Integrated vs. Non-Integrated Railway

By Anthony Hsiao

1 Introduction

In 1943, the British Railways Board claimed, that the British railway was the best in the world. The British were amongst the railway pioneers; it transformed the country, made most of London possible, enforced standard time and was a vital motor of the industrial revolution. The British were also amongst the first to privatise their railways again in 1994/5 as a response to an EU directive (EU 91/440/EG) pushing liberalisation in the railway industry, and were certainly the fastest and the most extreme in Europe. While it is difficult to verify the validity of the British Railways Board’s claim, it is unlikely that anyone would make this claim today. Commentators describe the privatisation of the British Railways as a prime example of how not to privatize an industry, and it has served as a case study and anti-role-model for other countries, such as Switzerland.

The Swiss railway, on the other hand, is nowadays said to be amongst the best in the world. Although Switzerland is not a member state of the EU, it also responded to EU 91/44/EG (since it makes sense for the country at the heart of continental Europe to integrate the railway system with its neighbouring countries), but in a completely different manner to the UK.

While the UK completely split up its industry, leaving it with rolling stock companies (ROSCOs) that own the trains, a monopoly track owner that owns most the infrastructure and train operating companies (TOCs) that operate the trains leased from the ROSCOs and paying a subscription fee to use the tracks and infrastructure, Switzerland maintained a fully integrated railway system, that manages everything from under one roof.
Here, I would like to compare the approaches taken by these two countries, (fully) integrated against (fully) disintegrated railway, and assess which model response to the EU directive achieved its targets better.

2 Historical heritage of the British and Swiss railways

2.1 British Rail

The rail transport system in the UK developed during the 19th century. The Railways Act 1921 grouped the industry into four large privately owned railway companies, the Big Four, each dominating its own geographic area:

- Great Western Railway
- London, Midland and Scottish Railway
- London and North Eastern Railway
- Southern Railway

The profitability of the railways suffered during the great depression during the 1930s which meant that the state of the British railways was already poor before the Second World War. During the war, the railways were taken into state control as a vital part of the wartime economy, and were heavily damaged by enemy action. In parallel with the rest of Britain's economy, the railways were in a very run-down state after the war.

The Transport Act 1947 made provision for the nationalisation of the network, as part of a policy of nationalising public services by the then Labour Government of Clement Attlee. Then, the Railway Executive of the British Transport Commission (BTC), with business name of British Railways, was formed and took over the assets of the Big Four on 1st January 1948.
The new system was split geographically into six regions along the lines of the Big Four:

- Eastern Region
- North Eastern Region
- London Midland Region
- Scottish Region
- Southern Region
- Western Region

These regions formed the basis of the British Railways’ business structure until the 1980.

The Transport Act 1962 converted British Railways from being the business name of a BTC activity to an independent public corporation.

Some cynics claimed the logo was really called the “arrow of indecision” and meant the railway did not know if it was coming or going.
Following the EU directive 91/440/EG in 1991, the British Rail was privatised fully, on the advice of the Adam Smith Institute, under John Major’s Conservative government’s Railways Act 1993.

### 2.2 Swiss Federal Railways

The first ever Swiss Railway was opened 1847 and connected the two cities Baden and Zurich. Growing in importance, the previously Kantoally organised and managed railway system was declared to be matters of Federal interest, improving coordination of the privately owned ventures (the economic and political interests of these companies led to lines being built in parallel and subsequent ruinous competition, driving some companies into bankruptcy). On 20 February 1898 the Swiss people agreed in a referendum to the foundation of a state-owned railway company. The first train running on the account of the Swiss Confederation ran during the night of New Year's Day in 1901 from Zurich via Berne to Geneva. 1\textsuperscript{st} January 1902 is regarded as the official birth date of the Swiss Federal Railways, SBB (Schweizerische Bundes Bahn). In the meantime, the trains were run by the Swiss Confederation on behalf of the private companies. The following railway companies were nationalised:

- Aargauische Südbahn
- Bötzbergbahn
- Schweizerische Nordostbahn
- Schweizerische Centralbahn
- Toggenburgerbahn
- Vereinigte Schweizerbahnen
- Tösstalbahn
• Wohlen-Bremgarten Railway

• Jura-Simplon-Bahn

Other companies were included later, and the rail network was extended. It is still growing today.

The SBB continued to grow and evolve, with a major change in 1982 when it introduced the *Taktfahrplan* ("regular interval schedule"), with trains for a given destination leaving every 60 minutes. This greatly simplified the timetable.

Since 1999, the SBB is a special stock corporation with all its shares held by the Swiss Confederation. However, it is still run as a market oriented company, with financial targets set by its shareholder (the Swiss Confederation) every four years.

3 The EU and Railways

"*The aim of this Directive is to facilitate the adoption of the Community railways to the needs of the Single Market and to increase their efficiency;*

- Article 1 from EU Directive 91/440/EG

The EU issued the directive 91/440/EG on 29th July 1991 in order to revitalise the railways in Europe, by liberalising the market. At the heart of this directive stands the instrument of open market competition to spur supply and demand, which, it is hoped, would improve service levels, reduce prices for customers and foster innovation. It aims to achieve this through the following four measures, by:

• ensuring the management independence of railway undertakings
• separating the management of railway operation and infrastructure from the provision of railway transport services, separation of accounts being compulsory and organizational or institutional separation (see below) being optional

• Improving the financial structure of undertakings

• ensuring access to the networks of member states for international groupings of railway undertakings and for railway undertakings engaged in the international combined transport of goods

The second and fourth points are crucial. In order to revitalize the industry and improve services, the EU wants to encourage competition. In order to achieve competition, railway transport services must be able to access the infrastructure of member countries freely, and under equal terms. In order to do that, the infrastructure and operations would have to be separated.

The EU identifies three possible levels of separation:

1. separation of accounts – P&L statements and balance sheets for the provision of transport services and operation of the railway infrastructure are accounted for separately

2. organisational separation – provision of transport services and operation of the railway infrastructure are managed and executed in organisationally separate divisions or business units of the same company

3. institutional separation – separate companies provide for transport services and operate the railway infrastructure
The directive explicitly requires the first level of separation, but does not require any of the other two, leaving individual countries space and scope as to how to implement this directive.

Indeed, Germany, France and Switzerland for example have so far successfully defended the traditional integrated railway, while eight other countries including the UK, Sweden or Portugal have gone further and followed the institutional separation.

4 Integrated vs. non-integrated railway

When speaking about the separation of infrastructure from the provision of rail transport systems, one is generally speaking about the ongoing debate of the integrated railway versus the non-integrated railway.

In the model of the integrated railway, which is still the dominant form of railway in the world, infrastructure and the provision of transport services are integrated under one roof, either as separate companies under the same holding, or as separate business units or divisions of the same company. Business decisions, including infrastructure development, are made in order to maximize the profit of one, and only one, service, namely transportation service (goods or people) by rail.

Conversely, a non-integrated railway system would entail separately acting companies, each maximizing their own outputs, independent of the other.

The arguments for the non-integrated railway are mainly based on market-theoretical considerations, and are intuitive. Believers in the invisible hand of the market would greatly appreciate how breaking the railway down into smaller independent and competing entities would lead to better service and cheaper prices, just as the EU is envisioning.
However, these considerations are not necessarily applicable to the railway system, and here I would like to just outline a few arguments for the integrated railway.

- **Railway is an interconnected system** – The railway industry is a complex business which requires sophisticated control systems. It entails the day-to-day management and coordination of equipment and thousands of employees. The value chain of the final product – transportation service by rail – includes the train stations, the railway infrastructure as well as trains, and the maintenance thereof. The individual stages in the value chain are intricately linked and only the sum of all parts make transportation by rail a market ready product. The optimization of the entire value chain can therefore only be achieved by one integrated company.

- **Clear responsibility** – From a customer’s point of view, the railway is one entity. He/she is not concerned with how many steps in the value chain or how many different companies are involved in providing the service. Either, transportation by rail is a market ready service, or the customer seeks an alternative, such as transport by road or by plane. This one point of contact for the customer is also the owner of the responsibility, especially concerning safety. A prominent example is that of the Hatfield accident in the UK, where the infrastructure owner Railtrack could not repair a defunct track, due to contractual clashes with the independently operating train operators.

- **Scheduled traffic** – most traffic on rails is what is referred to as systematic traffic, whereby the entire network and its schedules are pre-planned; trains depart and arrive at given times at given stations. There
are few degrees of freedom, and optimizing such a complex network is only possible out of one integrated company.

- **Railway is one integrated technology** – innovations in railway technology have always been for an integrated system including both tracks and trains. The creation of high-speed trains such as the TGV in France for example relies on the interplay of both the train’s speed and aerodynamics, as well as on the tracks’ ability to support such a high-speed train. Similar arguments apply to the development of magnetic levitation trains or to new electronic signalling or control systems.

As we will see, the British and the Swiss railway systems are polar opposites, with the British having a fully liberalised non-integrated system, probably the most extreme form of institutional separation in Europe, while the Swiss railway is a fully integrated but efficient company.

5 The state of the British and Swiss railways today

5.1 The Heritage of British Rail

Following the advice of the Adam Smith Institute, British Rail was split up and fully privatised under John Major’s Conservative government’s Railways Act 1993 (effective since April 1994). It established a complex structure for the rail industry.

British Rail was to be broken up into over 100 separate companies, with most relationships between the successor companies established by contracts and some through regulatory mechanisms. The infrastructure (tracks) was handed over to a regulated monopolist, Railtrack. Passenger services have been split up into 26 separate Train Operating Companies (TOCs) in order to ease entry into and exit out of the business, and to facilitate competition. A precondition of
putting rail services out to tender was that vehicles were available. This has been achieved by creating three Rolling Stock Companies (ROSCOs) of approximately equal size. These would lease out vehicles to the TOCs. In order to be able to operate in the first place though, these TOCs had to obtain a so called franchise agreement from the state lasting between 7 and 15 years, which were first established with the Office of Passenger Rail Franchising (OPRAF), then its successor the Strategic Rail Authority and now with the Secretary of State for Transport. No simple matter.

Then, the TOCs would bid for the right of operating a certain train system – leased from one of the ROSCOs – on a certain line or from a certain station – paying track charges to the regulated monopoly Railtrack. The TOCs promise to maintain frequencies and not raise ticket prices, and for this they get subsidies from the OPRAF.

The freight services were divided up in companies which have been sold with vehicles, locomotives and staff. 80% of the freight services have been bough up by the American company Wisconsin Central Transportation in '96 and merged into English, Welsh & Scottish Railway (EWS) – Wisconsin’s management commented, that it would cost 20% more to run the companies separately, amusing cynics, annoying critics.

The Transport Act 2001 (effective February 2001) called the Strategic Rail Authority (SRA) into action, replacing the OPRAF, to provide strategic direction to the railway industry and to intensify public interest regulation of the fragmented railway network. It’s most prominent role was that involving the Hatfield rail crash in 2000, after which the SRA was expected to impose a solution to the shortcomings of Railtrack’s maintenance efforts – which caused the crash and resulted in major chaos following it – but the SRA did neither
have the power nor the knowledge to do so. Following the passing of the Railways Act 2005 the SRA was wound up on 1 December 2006 and its functions transferred to the Department for Transport Rail Group.

Following the mismanagement of Railtrack, it was put into ‘railway administration’ (a special kind of insolvency for railway companies which ensures continuity of operation of railway services) by the English High Court on the application of the Secretary of State for Transport. On 2nd October 2002 the administration order was discharged and a new organisation, Network Rail, bought Railtrack PLC from its parent Railtrack Group PLC. Network Rail has no shareholders and is a company limited by guarantee.

As an interesting postscript to the privatisation, in July 2006 the Conservative Party’s shadow transport spokesman, Chris Grayling, admitted that the 1996 split of the rail industry into track and train components was a mistake which had increased costs: "We think, with hindsight, that the complete separation of track and train into separate businesses at the time of privatisation was not right for our railways. We think that the separation has helped push up the cost of running the railways - and hence fares - and is now slowing decisions about capacity improvements. Too many people and organisations are now involved in getting things done - so nothing happens. As a result, the industry lacks clarity about who is in charge and accountable for decisions."

In summary, the British railway system is divided up as follows:

- **Tracks and infrastructure:** Network Rail owns and runs, maintains and develops the UK’s tracks, signalling system, rail bridges, tunnels, level crossings, viaducts and 17 key stations

- **Train operators:** currently 24 different TOCs
• **Freight train operators:** Consolidated, mostly owned by EWB, but others exist

5.2 The Swiss federal railway, ready for the future

Switzerland was cautious not to dive into hasty responses to the EU directive 91/440/EG, and it took as long as eight years, before the ‘Bahnreform’, i.e. the reform of the railway, came into effect, in January 1999. The key points of the reform were clearly set, and included:

• **Complete Open Access for freight rail**

• **Separation of infrastructure and rail transport operations:** Switzerland chose an organisational level of separation, with separate accounting for infrastructure and transport operations, which are managed as separate divisions of the SBB.

• **Reform of the financing of the SBB:** Financing agreements between the Swiss Confederation and SBB are made every four years, with clear targets and allowed prices.

• **Strengthening of systematic traffic:** The Swiss passenger railways continue to rely on scheduled systematic traffic, and concessions for (international) third party train operators running on SBB tracks (e.g. on a journey through Switzerland) remain unchanged.

Together with the reform, the SBB was transformed, as mentioned earlier, into a special stock corporation with all shares held by the Swiss Confederation. Today, it is organised as follows:

• **Division Passenger Traffic:**

• **Division Freight Traffic (SBB Cargo):**
• **Division Infrastructure (SBB Infra):**
• **Real Estate**
• **Staff Functions (finances, personnel)**

Therein, the infrastructure division is a separate business which sells track usage to its customers – including SBB Cargo and ‘normal’ passenger traffic, as well as third party users.

### 6 Comparison

So then, both countries have responded to the EU’s required liberalisation of the railway markets in very different ways. While the UK went for a fully liberalised model, separating train operators from track operators to create competition in their railway industry, the Swiss have remained a fully integrated railway company with one division fully devoted to the provision of track usage to its customers (including in house and external ones).

In order to determine which approach was better, i.e. achieved the desired results to the EU directive better, I will compare the two models under two aspects: the first is the degree of liberalisation; the second is general operating statistics.

### 6.1 The LIB Index

The Rail Liberalisation Index, LIB, is an index that measures the degree of railway liberalisation, and was commissioned by Deutsche Bahn AG from IBM Business Consulting Services in conjunction with Professor Dr. Dr. Christian Kirchner, Humboldt University, Berlin. It reflects the relative height of the market access barriers from the perspective of active external rail operators and potential new market entrants. Here, the LIB index of 2004, which is the most
recent one available, is used. Figure 4 below shows the results of the LIB index 2004, and indicates, that Great Britain and Switzerland belong to the same group of countries, which are said to be ‘on schedule’ with their railway reforms. It should be noted, that although the UK fares slightly better, from the LIB index’ point of view, both countries progress is ‘acceptable’.

The LIB index is actually derived from two sub indices, the LEX and the ACCESS, with a weighting of 30% and 70% respectively.

Within the LEX Index, the subject “Regulation of Market Access” (45%) has the greatest weight, followed by “Powers of the Regulatory Authority” (30%) and “Organisational Structures of the Incumbent” (25%). Figure 5 below illustrates the results of the LEX index 2004. Again, the UK fare very well, but Switzerland is still regarded as being within the same league of external-rail-undertaking friendliness.
The ACCESS Index is weighted at 70% of the overall LIB index, and is a measure of the openness of the country's railways. Figure 6 below shows the ACCESS index for several countries in comparison, and indeed, Switzerland is again within the same group of the UK, and is in fact not far behind the UK, in terms of accessibility of their railways.
6.2 General operating statistics

So now we have seen, that although the Swiss railway is using a completely different, integrated, railway model to the UK, it fares similarly as the UK in terms of its degree of liberalisation, even though the UK is always ‘ahead’. So if both models achieved similar levels of liberalisation, which in turn is supposed to create competition, improve efficiency, improve service and so forth, then how do these two railway systems actually compare?

Here, I will compare the two railway systems briefly based on punctuality, customer satisfaction, and subsidy required per customer kilometre. I believe that these measures are a good basis of comparison of the two railway systems, because they reflect the quality of the system and its ability to create satisfied customers as well as to account for the cost the systems come at, independent of the size of the actual railway networks.
Furthermore, in order to be able to compare prices, I will follow the Economist’s Big Mac Price Index’ methodology, and quote prices in units of Big Mac rather than local currency. The underlying assumption is that currency exchange rates fluctuate and are not representative for comparisons. Instead a global corporation like McDonald’s is expected to be able to manufacture its goods, such as the Big Mac, at similar costs all throughout the world, and that price differences would be due to difference in local price levels. Thus, the BPI is similar to the OECD’s standard basked of goods, but slightly more simple.

The results are summarised in Table 1 below.

<table>
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<tr>
<th>Country</th>
<th>Subsidy per passenger km</th>
<th>Customer satisfaction</th>
<th>Punctuality</th>
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<tbody>
<tr>
<td>UK</td>
<td>GBP4.6bn subsidy, 10.6bn passenger km =&gt; 43.3pence per pkm =&gt; 0.145 Big Mac per pkm</td>
<td>81%</td>
<td>86.4%</td>
</tr>
<tr>
<td>Switzerland</td>
<td>CHF1.843bn subsidy, 14.3bn pkm, =&gt; CHF0.129 per pkm =&gt; 0.0204 Big Mac per pkm</td>
<td>76.88%</td>
<td>97%</td>
</tr>
</tbody>
</table>

Table 1: General operating statistics in the UK and Switzerland, in 2006

This shows us two things, first and foremost: the Swiss railway system can operate better, i.e. is more punctual (arrival within 5mins of scheduled time) at a lower cost to the state. This is a very important finding, since the liberalisation is supposed to reduce prices of operation by the introduction of competition. Instead, it appears, the British railway system still requires much higher
subsidies as the Swiss, indicating that the increased competition did not have the desired effects. The fact that the Swiss system has a lower customer satisfaction result is attributed to a difference in expectations. While the British railway customers are actually ‘happy’ about the service offered, I postulate, that they are happy that the trains run at all, whereas the Swiss customers are much pickier and are more difficult to please. Their standard is very high and therefore, they expect a very good quality service.

My personal experience from both railway systems actually confirms this, that after a while, you get used to the local standards, no matter how good or bad the railway systems are.

7 Conclusion

In summary, I have tried to outline the EU directive 91/440/EG and some of the consequences it has brought about in the UK and Switzerland. The directive was issued in order to increase competition and to revitalise the industry. The instrument through which to achieve competition was the opening of the railway network. While the UK took a very extreme form of complete liberalisation, the Swiss railway is still fully integrated.

By comparing the two systems by the LIB index, it was found that although the UK is slightly ahead with their liberalisation efforts, Switzerland is considered to be amongst the same group of countries that are ‘on track’ with their liberalisation efforts.

From a performance point of view, the Swiss integrated railway system actually performs better, in terms of quality and punctuality and does all this at a lower unit cost to the state. The difference in customer satisfaction is attributed, not to
the actual different service of the railways, but to the differences in expectation of the railway system in the respective cases.

One important concluding remark is, that the way the Swiss railway system operates, as efficient, well organised and accessible as it is, lies at the heart at what I would call ‘being Swiss’. Culturally and socially, the railway plays an important role, because it allows people to live at home in more remote areas in the mountains, while still being able to access the big cities in a matter of an hour. Without an efficiently run system, the Swiss could not enjoy this freedom.

References


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