

Desmaris, Christian

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## High speed rail competition in Italy: A major railway reform with a "win-win game"?

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# High Speed Rail Competition in Italy

A Major Railway Reform with a “Win-Win Game”?

11

**Discussion Paper 2016 • 11**

**Christian Desmaris**

Laboratoire Aménagement  
Économie Transports,  
University of Lyon, France

## **High Speed Rail Competition in Italy**

### **A Major Railway Reform with a “Win-Win Game”?**

**Discussion Paper No. 2016-11**

Prepared for the Working Group on  
Public Transport Market Organisation and Innovation

**Christian Desmaris**

Laboratoire Aménagement Économie Transports, University of Lyon, France

**September 2016**

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International Transport Forum  
2 rue André Pascal  
F-75775 Paris Cedex 16  
contact@itf-oecd.org  
www.itf-oecd.org

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## Abstract

*The European railway industry continues to undergo reform and liberalization due to European law incentives. Recent events in Italy give the country a special place in this process: a new competitor has commenced operations in the high-speed rail (HSR) market based on a private initiative. This paper aims to investigate this rail transport innovation looking for the driving forces and obstacles and to identify the main impacts for the Italian consumers. We also try to provide some interesting results helpful for other countries regarding passenger rail reforms. Based on the Italian case, it seems that open access competition in the HSR market is able to produce significant improvements in favour of passengers and also a ‘win-win’ game between all railway actors.*

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The European Commission argues that rail renewal contributes to achieving the objective of a sustainable transport system (European Commission, 1996, 2011; Ponti and al., 2013). Competition is supposed to be the best way to reverse declining competitiveness and attractiveness of rail transport. For long-distance passenger traffic, European law advocates 'open access' competition. But, in practice, very few European countries allow on-track competition and very few newcomers have decided to enter those markets. New entrants have been deterred by a lack of profitability and by advantages possessed by the largest network operator, the state-owned incumbent. This has limited open access operations to selected niche markets (Nash, 2008; Preston, 2012).

One example of a new entrant is NTV (‘Nuovo Trasporto Viaggiatori’) in Italy, which, since spring 2012, has been taking on the state-owned incumbent, Trenitalia. Italy is the only European country to have opened its high speed railway (HSR) network to competition. This reform seems to have produced huge effects on mobility patterns and some “win-win” results. The entry of a new operator is a major event has focused on the high speed part the rail passenger transport business, the most high-tech segment, and also the most profitable.

Our research is based on a literature review, both academic and professional, as well as on rail statistics. We complement this approach with interviews of actors, as two Italian companies as the sector regulator.

This paper analyses this major step in Italian railway reform and is structured as follows:

- (1) How did this public transport innovation come about?
- (2) What forces encouraged this reform, but also what kind of obstacles did this reform have to overcome?
- (3) What are the main impacts and effects of this reform for the consumers and the Italian transport system?
- (4) What are the critical factors in the successes and the on-going challenges facing the reform?
- (5) Regarding the Public Transport Market Organization and Innovation issues, what are the main lessons we can draw from this case study?

## **Reform background: An institutional framework redirected in favour of rail competition**

The arrival of a new competitor in Italy’s HSR market is a major step in the Italian railways’ reform and liberalization process – and even in the European public transport context. It took place in a railway institutional framework open to competition and aligned with the model advocated by the European Union (EU). This private initiative received a strong domestic political support.

At the beginning of the 1980, the Italian railways were a strong double monopoly – monopolists in the supply of railway services and monopolists in the demand of many assets -, but very however (or

also) atypical. The Italian railways sold below market value and bought at abnormally high prices. Managing a wide range of activities, not closely linked to the core business, the Italian State railway Company had become a conglomerate benefiting from significant public subsidies, which could be considered very generous and ‘protective’ (Senn and Cini, 2011).

This unusual and costly situation is probably the reason why the railway reform began early in Italy. In the middle of 1980, the Government became convinced that the Italian railways needed to be deeply restructured to increase both efficiency and effectiveness. A reform program was embarked upon that followed the European railway reform approach.

The first aspect of the reform was the corporatization of rail services and infrastructure. In 1985, the Government allowed Ferrovie dello Stato (FS) – today renamed Ferrovie dello Stato Italiane (FSI) – to be an autonomous undertaking. In 1992, it had been converted to a joint-stock company, but still wholly-state-owned. A little after, in 1998, complying with the European railway legislation, the Italian government decided to vertically separate the infrastructure and services of FSI. Management of passenger service was given to Trenitalia, while the management of the railway lines was assigned to the infrastructure manager, i.e. Rete Ferroviaria Italiana (RFI). However, RFI is fully controlled by FS Holding, which also owns Trenitalia and remains 100% state-owned.

The second main aspect of the Italian rail reform concerned the wide restructuration economic program of FS. The reorganization of FS was required by two directives of the Prime Minister (in 1997 and again in 1999). The principal target was to achieve an economic and financial recovery requiring among others things a strong effort to increase the labour productivity and the revenue, an optimization of non-strategic assets and a significant increase of rail traffic. All these targets have been achieved, except the last one (Senn and Cini, 2011). The most visible result had been the increase in the reduction in the number of employees, heavily downsized to more than 65%, from over 220 000 in 1980 to about 72 000 in 2012; which was much more drastic and tougher than in most of others European countries. Basically, FSI succeeded to recover its economic and financial equilibrium, by controlling its costs and by raising passenger tariffs.

The Italian railway regulation has closely followed the European doctrine in favour of rail competition. The EU’s rule requires that for freight and long-distance trains, competition among the railway undertakings is the rule and public subsidies are admitted only in specific cases. In Italy, open access to the rail network for these services has been in force since 2001 (Law 388/2000), well before it was compulsory under the EU’s rule. The liberalization of freight market has resulted in a market share of the newcomers of about 30% and more on some international corridors (40% on the Brenner route connecting Italy with Austria). The Italian railway sector has, at least theoretically, opened its passenger rail market, just like Germany, Great Britain and Sweden, and well ahead of the deadlines set by the EU. Nevertheless, in practice, several obstacles remain, and for passenger traffic the share of new entrants was negligible until the arrival of NTV (Senn and Cini, 2011).

Although the railway liberalization process in Italy was one of the earliest in Europe, paradoxically the responsibility for regulation of the railway companies was for a long time retained by the Government (Senn and Cini, 2011). From 11 August 2004 to 14 January 2014, an office of the Ministry for Transportation, called Ufficio per la Regolazione dei Servizi Ferroviari (URSF), played the role of the Italian Regulatory Body (Stanta, 2013), established following the prescription of the European legislation (Directive 14/2001). The Italian rail regulator was only made truly independent from government through the creation of ART (Transport Regulation Authority) on 17 September 2013, by the decree-law 6 December 2011 n. 201 (becoming operational on 15 January 2014). This is very recent compared with other major European countries.



To illustrate the impact of the railway reform on the Italian rail industry structure framework, we propose the following table (Table 1). The initiative of the reform has been taken at a national level and the main impact is the measure in favour of open access competition and the arrival of a new private competitor on the HSR market.

Table 1. **Italian HSR market structure framework: before and after reform**

	Public			Private		
Planning (initiative)	National <b>X, Y</b>	Region/ City	Local			
Service delivery	<b>X</b>			Direct award	Tendering	Open competition <b>Y</b>

Note: X means “before reform”; Y “after reform”.

Source: Authors, discussion in OECD Public Transport Market Organization and Innovation Working Group.

## Motivations for the reform and pressures against it

On-the-track HSR competition in Italy took place in an environment of adverse European macroeconomic conditions and declining Italian railway demand. It has also had to face considerable barriers to entry and the risk of non-cooperative behaviour of the incumbent. Facing these negative aspects, the new operator’s shareholders opted for an ambitious strategy of costly investment and an innovative rail business model.

### A negative European macroeconomic environment and a declining Italian railway demand

Of all the major European countries, Italy is one for which the rail passenger transport market is the least dynamic. This has been the case since the 1990s, until NTV’s entry in 2012. The incumbent’s service offer and demand had both been generally sluggish. This can be observed in the overall passenger supply and demand, expressed in train service kilometres and passenger-kilometres (FSI, 2014, 2010) (Table 2).

Table 2. **European Railway Company’s performance**

	Supply 2010 in Train-kilometre (Million) (a)	Change since 1995	Traffic 2010 in Passenger-kilometre (Billion) (b)	Change since 1995
SNCF (France)	395.9	28.6 %	84.9	53.4 %
DB (Germany)	674.9	5.4 %	77.2	27.6 %
FS (Italy)	265.9	3.8 %	43.3	-1.2 %
ATOC (UK)	507.4	36.3 %	53.3	77.7 %
RENFE (Spain)	156.5	29.2 %	21.0	37.0 %
SBB (Swiss)	136.0	50.5 %	16.9	44.0 %

Source: Our calculations, from UIC. (a) Passenger trains; Table 41. (b) Domestic and international traffic; Table 51.

The low growth of passenger rail services in Italy is due to two factors. Firstly provincial and regional authorities have not increased traffic on their territories (Stanta, 2013). Secondly the State has reduced long distance supply, in part because bus market liberalization has increased competition for long distance travel. As for operators, the low level of subsidization of regional traffic (one of the lowest in Europe (Cesarini, 2013)) leaves little room to invest in the renewal or extension of capacity of the rolling stock.

A part of this sluggish railway demand is also due to the severity of the economic crisis, whose effects are acutely felt in Italy: total passenger-kilometres fell from 50.2 billion in 2006 to 44.6 billion in 2012 (an 11.1% reduction). By comparison, over the same period, in France the decrease was only - 0.8%, in Spain -2.8%, in Greece -54.1%, the most crisis-affected European country.

The economic crisis is not the only reason for this weak railway demand. The number of passenger-kilometres in Italy had increased only slightly during the 1990s and remained stable from 1999 to 2006, with about 49 billion per year (UIC, 2013). Historically, the attractiveness of rail in Italy is comparatively rather low. The modal share of rail passenger transport is in the lower middle range among European Union countries, with 6.1% of passenger-kilometres in 2012 (EC, 2015), against 7.7% on average in the EU15 (9.3% in France, 8.4% in Germany and 8.0% in the UK).

It's in this unfavourable rail context that NTV has decided to compete on the high speed rail market in Italy. Such a decision therefore requires further examination.

### **An ambitious and innovative Italian entrepreneurial approach**

NTV was established in December 2006, by several Italian private entrepreneurs, Luca di Montezemolo, Diego Della Valle, Gianni Punzo and Giuseppe Sciarrone. Later, the French national incumbent (SNCF) acquired NTV shares as a “technical partner”, without any involvement in the management, and now SNCF holds 20% of the shares. NTV launched its first trains in April 2012 (Baron and Ciry, 2012).

NTV's initial objectives were ambitious: to acquire 20-25% market share by 2014-2015; to break even by 2014; and to open, in a second stage, new destinations – Bologna, Padova, Venice and Turino (Sia Conseil, 2012). NTV's strategy is based on several principles: a massive investment able to bring a supply shock in the Italian railway market; a radically modern offer based on differentiated services, on comfort and on a modern image; and, a unique rail business model.

NTV's initial supply shock required a massive upfront investment. NTV has invested over EUR 1 billion, including EUR 628 million in the purchase of 25 modern AGV trains and EUR 90 million in the maintenance site in Nola, near Napoli (Sciarrone, 2014; Stanta, 2013). From a theoretical point of view, this strategy makes sense because it has allowed NTV to benefit from positive economies of density and network economies (Preston, 2012). For its start-up, NTV has also created jobs, approximately one thousand direct jobs and almost the same amount of indirect jobs (Stanta, 2013).

Italo (NTV's service brand name) offers three travel environments or classes, as in airplanes: Smart (economic), the Prima (Business) and Club (First Class). Smart offers a special coach for viewing high-definition movies. The Club is equipped with individual video screens to watch live TV and meeting rooms. Italo also offers free Wi-Fi access for all passengers, a food vending machine (and a cold meal service in Prima and Club), passenger information displays in each car, and even a video surveillance security system in luggage areas.

NTV's fundamental innovation lies in its business model (Sia Conseil, 2012). The NTV's cost structure is inspired by the 'low cost' airline. Fixed costs are minimized, with an overwhelmingly digital ticket distribution system, and even exclusively digital at the beginning. Customers can still buy tickets directly on trains or terminals in main train stations, but not at regular stations elsewhere on the network. The innovative pricing system is based on yield management as in France (drawing on the expertise of its partner, SNCF). Many tasks are outsourced: maintaining costs of rolling stock, catering, security and the call centre. The objective is clearly to keep costs low in order to have a lower profitability point than the incumbent. Furthermore, NTV management introduced an incentive-based remuneration model for staff. The share of individual and collective incentives in the remuneration is high, under an exception to national law. The total salary can increase by up to 25% above the base under a system of individual and collective bonuses. There is also a profit sharing arrangement based on the firm results.

The objective of NTV's approach is clearly to enhance services quality while increasing productivity and keeping costs down.

### **Barriers to entry and risk of non-cooperative behaviour of the incumbent**

The rail industry, for example due to its sub-additive costs, is characterized by many barriers to entry and exit (Nash and Preston, 1992). Introducing competition is most successful where barriers to entry and exit can be reduced through a reduction in sunk costs (Preston, 2012). Both tangible and intangible entry barriers are present in the rail market.

The main tangible entry barrier is fair access to existing network infrastructure, terminals, depots, maintenance facilities and retail areas, which are owned by RFI and to whom charges must be paid. Further large investments are required to enter the market which might deter potential new entrants, such as rolling stock (where the second hand market is poorly developed). Ensuring fair access to retail facilities, information and ticketing systems and computer systems reservation can also be problematic.

Tangible barriers are usually reinforced by less tangible barriers. Among them, the 'innocent barriers' relate to economies of experience, preferential access to capital and brand loyalty. These 'innocent barriers' might be reinforced strategically by reputational and size effects. Larger firms may be able to withstand competitive battles longer than smaller and can develop strategies to block entry, for example, by saturating the key infrastructure paths.

In the Italian HSR new competition, several authors and some newspapers suggest that NTV had to face and overcome several practical barriers to successfully enter the Italian HSR market. For example, Bergantino et al. (2015) argued NTV faced discrimination regarding slots in some stations (NTV initially didn't provide HSR services to several main railway stations such as Milano Centrale). This could have been a deliberate strategy by NTV to avoid entering the heart of the city, where speeds are reduced, or the result of Trenitalia lobbying FSI, but from the outside it is not possible to know. Similarly, the initial lack of ticket machines in railway stations may also have been due to an entry barrier, but NTV presented it as a positive element of its commercial offer, i.e. fully digital.

Entering a railway market always takes time. For NTV, it took one year to obtain the railway license from the Ministry for Transportation. It took even longer to obtain the authorization to operate the new trains from the Italian National Agency for the rail safety (ANSF), in March 2012, after nearly three years of assessment (Stanta, 2013). NTV perceived this timer period as excessively long and as a barrier to entry, which prompted them to appeal to the Antitrust Authority several times (Stanta, 2013). The Antitrust Authority issued several reports to clarify relevant matters about the access to the infrastructure and started comprehensive investigation to check if RFI and Trenitalia abused their powers to make the

start-up of Italo slower and harder. The Authority found no evidence of abuse of the incumbent’s dominant position.

## **The main outcomes of the railway reform**

NTV’s entrance produced effects both for intra-modal competition (inside the railway sector) and for inter-modal competition (with other transport means, such as air and car travel). We can also observe positive effects on the whole Italian railway system.

### **A strong supply shock with high consumer benefits**

As suggested by theory, HSR competition in Italy has produced a triple competitive effect: more capacity, frequency and connections, lower prices and better services delivering high consumer benefits.

Firstly, the entrance of NTV has led to a large increase in the overall supply of high speed train services. Then when Italo services commenced in 2012, a huge increase in supply of HSR services was observed: the commercial service was quickly built up to 50 train services per day, hourly frequency between Milano and Roma, bi-hourly frequency between Roma and Venice, 6 non-stop runs between Roma and Milano, 9 cities and 12 stations served, 12 million train kilometres per year (Santa, 2013). Since December 2013, Italo services have operated on the Adriatic corridor, linking Ancona to Milano and Torino, competing with Trenitalia on these routes (Bergantino, 2015). In 2012, in its first year of operation, NTV succeeded to provide 38 daily services on the major axis Turino-Milano-Roma-Napoli (Cascetta and Coppola, 2013) and had added approximately 45% to the total HSR supply - Trenitalia provided 89 services on this axis each day. This increase in supply has been sustained. As of early 2016, Italo offered 56 services daily (against 48 in 2015), more frequency on the Rome-Milan and a new service to Brescia opened on 1 March.

Trenitalia has also contributed to this strong HSR supply shock. Its HSR supply has progressively increased since 2009, when Trenitalia started to run high speed services on its upgraded lines. And while the competitor introduced new trains on the densest Italian HSR routes, the incumbent did not reduce its HSR supply. Trenitalia’s HSR services (the “Freccie”) continued (ART, 2015). As a consequence, the on track competition in the Italian HSR market produced a substantial supply growth on the main Italian HSR corridors (Cascetta & Coppola, 2014): in the Milano-Some authors noticed that HSR also serving new stations in Rome and secondary stations in Milano.

Secondly, the HSR competition produced a strong effect on the structure of prices (Bergantino et al., 2015; Cascetta and Coppola, 2013; Mazzola, 2014). Prices started to decrease within a few months of the entrance of the new competitor. Cascetta and Coppola (2014) estimated an average reduction in the price per passenger of about 30% between 2011 and 2012. The main reason is the new pricing structure and availability of promotional offers which has also expanded the “gap” of tariffs, similar to the effect of the introduction of low-cost flights in the air market. This period of price competition and falling prices may now be over. Trenitalia has made up all these tariffs early 2016. They had not been changed since 2011. And the services are now clearly more modern, faster and with more connections and frequencies (F.Q., 2 January 2016).

Thirdly, competition also had significant positive effects on the quality and variety of services. The ancillary services were improved (such as free Wi-Fi, the on-board entertainment and working environment). Up to now, the two operators seemed to compete on the quality of services more than on travel time. The competitive advantage used to be based on the customer satisfaction by the various levels of services and service frequency. Recently, Trenitalia began to introduce new rolling stock (the Frecciarossa 1000 which are the ETR 400 from Bombardier-AnsaldoBreda) able to run in commercial speeds up to 360 km/h. The incumbent wants to make speed and the reduction of travel time a new trade advantage that NTV will find hard to follow for technological reasons (Charlier et Cacozza, 2015).

In conclusion, the entrance of the new competitor contributed to an increase of the consumer surplus by more capacity, more frequency, higher speed, lower prices and more supply from the secondary railway stations, which now have more direct connections in the main Italian transport corridors. This competition also affects intermodal competition.

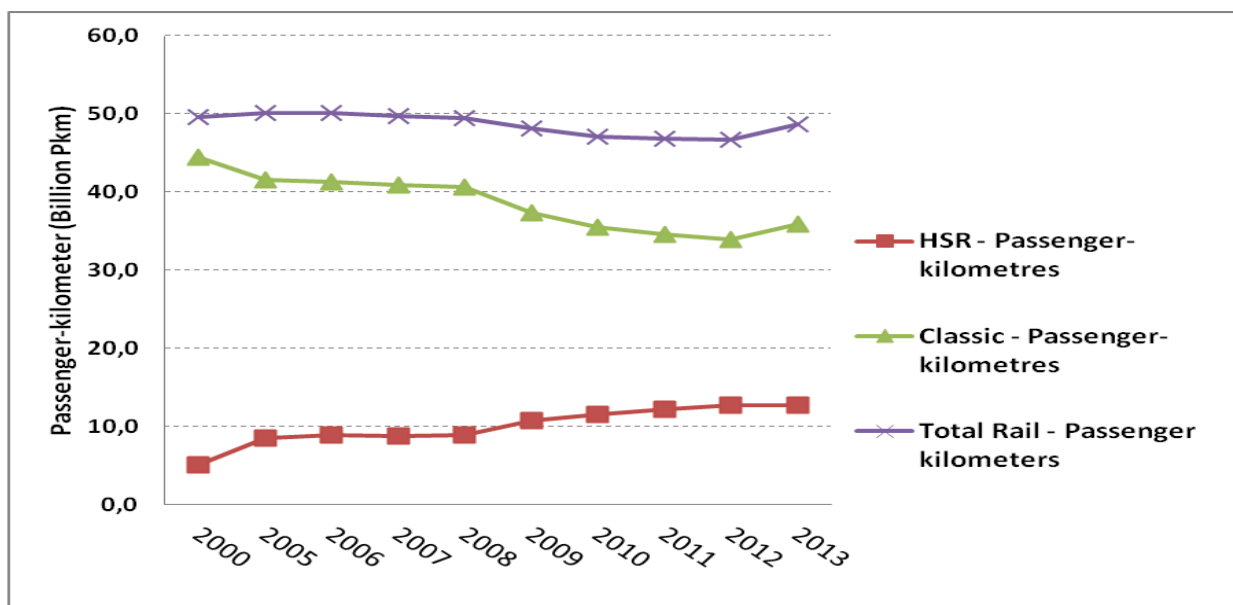
### **An intermodal competition deeply modified in favour of rail**

The entrance of NTV has pushed up HSR’s modal share, particularly on specific corridors, which has strong effect on the whole Italian mobility behaviours.

HSR demand in Italy is in increasing trend, with a major inflection point in 2009 (which corresponds to the completion of the network in its current configuration). The number of HSR passenger-kilometres increased from 8.9 million in 2008 to 10.8 million in 2009, and continued to increase with 12.8 million in 2013 (Figure 1). This HSR traffic growth is over 4 million passenger-kilometres in 4 years – an increase of about 44%. This result is all the more remarkable during the economic crisis, which tends to lead to stagnation or even reduction in mobility (ART, 2015; EC, 2015). The explosion in demand for HSR, in the context of introduction of competition, shows HSR’s capacity to compete successfully with air and road.

At the same time, demand for Trenitalia’s services on conventional lines dropped where it introduced HSR trains, which offset these gains, e.g. on the Milano-Roma line (Bergantino et al., 2015). As such, the rise of HSR has not (yet) in Italy, unlike other European countries, succeeded in increasing the total rail passenger traffic (Figure 1). The number of passenger-kilometres in 2013 was 48.7 million, still below its last peak in 2006 of 50.2 million (EC, 2015).

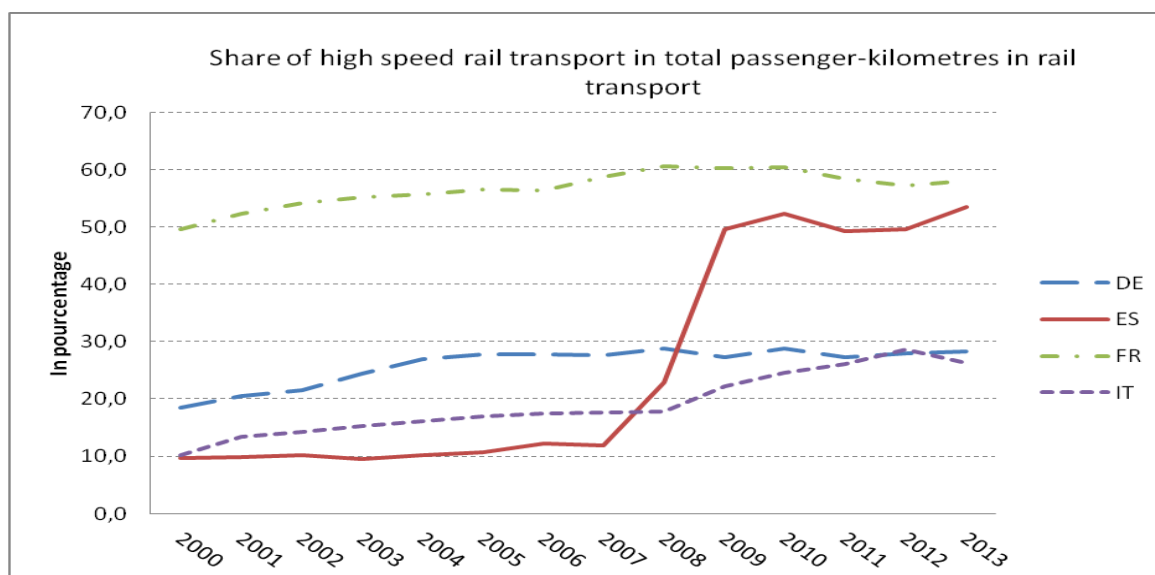
Figure 1. Italian rail transport markets



Source: Adapted from EC (2015). EU Transport in figures 2015.

As a result of this stagnation of total rail passenger traffic in Italy and the rise of the HSR, the share of high speed has particularly increased in the total Italian railway transport. Over the past 10 years the high speed rail share nearly doubled, going from 14.4% to 28.7%, though still below the corresponding shares in Spain and France (Figure 2).

Figure 2. The high speed traffic growth in Europe



Source: Adapted from EC (2015). EU Transport in figures 2015.

Nevertheless, with a low overall progression of the rail, in a global context of reduced mobility, the modal share of rail has improved slightly lately: 5.5% in 2009 and 2010, it increased to 5.7% in 2011 and 6.4% in 2012 – but down to 6.3% in 2013.

However, in some high passenger traffic corridors, HSR was able to fundamentally change the modal split in favour of rail. Evidence from the corridor Roma-Milano shows how the modal shares of air, car and train travel can be deeply influenced by the introduction of HSR. On such routes, air and rail travelling times are now very similar, and the transport modes can be considered as substitutes. From 2008 to 2014, the rail modal share significantly increased, from 36% to 65% (ART, 2015). Passenger on airplanes halved (from 50% to 24%) and travel by car was reduced from 14% to 11%. These trends began before the arrival of the competition, and the arrival of the NTV in 2012 has extended them.

HSR has induced broader changes in mobility beyond modal choice. In the long term, HSR demand is also affected travellers’ lifestyle choices (Croccolo and Violi, 2013). HSR has opened the possibility of commuting further. Higher frequency and connections between the major Italian cities centres, coupled with lower prices as a consequence of competition, can lead to higher attractiveness of HSR commuting. HSR is able to create new possibilities for work-related travel, including return journeys and the creation of ‘macro residential area’ as a result of increased regional integration. It’s the reason why the HSR network and trains in Italy have been dubbed Italy “Italy’s metro” (Croccolo and Violi, 2013)

### A “win-win game”: Positive effects for the entire Italian railway system?

Some commentators have argued that the introduction of competition in HSR has delivered positive effects to the entire railway system (Croccolo and Violi, 2013). There are at least two observations supporting this argument, the first concerning Trenitalia and the second concerning RFI.

Trenitalia continues to obtain good commercial and financial results, even after two years of full competition on HSR. Trenitalia still stayed the major Italian HSR player with a market share around 75%-80%, against 25%-20% for NTV (Table 5). On track competition was accompanied by an increase in the total Italian market of HSR and did not reduce the HSR demand for the incumbent.

Trenitalia’s financial statements show growth in global revenues, including HSR traffic, freight and conventional rail (Table 3). This growth is in particular due to increasing HSR passenger volumes, even though the revenue per passenger decreased because of competition. However, it is not possible to make in-depth analysis as Trenitalia’s financial statement does not disaggregate its revenues and costs by market segment. Moreover, the analysis of Trenitalia income is made particularly difficult because of the detrimental impact of the economic crisis on traffic, both freight and travellers. The aggregate data shows that the company has been drastically reducing its operating costs over the last years, while its operating revenues are stable. According to A. Mazzola (Interview, 2015), the competition was very useful for Trenitalia to reform and trade unions to accept an agreement that brought more versatility, increased working time and therefore productivity gains. The company shows positive and increasing operating profits in recent years. This improvement has made Trenitalia one of the most profitable railways in Europe (Mazzola, 2014).

Table 3. **Trenitalia: Economic and financial performances**

Millions euro	2007	2009	2011	2012	2013	2014	Change 2014/2007 (Million €)	Change since 2007 (%)
Operating revenues	5 521	5 638	5 708	5 498	5 498	5 577	56	+1.0
Operating costs	5 281	4 656	4 317	4 148	4 113	4 121	-1 160	-22.0
<b>Operating profit (EBITDA)</b>	<b>240</b>	<b>982</b>	<b>1 391</b>	<b>1 350</b>	<b>1 385</b>	<b>1 456</b>	<b>1 216</b>	<b>+506.6</b>

Source: Trenitalia, Financial Statements.

Secondly, we observe that the on-track competition produced some positive effects on the infrastructure manager, RFI. Bergantino et al. (2015) report a greater utilisation of the Italian rail network. As a result, we suggest that with the introduction of HSR, RFI benefited from an increase of HSR access charges (toll revenues). RFI’s financial statement supports this assumption, though HSR tolls and conventional lines tolls are not separately identified (Table 4).

Table 4. **RFI: Revenues from sales and services (millions of euros)**

Millions euro	2009	2011	2012	2013	2014	Change since 2009 (Million €)	Change since 2009 (%)
State grants	849.3	975.4	1 110.4	1 050.4	975.6	126.3	+14.9
Tolls (access charges)	903.1	969.5	1 028.6	1 103.2	1 051.2	148.1	+16.4
Electric traction	77.0	79.0	75.0	76.0	93.4	16.4	+21.3
Ferry services	31.8	22.3	20.5	18.1	18.0	-13.8	-43.4
<b>Total</b>	<b>1 861.2</b>	<b>2 046.2</b>	<b>2 234.5</b>	<b>2 247.7</b>	<b>2 138.1</b>	<b>276.9</b>	<b>+14.9</b>

Source: Adapted from RFI, Financial Statement, 2010-2014.

We observe a EUR 148 million increase in total toll revenue over the period 2009-2014. In 2014, toll revenue fell slightly, probably because of Ministerial Decree n.330 (10 September 2013), which reduced by 15% the tolls on the HSR tracks. We don’t know yet the impact of the last ART decision 70/2014 which further significantly reduced HSR tolls. The evidence above suggests that higher traffic volumes on the HSR network could help to compensate for the lower price.

More generally, as suggested by Croccolo and Violi (2013), investment in high-speed rail is also having knock-on effects for the conventional network. The creation of new HSR track frees up capacity on the conventional track for commuting or goods traffic. Where HSR services share the same track as conventional services, the greater speed of HSR also frees up capacity. Moreover, network deployment was accompanied by substantial investment in railway stations and urban hubs, an area in which Italy is a world leader, not least because of the difficulties of crossing historically and culturally important cities. If the investments in new or upgraded lines weigh heavily on Italian taxpayers, they should probably be evaluated in light of the benefits for the communities, which appear to be rather important as suggested by Bergantino et al. (2015).

## Critical factors in the reform success and main risks factors

The positive outcomes of the Italian HSR open access reform are the combined result of positive contextual factors, some physical, others institutional. Further, this newly introduced competition doesn't yet provide strong and undeniable proof that the current gains will be sustained.

### Positive physical factors

The launch of NTV's HSR offer reflects the opportunistic decision to take advantage of several favourable objective factors.



First, geography and demographic characteristics offer Italian HSR strong opportunities. A high proportion of economic activities in Italy are concentrated in the north. In this area, most cities are separated by distances of 150-250 kilometres, which makes HSR competitive against air traffic and car (also, there are congestion problems to approach cities) (Cascetta and Coppola, 2013). This is consistent with Vickerman (1997), who shows that for distances between 200 and 600 kilometres HSR has a clear advantage over air travel. The Milano-Roma corridor (two of Italy’s most populous cities) are separated by just over 500 km. Nash (2015) points out how serving a large population, by example in a string of large cities, is crucial for HSR success.

Secondly, successive Italian governments have invested in the national HSR network – spending around EUR 50 billion to date. Providing and opening up this network, has made the competition possible. In all network industries, the quality and the open access of the infrastructure are among the main conditions for enduring and profitable competition.

The Italian mesh high-speed railway network was substantially completed over the 2006-2009 period (Figure 3). The first link, the “Direttissima“, was partially opened in 1977, connecting Roma and Città Della Pieve (central Italy), while the remainder of route between Roma and Firenze (257 km) was completed in 1992. In the late 2000s, several new lines were successively put into operation: Roma-Napoli and Turin-Novara (2006), Milano-Bologna (2008) and in 2009, Novara-Milano, Florence-Bologna and Napoli-Salerno (UIC, 2014). Some other line extensions are planned or programmed, including Milano-Venice (245 km), which is due to open in approximately 2020. The heart of the HSR (or TAV “Treno Alta Velocità”) network will form a “T”, extending from north to south of the peninsula, connecting Turin to Salerno-Venice with the axis Milano-Roma as the main corridor.

Most of the Italian HSR network can now sustain a maximum speed of 300 km/h, but will likely be improved up to 350 km/h. The Italian Ministry of Transport and the incumbent are currently testing the speed increase of the different segments of the high-speed network in the country. Trenitalia expected the authorization to introduce some direct service between Milano and Roma to the speed of 350 km/h in 2016 (Charlier et Cacoza, 2015).

NTV had directly benefited from a near-complete high-speed network of 923 kilometres. The entire rail network served by large trains is even more important because high-speed trains also run on the conventional rail network, at lower speeds, to maximize the network effect.

Figure 3. Italian High Speed railway network



Source: Mazzola (2014), FSI. Transforum Meeting.

Thirdly, the incumbent Trenitalia HSR offer was still somewhat limited. In 2011, the share of HSR in the total of rail transport, expressed in passengers-kilometre, was 26.2% in Italy (Figure 2), which is relatively undeveloped compared to peers in the EU: 27.4% in Germany, 49.3% in Spain and even 58.5% in France (EC, 2015).

### Institutional positive factors: the major rule of the rail regulator

The new rail regulator, the ART (Autorità di Regolazione dei Trasporti) seeks to promote the high speed rail competition, both by legal decision and also by routine trade-offs.

An important decision has been the large reduction of the HSR network access charges. More precisely, the criteria to be applied by RFI to the determination of charges to be paid by HSR businesses during 2015 led to a reduction of approximately 30% compared to the previous year, from EUR 12.8 train/km to EUR 8.2 train/km. Over the previous decade, the access charges for HSR in Italy averaged EUR 13.4 per train/km against EUR 3.4 per train/km for conventional trains (Arrigo and Di Foggia, 2013; Stanta, 2013).

This decision of the ART confirms the line already taken by the Ministry a year earlier, when a decree reduced HSR rates by 15% (Il Fatto Quotidiano, 5 November 2014). The reduction in tolls acts favourably on the financial balance of railroad companies, because the tolls of infrastructure represent a significant proportion of the costs of the railway operators. By some estimates, this measure should allow NTV to pay only EUR 65 million of tolls in 2015, a saving of EUR 35 million – and for Trenitalia EUR 140 million, a decrease of EUR 80 million (Meillasson and Charlier, 2015). By comparison, this toll saving is similar to the total loss made by NTV in 2014, which was EUR 37 million (Table 6).

As Arrigo and Di Foggia (2013) say, ‘The level and structure of the charges are therefore crucial to establishing competition.’ High access charges limit the potential for profitable entry. It seems to be the case in France, where the access charge is around EUR 18.5 train/km. Conversely, lower track access charges help to promote and to make head-on competition commercially feasible, as we can see in Sweden (Preston, 2012) and now in Italy. In the longer term, the effects of a change of access charges over the entire rail system concerns many stakeholders (Crozet, 2012; ECMT, 2005; Valletti and Estache, 1999), but are still very uncertain.

Some other ‘secondary’ measures taken by the ART (Cambini and Perrotti, 2015) could have long term positive impacts on the level of HSR competition. One of them aims to achieve a higher level of transparency in the operational coordination process and may be conducive to more open minded allocation of scarce capacity. Another measure reduces the flexibility margin from 15 to 10 minutes for requested capacity within peak hours to competitors ‘in the market’. This measure could bring more capacity for HSR. Some other measures concern the performance regime to make the rail service providers more responsible for the delays or train cancellations. The ART also ruled that rail service providers must have a reasonably comparable degree of access to services and facilities at stations for ticketing, advertising and providing information to customers.

By trying to find the best empirical balance between the interests of the all stakeholders, the regulator also contributes to sustaining competition and to obtaining the best possible service quality for travellers with the lowest cost for taxpayers (Croccolo, 2015).

## **Main limitations and risks**

So far, NTV can be considered a qualified commercial success, but it may yet become a financial failure.

NTV has successfully entered the HSR market, even if it took six years between the establishment of NTV and its operations commencing. Moreover, NTV managed to claim a significant market share, around 20% in only two years (ART, 2014). By 2013, the announced target of market share had been reached and it continues to attract new passengers. The year 2015 confirms the positive commercial appeal of the new comer NTV who carries more than 9 million of passengers, an increase of 40% compared with 2014. NTV obtains almost 23% of the Italian HSR market share expressed in volume of passengers (Table 5) and even more (26.4%) when expressed in passengers-kilometres, with 3.98 billion in 2015 (2.76 billion in 2014). It would also have been meaningful to present the NTV occupancy rates results to accurately assess the NTV trade situation, but these data are commercially sensitive so are not publicly available.

Table 5. Italian HSR: NTV and Trenitalia’s market shares

	2011	2012	2013	2014	2015
<b>Passengers (million)</b>					
Trenitalia	23.4	25.1	26.2	29.1	31.2
NTV	0.0	2.0	6.2	6.5	9.1
<b>Share of passengers</b>					
Trenitalia	100%	92.4%	80.9%	81.6%	77.4%
NTV	0.0%	7.6%	19.1%	18.4%	22.7%

Source: ART first Annual Parliament Report (2014, p. 70); EC (2015); Trenitalia; F. Croccolo.

In contrast to the strong market share performance, the financial results have not yet really met expectations (Patuelli, 2015). During the first years, until 2015, all successive operating results are negative and by consequence, all net profits also (Table 6). The year 2015 could be the beginning of the financial success expected by shareholders of NTV. This result has yet to be confirmed. However, the strong growth in revenue and traffic in 2015 are objectively favourable indications. To cope with its debt, NTV’s shareholders, in July 2015, accepted an increase of EUR 100 million capital, with a first tranche of EUR 60 million already released, and approved a new business plan for including reduce operational costs and the continued development of the offer in Italy and even abroad.

Table 6. NTV financial results

Millions euro	2008	2009	2010	2011	2012	2013	2014	2015 (*)	Total
Net revenues	0.2	1.5	4.5	24.7	102.9	249.6	270	308	961.4
Operating Profit	-3.9	-11.9	-21.7	-41.4	-137.2	-77.5	-50.3	58	-285.9
Net Profit	-5.6	-13.2	-20.7	-39.3	-77.1	-77.6	-37	1.8	-268.7
Debts	89	103	104	196	755	782	761	-	-

Source: Adapted from NTV financial statements; (\*) La Repubblica (11 March 2016).

These poor initial financial NTV results seem to be explained. The deep economic crisis of 2008 could not have been forecasted. Its impact had been considerable on the Italian economy and on the overall demand for transport (ART, 2015; EC, 2015). It is difficult to know what NTV financial results would have been without this crisis. There is debate in Italy about the extent to which NTV unsuccessful financial results also depended on management decisions. For example, it is not clear why NTV invested in a maintenance site so far away from the network centre. Perhaps the NTV’s main mistake was to overestimate the extent of the Italian market liberalization. Ponti (2014) argues that the lack of success of NTV is partially due to the incomplete rail competition in Italy. Trenitalia, by operating in all passenger and freight markets, enjoys large and positive economies of scale and scope which represent a substantial economic advantage in competition with newcomers (Stefanato, 2014). NTV has applied unsuccessfully for some time for access to intercity and regional passenger markets (Ponti, 2013, 2014). It remains unclear if the Italian rail regulator will draw a new regulatory framework to open all the segments of the railway market to competition and hence provide additional opportunities to NTV.

Another question is relative the economic sustainability of the head-to-head competition between several companies on the HSR market. Some authors (Preston et al., 1999) suggest that competition on the tracks could lead to duplication of services and to an unprofitable competitive outcome. For now, the observed results do not really support this conjecture. The HSR passenger market seems generally

profitable in Italy, probably even with open access competition. It’s obviously the case for the incumbent Trenitalia. The operational margin of Trenitalia has increased from 20% to 25% since 2009 (ART, 2015), while the share of high-speed in the Italian passenger traffic is increasing sharply. Up until 2015, the financial results for NTV have been mixed at best (Table 6). Clearly it is difficult to compete with a former monopoly that is large and capitalized with public money, in an area where the product is almost identical (Stefanato, 2014). In any case, NTV does not appear to have correctly predicted the Italian rail incumbent’s reactions to the market entry. NTV has probably underestimated Trenitalia’s ability to adapt its services, pricing and operational costs to respond to competitive pressures.

For the FSI, the open access competition raises the crucial issue of public service obligations (PSOs) (Cesarini 2013). If HSR on-track competition results in “cream skimming” of the most profitable rail markets and if new competitors are not requested to contribute to PSOs, it will become very difficult to finance them with the same level of public subsidies. The incumbent will no longer be able to finance these PSOs through cross subsidization, particularly in an Italian context where PSO are already undercompensated. Cesarini (2013) suggests introducing a long-term coherent model of contribution by all rail service providers and/or public financing for PSOs. A co-financing system for universal services should be set up, through royalties on more profitable passenger services.

There is also another debate about the modal competition equilibrium. Is the new modal share between air and rail socially more optimal? At a first level of analysis, we suggest, following Ponti and Erba (2002) that the answer depends on the balance between infrastructure costs and environmental costs. Rail infrastructure is very costly and incremental air travel is less environmental friendly. As rough order of magnitude: a kilometre of high-speed line costs around EUR 15 million while environmental cost for a passenger-kilometre on a plane is less than EUR 0.05. With an HSR demand less than 30 million passenger- kilometres per year, air would be, according to this calculation and assumptions, the better solution. In 2015, the entire HSR Italian market was about 15 million passenger-km (F. Croccolo).

## Conclusions

This study investigated the case of the introduction of a new competitor in the HSR market in Italy, which is so far unique in Europe. This case provides some interesting results for other countries.

1. This open access competition reveals the capacity of the rail industry (including incumbents) to innovate and improve competitiveness. The successful aspects of this Italian HSR on-track competition also provide strong support to the European liberalization railway policy, i.e. the forthcoming Fourth Rail Package. The Italian example supports the case for more competition in the domestic passenger market, especially in unsubsidized services. Until now, competition has only been compulsory in the EU for international passenger lines. It also provides arguments in favour of a more independent network manager. The non-discriminatory access to the rail network, to stations and other facilities appears to be a key to encouraging competition.

2. This new HSR competition brings significant improvements to the overall Italian mobility system, and mainly in rail mobility, in favour of consumers. The greatest advantages are for passengers: more supply and capacity, more frequency and connections, more differentiated services at lower prices

and the possibility to choose between providers. Moreover, the on-track competition had probably produced a ‘win-win’ game between all railway actors. Even if NTV is not yet breaking even, its commercial success in gaining significant market share is non-trivial. In addition, this competition seems to be commercially and financially positive for the incumbent, Trenitalia, pressed to improve its services and to cut the operational costs, and even for the infrastructure manager, RFI, which has gained increased access charge revenue.

3. The success of this new structure market is the result of several positive and specific conditions. The first success condition has been an ambitious and entrepreneurial spirit in the new entrant, who accepted an expensive and risky investment both physically and organizationally and who developed an innovative business model. The second success condition has been the very active and positive role played by the Italian Government to promote this competition. The large public financing of the new HSR dedicated network mainly contributed to make this competition technically feasible in solving the major capacity constraints, even on the busiest routes. The third success condition concerned the positive rules and decisions of the rail regulator. For example, its decision to decrease the level of access charges significantly appears to have enlarged the scope for profitable entry and to make more sustainable the investment of the new comer. The fourth success condition is the capacity of the incumbent to improve its own services and to react to the competitive pressure.

4. The specific factors of the Italian situation suggest some caution in directly applying the lessons to forecasting open access impacts and regulation patterns in others European countries. Nevertheless, some meaningful ideas can be drawn from the analysis of the advantages and disadvantages of this new HSR open access regime. In this sense, we hope that this Italian case contribute will contribute to “better practice” for OECD member countries.

Furthermore, we are conscious that this study is based on a too short period and that the results are also impacted by the adverse consequences of the present European wide economic crisis. Further research will be needed to bring out more mature conclusions.

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**International Transport Forum**

2 rue André Pascal  
F-75775 Paris Cedex 16  
[contact@itf-oecd.org](mailto:contact@itf-oecd.org)  
[www.itf-oecd.org](http://www.itf-oecd.org)

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