologies of railways, and took the role of the government in many ways.

RAILWAYS AND GOVERNMENT IN FRANCE

Characteristics of French railway policy

France had long history of a large and elaborate bureaucracy that regulated many areas of French life. This bureaucracy survived even through and after the revolutionary periods, and played an important role in the French government throughout the nineteenth century. By the time railways began to proliferate, there were already well-established governmental structures and procedures that could easily expand to encompass railway regulations. The French railway

system was therefore, from the start, created under a considerable measure of state control and some state assistance, which was promoted ardently by Saint-Simonists. Due to the political turbulence and strong oppositions, France was behind Britain, Belgium, and Prussia in railways, but hastened their construction under the strong state leadership during the regime of Napoleon III.

Paris was viewed as the capital of Europe, and as such, the railway network was planned so that all the lines would be centered in the metropolis. While this served political and military purposes well, it was not necessarily a benefit for the national economy. For example, the government constructed a long stretch of railway to the east along the German border that proved to be strategically crucial, but which lacked economic viability.

There was another reason why government took the lead in railway construction. Big cities like Marseille and Lyon did not embrace wealthy people who were not eager to invest in the railway projects. Lack of capital for railway required governmental assistance and government made the policy of rewards and pressure to the rail companies to build the needed lines. However, no government was prepared to carry the financial responsibility of a complete state system, though some of the schemes assumed state construction of main lines. It was generally agreed that, without a considerable measure of state control and some state assistance, France could not create a railway system suited to its economic and political needs.

French government intervened in the railway networks in three spheres. Firstly, the state cooperated with companies, carrying a reserved right of ownership by the state. Secondly, the state controlled the geographical plan of the system, and thirdly, the state recognized its right to supervise rates, insisted on safeguards for travelers, and had its representatives in the counsels of the companies.[20]

The relation between state and railway

In 1838, the *Compagnie du chemin de fer de Paris à Orléans* (PO) was founded. With this, the government guaranteed the company's shareholders – on an initial capitalization of 40 millions francs – a three percent interest, plus one percent for amortization, for a period of 40 years, both interest and amortization charges to be payable in case of a deficit by the treasury. The railway opened partly in 1840, and by 1843, stretched 114 km to Orléans, which made it the longest railway in France at that time.

20 John H. Clapham, *The Economic Development of France and Germany, 1815-1914*, 4th ed., Cambridge, Cambridge University Press, 1945, p. 145-146, 150.

This momentous step marked the beginning of an endless stream of public appropriations and guarantees that plagued the national treasury for a century. Despite occasional changes in the rate structure, insufficient revenues threatened to unbalance the budgets of the railway companies and in turn create a cessation of service. Such statism, or *"étatisme*," had already proved its concern by assisting in the construction of roads, bridges and canals. [21]

An agreement in the law of June 1842, which was similar to a concept established by Émile Pereire, one of the Saint-Simonists, stipulated that after a national railway program was drawn up, the government was to find the land – with local authorities furnishing two-thirds of the cost – and to construct the road-bed (the infrastructure), including bridges and tunnels. [22] Companies were then to furnish the super-structure, i.e. rails, ballast, station equipment, rolling stock and working capital. [23]

Under a series of agreements called the Franqueville conventions, which were established in 1859, the six great companies completed their recognized area: the North, East, West, P.-L.-M., Orléans and Southern. There was no competition within the areas, and a number of minor lines that usually received state assistance were authorized, outside the control of the six great companies. The French government disputed with the six great companies about the form of a statutory guarantee for a minimum interest-dividend to the shareholders. It was hoped that such a guarantee would attract the necessary funds for investment and thus relieve unemployment as well as supply transportation needs through further rail construction. [24]

The stronger companies, like those of the North, did not require financial help from the state, but several of the other companies secured a guarantee of interest. In return for its various favours, the state not only required the companies to build a subsidiary network of lines at their own charges, but also overhauled rates and fares in the interests of the public and special trains like post and military needs.

The expectation that the government would eventually nationalize the rail system formed an important element in French railway history. The original agreement of 1842 leased the railway lines to the companies for only 36 years, but Napoleon III extended these leases to 99 years soon after he gained power.

21 Simon A. Doukas, *The French Railroads and the State*, New York, Columbia University Press, 1945, p. 20-21.

22 Robert Bruce Carlisle, *The Saint-Simonians and the Foundation of the Paris-Lyon Railroad, 1832-52*, Ann Arbor, University Microfilms, 1984.

23 John H. Clapham, *The Economic Development of France and Germany 1815-1914*, *op. cit.*, p. 145.

24 Simon A. Doukas, *The French Railroads and the State*, *op. cit.*, p. 13.

Parliament would soon thereafter begin discussions of great length on the question of nationalisation.[25]

Nationalization of French Railways

The end of the nineteenth century saw a marked concentration of the networks, greater levels of state intervention, and greater financial solidarity of the network. Charles de Freycinet, Minister of Public Works at that time, formulated the law of 1878, which remained the basic legislative act committing the state to actual railway operation until the nationalization law of 1937.[26] The Convention of 1883 was affected by the Freycinet plan to solve unemployment after the crisis of 1882, and promoted the construction of the new lines, which resulted in the increase of the state assistance.[27] The Convention of 1883 was thus the indirect cause of the movement for reorganization and nationalization. The companies, the public and the government alike had crystalized a universal sentiment in support of the amelioration of the transport service.[28]

Immediately after World War I, Albert Thomas, the Socialist Deputy, proposed an invocation of the procedure to purchase the railways, as had been envisaged in the Conventions of 1883. Following this logic, he then introduced a bill to the parliament in 1919 to establish the plan for railway nationalization. The bill was vigorously opposed by the companies and was abolished, but in the following years the leftist elements of government would lead the public to a favorable opinion on nationalization, with the increasing members of the trade unions. Nationalization of industry became the slogan of the French workers.[29] There was still a tendency to confuse nationalization with statism, or *"étatisme"* meaning direct state control. French workers have typically been opponents of government control, and have feared the admixture of politics with business, but they did, at this point desire a system of collaboration between the public and workers.[30]

Negotiations between the state and companies were restarted, and resulted in the agreement of June 28, 1921, which was one of the aspects of the general

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25 John H. Clapham, *The Economic Development of France and Germany 1815-1914*, *op. cit.*, p.144.

26 Simon A. Doukas, *The French Railroads and the State*, *op. cit.*, p. 40, 58.

27 Harvey J. Bresler, "The French Railway Problem," *Political Science Quarterly*, vol. 37, no. 2, 1922, p. 211.

28 *Ibid.*, p. 213.

29 Simon A. Doukas, *The French Railroads and the State*, *op. cit.*, p. 121-125; Harvey J. Bresler, "The French Railway Problem," *op. cit.*, p. 215-217.

30 *Ibid.*, p. 219.

problem of the co-ordination of various kinds of public transportation.[31] Between 1929 and 1936, receipts for the major railway companies as a whole fell from sixteen billion to ten billion francs. The continued insufficiency of receipts was due partly to the competition of car transportation, partly to the alteration of the original character of the railway, and partly to the worldwide Great Depression.[32]

The final unification of the French railways began on the 1st of January, 1938 when the Société nationale des chemins de fer français (SNCF) was created, absorbing the former major networks to create one collective.[33] Public power, represented by the state, was then obliged to take the initiative in constructing and operating the railways under its own administration or, indeed, in exercising a strict control over the concessionary companies, or even in guaranteeing to the state a direct participation in their administration.[34] This was not a true nationalization, however; the government owned 51% of the SNCF shares, and the remains of the shares were owned by private shareholders. The staff members of SNCF were not considered civil servants up until 1982, when SNCF was completely nationalized.[35]

French Statism: Advantage and Disadvantage

In the context of the French department of Ponts et Chaussées, which had close control of the construction of roads, bridges and canals, it was inevitable that the new railways would also fall under the government's close control. The government was involved in railway construction from its start, and able bureaucrats supervised and controlled the railways. The technocrats educated at the *Grandes Écoles* like the École polytechnique, École nationale des Ponts et Chaussées, and the École centrale Paris took charge of the industry and acted as surrogate managers of railway companies. The solution the French adopted was to give state technocrats a hand in establishing technical standards and managerial guidelines. Railway entrepreneurs exercised surprisingly little control over their own enterprises. As a result of this proactive approach to technical and managerial matters, which involved public engineers in the

31 Georges Harcavi, "Nationalization of the French Railways," *Annals of the American Academy of Political and Social Science* (*AAPSS*), 1940, quoted in Robert Milward, *Private and Public Enterprise in Europe. Energy, Telecommunications and Transport, 1830-1990*, Cambridge/New York, Cambridge University Press, 2005, p. 217-226. See too Georges Harcavi, *Le Déficit des chemins de fer français*, Paris, Sirey, 1940.

32 Georges Harcavi, *loc. cit.*, quoted in Robert Milward, *Private and Public Enterprise in Europe*, *op. cit.*, p. 221.

33 *Ibid.*, p. 222.

34 *Ibid.*, p. 225.

35 Simon A. Doukas, *The French Railroads and the State*, *op. cit.*, p. 269.

ongoing management of the industry, the French technocrats led the industry through modernization after World War II.[36]

In Britain, RCH, a voluntary organization, coordinated railway companies and settled the rules and regulations for their operation. Professional organizations such as the ICE and IME developed engineering and mechanical concepts, which were possessed jointly by the companies in order to keep up their level of management and operations. In France, the Ponts et Chaussées department supervised the railways and the Consultative Committee of Railways (Comité consultatif des chemins de fer) in the department covered not only the commercial (i.e., rate-making), but also the technical and financial' sides of railway administration.[37] Because of the strong governmental and administrative influence, the six great companies had their headquarters in Paris to keep close contact with the French government.[38]

The French railway policy, however, was based on the principle that railways should be exploited not by the State, but by strong independent companies under strict government control.[39] The state guaranteed the dividends of the railway operating companies, and in exchange took two-thirds of any greater profits that those companies produced. This curious mixture of statism and private industry has fully dominated this aspect of French political economy. The partnership of statism and private industry succeeded in building an adequate network of railways for France. The monopolistic structure and operation of the French railways have eliminated certain costs and wastes which to outweigh any conceivable advantages of competition. Through the grant of monopoly, interline competition, overlapping service and intra-company feuds were discouraged and even prohibited, and with this, the waste of physical resources was reduced to a minimum. The railways of France have operated for over a century as an integral and indispensable part of the national economy.[40]

It was inevitable, however, that this centralization of policy would disadvantage the French railway. As in one famous case, France was defeated at Franco-Prussian War, because the French railway system was too centralized in Paris, and could not effectively transport troops and military goods to the front. The bureaucratization and influence of special interests associated with all governments, even those of corporations, also negatively affected the French railways. Doukas criticized that "it has laid bare a vacillating and not-too-

36 Frank Dobbin, *Forging Industrial Policy*, *op. cit.*, p. 132.
37 William H. Buckler, "The French Method of Controlling Railway Rate," *The Quarterly Journal of Economics*, vol. 20, no. 2, 1906, p. 284-285.
38 *Ibid.*, p. 280.
39 *Ibid.*, p. 284-285.
40 Simon A. Doukas, *The French Railroads and the State*, *op. cit.*, p. 271.

intelligent railway policy that has cost the taxpayers billions of francs and has kept railway finances in constant flux, often bordering on chaos."[41] Historically speaking, a neither private nor public operation of the French railway was successful for the financial performance.

The French statism of railway policy controlled railway network and led companies to avoid wasteful competitions, which discouraged the entrepreneurial spirits of private enterprises. In France, there was not a serious problem of excess lines, as there was in Britain, where Beeching had to destroy the wasteful lines and stations. Overall, the tradition of the French statism supported by able technocrats has continued to the exploration of TGV after World War II.

RAILWAYS AND GOVERNMENT IN JAPAN

Historical background of the relation between the railway and government

The modernization of Japan started in 1868, with the start of the Meiji era, when the government introduced Western industries under the slogan of "wealthy nation and strong power" to catch up the industrialized countries. The Meiji government employed foreigners, called "Oyatoi," who worked in various fields for the modernization of Japan. The number of Oyatoi reached about three thousand at their peak time 1870s, with nearly half of them coming from Britain, and about fifteen percent from France. Starting in 1878, Japanese citizens began to replace the Oyatoi, and their numbers saw a rapid decrease. In 1878 their numbers were at 70, then 43 in 1880, and 15 by 1890.

The government considered the railway to be one of the key industries for modernization, and therefore constructed the first national railway in Japan. Constructed in 1872, it stretched from Shinbashi (Tokyo) to Yokohama, and employed engineers, drivers, and station staff from Britain with British locomotives, carriages, rails and additional equipment. The government issued a bond of 1 million pounds with 9% interest through the Oriental Bank in London.[42] The narrow gauge of 3 feet 6 inches was selected due to its lower production cost; powerful locomotives of that time could draw carriages with some speed even on the narrow gauge.

The government had initially planned to construct the railway by itself, but owing to the scarcity of money, granted the private railway under its strict control and partly subsidized its construction cost. The first private railway,

41 *Ibid.*, p. 270.

42 Nakamura Naofumi, *Nihon tetsudogyo no keisei* [*The Establishment of Japanese Railway Industry*], Tokyo, Nihonkeizai Hyoronsha, 1998, p. 26-36.

which opened in 1883, was Nippon Railway, which ran 731 km from Ueno (Tokyo) to the north of the Main Island. In 1891, it was completed to run all the way to Aomori. Following that, many private railway companies began to build trunk lines during the first railway boom between 1886 and 1889. The second railway boom began after the Sino-Japanese War in 1895, and ended in 1900, when the major trunk lines were completed by the private companies. The total length of the private railway network would eventually amount to nearly twice that of the national railway. The Japanese railway network developed in accordance with the industrial revolution, which saw the rise of light industries in the 1890s, but shifted to be centered on heavy industries in the 1900s.

Nationalization of railways

After the Russo-Japanese War, the government sought direct control of the major private companies to make it easier to connect them with the national railway, especially in times of emergency. In 1906, the government accordingly nationalized 17 major railways. The lines of the Japan National Railway (JNR) increased from 2459 km to 7265 km, which occupied 90.9 % of the total length in Japanese railways. Compared to Britain and France, Japan was the first country to experience a true nationalization of its railways.

After the nationalization process, JNR reorganized its structure and emphasized unification of its employees who had worked under different management and culture. All the employees were considered members of one large family, called new JNR, and cooperated with each other in a corporate culture, which was one of the roots of Japanese management. Lifelong employment, a system of seniority, and trade unions were organized within company, not based on the type of jobs across companies. Most of the top management of JNR was comprised of graduates from the imperial universities. While it was ultimately them who decided the national policy of the railways, they sometimes had to compromise with politicians.

Before World War II, some of the bureaucrats in JNR had proposed the possibility of a change of gauge from the narrow one that was in use to the standard size. Though this would increase the capacity of transport, it soon became a political issue, one that was investigated and debated in parliament. Politicians from local areas wanted to introduce railway lines to their hometown, in order to win the support of their constituents. Eventually, the investment in the railways was directed to the extension of the railways into more local areas, rather than to the conversion of the gauge of the existing railways. That was one of the background reasons that Japan had to build Shinkansen with a standard gauge after World War II.

The prosperity of railways in Japan

According to the table shown before, Japan is the heaviest user of railways among the three countries. To arrive at this figure, the role of private urban railway companies, which are not financed by public money, must be emphasized. The majority of the metro and trams are run by public sectors, but the urban railways are owned by private companies, and among them, the top fifteen companies control 2729 km. In big cities, they compete with JNR and metros or trams run by the public sector, and in the metropolitan area they claim about half of the total railway passengers.

Most of the urban private railways originated from electric trams, and enjoy not only the profit from the transport in the populated cities, but also the diversification of various fields which support railway revenues. For instance, most of the major railway companies run department stores that attract customers living along the railway lines. Some of these department stores developed their branches in areas far from the original railway, and are supporting the railway company. The private railways also have subsidiaries of estate agents and developers which cultivate areas along the lines to attract people railway commuters. The private railways sometimes extend new lines into uninhabited areas and reclaim the land. The companies can accumulate profit from developing the area and increasing the number of passengers for the railway. In some cases, they run hotels, amusement parks, baseball grounds and other urban facilities. The urban railway companies have taken a strategy of diversification which increases the number of passengers and also contributes to the revenues of the companies.

Privatization of JNR

Japanese railway privatization was primarily motivated by three factors: the large deficit of the JNR, bureaucracy, and bad labor relations. The deficit of JNR started in 1964, worsened after the oil shocks in the 1970s, and was in a situation of true bankruptcy in the 1980s. The total deficit of JNR in 1986, for instance, was more than three times the total traffic revenues in that year. An enormous deficit was caused by the competition with cars and airs, but more seriously by the latter two factors, bureaucracy and the labor relations. Bureaucrats, who led the Japanese railway with ambitious spirit before World War II, fell into debt with 462,000 employees at its peak in 1965. They were complacent due to a lack of a sense of crisis, in addition to an antagonistic labor union that increased its power after the war. Drastic reform of JNR was inevitable and necessary; as such, JNR was privatized in 1987.[43]

43 Mizutani Fumitoshi and Nakamura Kiyoshi, "The Japanese Experience," *op. cit.*, p. 306, 315-316.

JNR is now divided into six JR passenger railway companies, each of which controls a region (Hokkaido, East Japan, Central, West Japan, Kyushu, Shikoku) but fares and regulations are standardized for all companies. The freight operation is left to Japan Freight Railway Company covering the nation widely. The Japanese National Railway Settlement Corporation was created to deal with the huge debt amounted to 37 trillion yen which was nearly ten percent of GDP at that time.

Each privatized company is free from many restrictions that were once imposed, and allowed to enter into new businesses similar to the urban private railways. The total number of employees was reduced to 200,000 at the time of privatization. As Gourvish noted, the privatization of JNR was more of an incomplete "quasi-privatization".[44] But in general, the Japanese approach to rail restructuring has succeeded in many ways, especially when compared with the privatization of BR. It has improved productivity, cut operating deficits, decreased fares, and provided better services.[45]

ATTITUDE TO THE HIGH SPEED RAILWAY (HSR)

British approaches to the modernization of railways

Britain tried to modernize its railways all while using the existing tracks, which were laid straightly and evenly as far as possible, through excavation, embankment, bridges and tunnels. The conventional rail truck was available for the modern high-speed railway. Britain began to tackle the task of heightening the speed of railway in the 1970s, after the Beeching Plan was put into effect. There were serious questions to consider: How should it strive for high speed? Was there a role for freight traffic, and if so, what kind? How should the railways be paid for?[46]

The Advanced Passenger Train (APT) project, started in the 1970s, was designed to maximize speeds without introducing expensive new infrastructure, but troubles resulted in its abandonment after short periods of service in 1981-82 and 1984. Following that, the British HSR introduced its second-best technology, which operated at 125 miles per hour (200 kmph) on the Great Western from 1976 and the East Coast from 1978. It became the mainstay of British HSR for over two decades, with a recorded speed of 238 kmph in 1987, and is still in full service from Paddington station.[47]

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44 Terry Gourvish, *The High Speed Rail Revolution: History and Prospects*, London, Department for Transport, 2010, p. 9.

45 Mizutani Fumitoshi and Nakamura Kiyoshi, "The Japanese Experience," *op. cit.*, p. 334; Ian Bartle, *Britain's Railway Crisis*, *op. cit.*, p. 1, 31.

46 *Ibid.*, p. 5.

47 Terry Gourvish, *The High Speed Rail Revolution*, *op. cit.*, p. 12.

The Channel Tunnel Rail Link (CTRL) project progressed in the 1960-75 period, but unfortunately it became a casualty of the difficult economic conditions following the oil crisis of 1973. The British government's anxieties about the cost of the CTRL project, which escalated from £123 million to £373 million in little more than a year, contributed substantially to its decision to withdraw from the Tunnel project in 1975. The second, and ultimately successful, CTRL, now called High Speed 1 [HS1], was opened at London St. Pancras in 2007. It remains the zenith of passenger rail travel in Britain to date. The total cost of the project was in excess of £ 5 billion.[48]

The Department for the Environment, Transport, and the Regions (DETR) published *Transport 2010*, in which it anticipated saving time on existing projects, specifically the completion of the CTRL and the modernisation of existing railway lines. Indeed, for some time the emphasis of rail policy was on upgrading the existing infrastructure of the major routes. (DETR, 3-4) DETR viewed the railways as part of integrated transport, and this was an important motivating factor in the government's construction of a total transport network for the public. As for the HSR project, it might be difficult to deal exclusively with a railway that has such strategic importance.

French approaches to the modernization of railways

Since 1967, the SNCF has been involved in studies that attempt to define the concept of the high-speed railway in France. The first concepts were outlined in 1970 with a proposal to construct a new line between Paris and Lyon, designed around the following three principles: 1. Specialisation of a new line for passenger traffic, 2. Compatibility with the existing railway network, and 3. A high-frequency operating system with reduced load interruptions.

These technical design options for the high-speed railway in France have proven to be reliable. They have made it possible to achieve high commercial speeds of about 240-270 kmph, to optimise the use of TGVs and the commercial capacity of the new line, to reduce operating and maintenance costs of the new line and rolling stock, and to free large freight transportation capacities on existing conventional lines. All these factors have contributed to the growth of traffic and to the increased profitability of the high-speed railway project.[49]

The TGV resembles the Shinkansen in purpose but differs in design philosophy. The differences are somewhat attributable to an attempt to overcome disadvantages of the Shinkansen, and additionally to the different physical

48 *Ibid.*, p. 13.

49 Jean-Pierre Arduin, Ni Jincheng, "French TGV Network Development," *Japan Railway Transport Review*, no. 40, 2005, p. 22-28, quoted p. 26.

characteristics of France and Japan. The most significant difference between the TGV and the Shinkansen is the ability of the former to operate on conventional tracks, which allows for significant savings. It also means that the HSR can serve regions with no HSR infrastructure and specifically serve parts of the network where at present the demand is not high enough to justify the construction of a dedicated line[50] The TGV adopted a push-pull train system which was driven by the electric locomotives, but Shinkansen introduced a multiple unit system in which each vehicle was equipped with an electric motor. More recently, however, TGV adopted a train with a multiple unit system, developed by Alstom.[51]

The French concept (that the HSR should use the existing rail track as much as possible) is also applicable to other railways in neighboring countries, and now HSR in Europe is using this philosophy to branch out into several countries.

Japanese approaches to the modernization of railways

The Japanese railway lines were notorious for their congestion, and the capacity of services and cars was at its maximum for the conventional railways. As noted before, Japan National Railway (JNR) used a narrow gauge with lots of tight curbs and up and downs, which meant that it was impossible for the HSR to run on the existing narrow gauge tracks. Moreover, a tremendous investment was required to recover from the damage of infrastructures during World War II, and to renovate the entirety of the JNR.

JNR had a plan to construct a bullet train to connect Eurasia in 1938, and had started purchasing land for the new railway, but stopped at the end of the War. Nonetheless, engineers still wanted to achieve this dream. Japan's economy began to grow in the 1960s, and this proved to be the ideal opportunity to construct a new railway on the standard gauge. The Tokyo Olympic Games in 1964 were another incentive to hasten this construction. The project was approved in 1958, and construction launched in 1959. The total cost was an estimated 380 billion yen, part of which (80 million dollars or 280 billion yen) would be borrowed from the World Bank.

The Shinkansen owed its success to two key figures. One was Shinji Sogo, the president of JNR, who trusted the ability of Railway Technical Research Institute of JNR, and demonstrated strong leadership in promoting the HSR plan under difficult circumstances. The other was Hideo Shima, chief engineer of JNR, who coordinated technical affairs under the leadership of Sogo. Hara noted that Japanese engineers visited France several times in 1950s and learned the

50 Sone Satoru, "Future of High-Speed Railways," *Japan Railway & Transport Review*, no. 3, 1994, p. 4-5; Moshe Givoni, "Development and Impacts," *op. cit.*, p. 596.

51 Jean Bouley, "A Short History of 'High-Speed' Railway in France Before the TGV," *Japan Railway & Transport Review*, no. 3, 1994, p. 50-51.

possibility of making use of the AC electrification for high speed train. "It was Louis Armand, President of SNCF, who had recommended AC electrification to JNR President Nagasaki during their visit to France in 1953."[52]

In conclusion, the Japanese approach to rail restructuring after World War II has succeeded in many ways. The Shinkansen, undoubtedly the world's leader in terms of volume, safety and punctuality, is now a symbol of the high level of Japanese railway technology. It has enabled trains to retain a much higher mode share of passenger traffic than in any other country.[53]

As final conclusions, British industrial policies have taken a number of forms over the years, but at their core is a commitment to sustaining the autonomy of the firms rather than controlling market mechanisms; to promoting the national interest, as in France; and to sustaining the productivity of the firm, as in Japan.[54] The power of British commercial interests is much higher than that of any continent, and they are able to speak to the government on equal terms, different from other European commercial interests. They determined the lines of their railway systems. In Britain, the railways were presided over entirely by commercial companies, subject only to the few legislative restrictions. The privatization in 1993 split BR into more than 100 pieces, which made it difficult for the British to challenge the dynamic innovation of HSR.

The French government is a conductor of an industrial orchestra. Her political culture constructed state sovereignty as the key to political order, and rail policy made state control over planning, finance, coordination, and competition the key to economic order and efficiency. The state's dominance of technical and managerial matters in the rail industry contributed to French notions of efficiency of state concentration of industry, and to notions of the incapacity of private actors to reach efficient solutions on their own.[55]

France succeeded in its construction of the TGV partly through its use of conventional tracks to cut the expenses, and Britain introduced its Intercity 125 on the existing railway network. Japan had no alternative but to increase the capacity and speed of its railways, without the construction of new line with the standard gauge. In other words, the backwardness of the railways after World War II prompted Japanese to hasten its modernization, in view of its economic growth and the opportunity of a Tokyo Olympic Games.

In terms of speed of railways, JR is currently behind SNCF, but Japanese HSR is transporting more than twice the passengers of the French HSR and it

52 Terushi Hara, "Reflexions," *op. cit.*, p. 39.
53 Roderick A. Smith, "The Japanese Shinkansen," *op. cit.*, p. 233.
54 Frank Dobbin, *Forging Industrial Policy*, *op. cit.*, p. 211.
55 *Ibid.*, p. 140, 166, 214.

is notable that Hideo Shima, "father" of Shinkansen, commented as follows: "Frequency, I believe, is far more vital than higher speed. For unless you boost operation frequency, you can't reduce passenger fares and attract more customers. From now on, the first priorities of train transport must be low energy, safety and comfort."[56] He suggested the fundamental idea that Japanese HSR should aim at the present and the future.

56 Roderick A. Smith, "The Japanese Shinkansen," *op. cit.*, p. 236.

TABLE DES MATIÈRES

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TERUSHI HARA, HISTORIEN DES ENTREPRISES ET DES PROCESSUS D'INTÉGRATION INTERNATIONAUX