

Stimulating European rail freight transport: towards a new governance approach

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Abstract

Developing rail freight sector in the EU is desirable from both a political-social point of view and from a market business point of view. Fragmentation in the national railway systems impedes, in many ways, social and economic benefits in the liberalised EU railway market. The need for innovative governance to deal with the fragmentation problems is therefore pressing. This paper sets out an innovative governance framework – MCC for the governing of the European rail freight domain. MCC is problem-driven, market-oriented and corridor-based. It puts the lens on the forming of horizontal transnational collaboration next to and in relation to the existing vertically-structured institutional arrangement. The design of the framework is based on multidisciplinary approach, where theories like multi-level governance, supply chain management, and geographic concepts such as corridors and networks are integrated. This governance framework is then employed to preliminary assess the existing governance practices such as policy guidelines and directives, as well as emergent governance developments such as transport corridors developed from both business and research projects. Three types of governance practices are derived from the assessment – legislative governance, corridor governance and MCC governance. The results contribute to a better policy making to accelerate the growth in the EU rail freight industry and the advancement of strategic management, spatial planning and organisation theory.

1. Introduction

Within the European Union (EU), there has been a dynamic expansion in the overall freight transport market over the last past thirty years. Nevertheless, the growth in rail freight transport sector is disparate. The transported volumes are modest compared to the competing modes of transport – in particular road transport, the market share steadily declines, and the service performance suffers from long lead time and low reliability. As a consequence, the customers such as shippers and logistics service providers are not fully convinced of the benefits of using railway services, and the train service providers including railway undertakings and rail freight operators experience difficulties in acquiring new freight contracts.

Since the establishment of the European Community Single Market in 1993, the pace of political, legal and economic changes in the EU has been accelerated towards a free movement of goods, labour, service and capital throughout the EU, which was stipulated in Article 28 – 30 of the EC Treaty (EC, 2001a). This fundamental European integration has significantly affected the rail freight sector. For decades, the rail freight sector, which has been regarded and structured as a solely national economical interest, is now obliged to open up to competition in a broader European arena. Since January 2007, the legal condition has been established for its opening to the EU market (EC, 2004). This legal act offers transport industries and business actors in the national states accesses to more business opportunities in a wider market, and consequently it stimulates greater competition for improved services performance and lower transport costs.

The traditional fragmentation in the railway sector, artefact of the past state-based organisation of infrastructure and services, is, however, still a considerable problem and is recognised as being responsible for the slow progress of the realisation of an integrated European rail freight system. This fragmentation is taking place in different parts of the rail freight system, including technical, operational, organisational, and institutional aspects. For example, the European regulations ruling the rail freight market vary across the national states both in terms of the aspects involved and the degrees of impact (TDIE, 2005). Another example concerns the discrepancies in the signalling systems, the gauges and the electrifications across the national states, resulting in a

lack of interoperability between the national railway systems (e.g. Nijkamp, 1995; Walker, et al., 2007).

To deal with the various aspects of fragmentation in the European railway system, the scope and depth of policy guidelines and legal actions at the European level have increased considerably. For example, The White Paper European Transport Policy for 2010: Time to Decide, set out by the EC (EC, 2001), is one of the most influential policy guideline, in which some 60 measures have been proposed to improve the European transport system including the rail transport sector. Besides, in the TEN-T programme (Trans-European Transport Networks) (i.e. EC, 1996; 2001; 2004), which deals with the layout and the financing of EU transport infrastructure projects, one third of the projects being railway projects. In addition, the ERTMS Directive (European Rail Traffic Management System) (EC, 2008) aims at the standardisation of various national railway operational systems. Furthermore, the First Railway Packages (EC, 2001; 2001; 2001) and the Second Railway Packages (EC, 2004; 2004; 2004) intend to further open up the European rail freight market step-wise.

During recent processes of making and implementing the above described policies, new governance practices have emerged next to the existing traditional ones. The sum of these governance developments entails different principles. Some are based on strong vertical relationships between the territorially bounded governments, i.e. the EU policy makers and the national governments. Others assume horizontal linkages between the state governments, the intergovernmental agencies, and between the state governments and the private parties.

Despite the considerable policy efforts and the diverse governance practices, it is acknowledged that fragmentation in the European rail freight system has, so far, not been reduced sufficiently (EC, 2007). Some researchers hold views that the general freight transport sector in the EU has not been well regulated and question the suitability of the traditional institutional arrangement to address the rail and intermodality challenges in the EU (e.g. ENO, 1998; Power, 1998; Greenwood, 2002; Vibert, 2002; Walker, et al., 2004). In addition to criticism, researchers call for innovation in the governance structure for developing rail freight transport in Europe (Walker, van Grol et

al., 2004; EC, 2006; 2006). From these studies the need to examine the present governance approaches and their effectiveness is clear.

In light of the above, the objective of this paper is twofold. First, it is to design a conceptual framework of governance for effectively steering the European rail freight industry. This framework is labelled as the MCC (Market-Corridor-Collaboration) framework. Second, it is to take stock of the various governance developments and to use the MCC framework for assessing the present governance practices. The main questions addressed are: On what base is the MCC governance framework being formulated? How is this governance framework used to assess the traditional and emergent governance developments in the EU rail freight sector? In what way do these governance practices differ from one another? To design the governance framework a multidisciplinary approach is used. In particular, the theory of multi-level governance and several geographic disciplines such as corridors and networks are employed.

The next section we explore the school of institutional economics theory. Section 3 elaborates on essential elements of the multi-level governance theory. This is followed, in Section 4, by a review on spatial concepts, corridors and networks. In Section 5, we integrate these disciplines and apply them for the design of conceptual framework of governance, which is tailored to the European rail freight sector. This framework is employed in Section 6 to assess the different types of governance developments present currently in the rail freight domain. Section 7 summarise the conclusions and offers issues for further discussion.

1.5 Institutional economics theory

In this study the Williamson's schema (Williamson, 2000) is considered as a valid guidance for choosing particular theories for application in practice. As Figure 2-1 shows, Williamson (2000) categorises the mainstream institutional economic theories into four distinguishing layers: (1) social theory; (2) economics of property rights/positive political theory; (3) transaction cost economics and (4) neoclassical economics/agency theory.

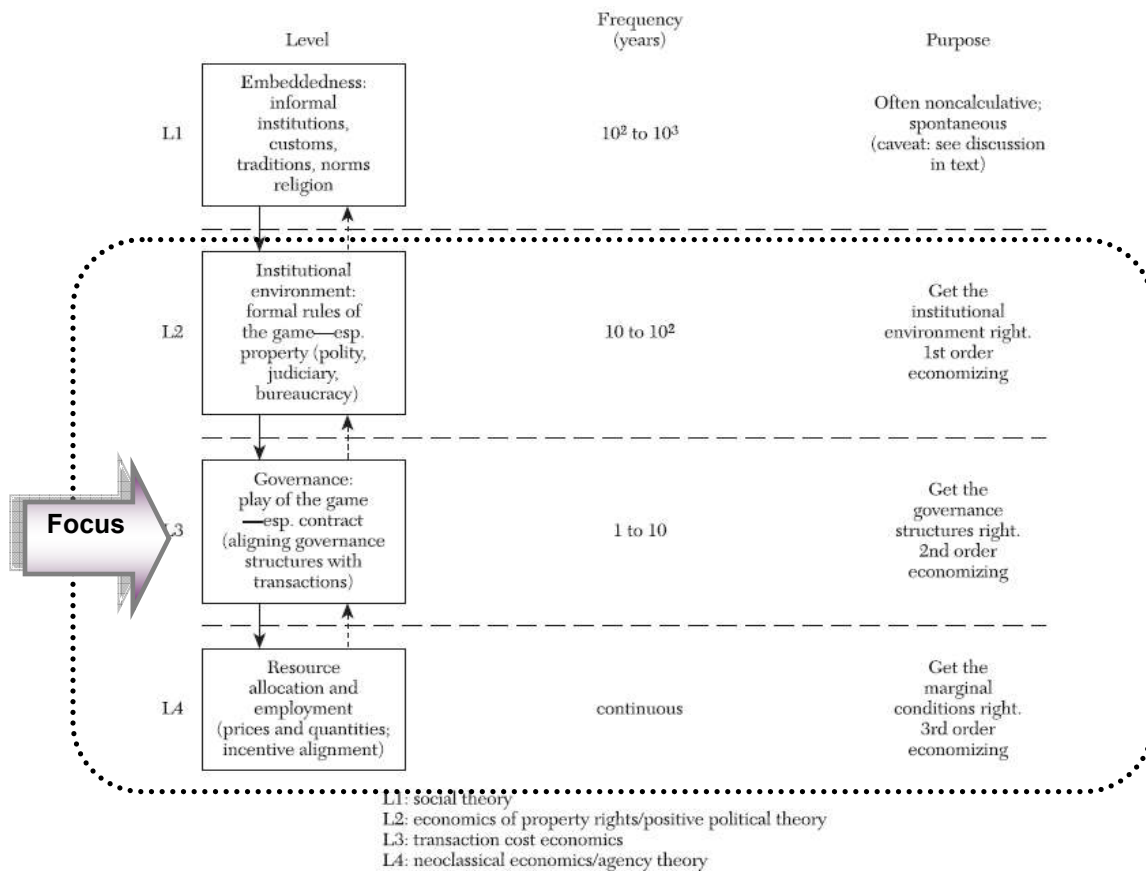


Figure 2-1 Four layers of economics of institutions (Williamson, 2000)

The top layer is the level of social embeddedness. This is where the norms, customs, morals, traditions, etc. are located. This is also termed by North (1990) as the informal constraints. Although institutions at this layer change very slowly on the order of centuries or millennia, it gives a pervasive influence upon the long run character of economies. Since the concept of embeddedness is still in need of greater theoretical specification and explication, this layer of institution has so far been taken as given by most institutional economists.

The second layer is referred to as the institutional environment. This is also termed by North (1990) as the formal rules, constitutions, laws, and so on. A strong assumption of this layer is that the market itself cannot function properly unless formal institutions are introduced. The legal system will eliminate market chaos by defining and enforcing laws (Coase, 1959). The weakness of this assumption is, however, that it presumes that the definition and implementation of laws is costless. Thus, going beyond 'the rules of the game' to include 'the play of the game' is necessary.

'The play of the game' is realised in the third layer, where the tasks to define and implement the formal rules in order to build a functioning legal system are followed up. This layer involves the institutions of governance and transaction costs. The institutions of governance deal with the governance of (contractual) relations between the involved parties and set the rules for the governance. The unit of transaction contains three principles: conflict, mutuality and order. And governance is an effort to mitigate conflict, realise mutual gains, and craft order within the transaction process (Commons, 1932).

The fourth layer deals with the discrete structural analysis of governance. That is the level, at which neoclassical analysis works. Optimality apparatus, marginal analysis are employed. Firm is typically described as a production function. Agency theory, which emphasises ex-ante incentive alignment and efficient risk bearing, rather than ex-post governance, nonetheless makes the provision for non-neoclassical complications, of which multi-tasking is one (Holmstrom and Milgrom, 1991).

Based on the nature of the problem in the rail freight domain, the various disciplines we select for designing the governance framework are embedded, in the Williamson's schema, between the second layer, the formal institution, and the fourth layer, the market, while paying explicit attention to the third layer, the governance.

2. Multi-level governance

Studies on regional integration and governance practice are of increasing interests to scholars in institutional and organisational economics. With regard to the extensive and diverse body of multi-level governance, Hooghe and Marks (2001) categorises them into two types. The core claim of Type I multi-level governance model is that state is the 'container' of economic, social and cultural policies. Amongst various formal political institutions, states are the ultimate policy makers. The level of sovereign state is regarded as primary (Giddens, 1985; Taylor, 1991; Caporaso, 1996; Taylor, 1997). Moreover, state is a key actor of international politics. In a joint decision making process, states or national governments ground their negotiating positions on their respective domestic political interests. The existence of supra- and sub- national governments and the dispersion of authority among them is to serve the ultimate economic and social interests of the states. Sub- or supra- national economies were considered as the sub-

units of the national economy. And the differences between these sub-units were regarded as relatively less important (Jessop, 2002; Gualini, 2006).

Type I multi-level governance accounts for a strong position in Europe for two main reasons. The first one is related to the issue of path dependence. Type I governance has been established for a long time in Europe. The vertically structured institutional system and the defined territorial and jurisdictional boundaries, once established, are rooted in the constitution, and they remain for decades to pursue political stability. This governance practices possesses enormous political and legislative power. Fundamental institutional reform is rare, and even it ever takes place, the transaction costs would be considerable since it threatens the existing institutional structure with regard to their scopes, competences and even their survival (Hooghe, 2001). The second reason concerns the territorial identity, which expresses an intrinsic sense of belonging to a particular group rather than a preference across some set of policies. The fact that national states support or deter particular European integration policies is, to certain extent, led by the respective TAN values of the state – Traditionalism, Authoritarianism and Nationalism (Hooghe, et al., 2001). The recognition of the role territory identity plays in the decision making process challenges the school of neoclassical economics and rational choice theory, which are based on assumptions of utility maximisation and rational preference. To sum up, type I multi-level governance model entails the following six primary elements:

(1) Each of the pre-existing and sub-central governments exercises their authorities by carrying out multiple tasks. Norton (1991) said “..... a wide spread of functions reflects the concept of general-purpose local authorities exercise comprehensive care for their communities”.

(2) Authorities at particular governance level are territorially bounded and are mutually exclusive from each other. This can be applied when policy making in the state is relevant only for the interests of the state, and apply only within the national territory. As such, the jurisdictional boundaries of the states are regarded as non-overlapping.

(3) The number of governance levels is usually limited. Authorities are vertically, neatly defined by local, regional, national, European, and international levels.

(4) The number of authorities at a particular governance level is limited. To gain efficiency, authorities are integrated to the extent that it is sufficient to carry out the multiple tasks. In the case of governance in rail freight sector in the Netherlands, the involved national governments consist of the Prime Minister and the Ministry of transport and water management.

(5) Once the political system is established, the institutional structures defined by the system are likely to survive for a long period of time. This is because adjusting institutional structure horizontally and vertically is rare, and radical reform, such as abolishing the existing or creating new institutions, is costly.

(6) The dominant relation between the institutions appears to be vertical. Governance efficiency is gained through the coordination between the hierarchically connected political organisations (Gualini, 2006).

To the contrary, Type II multi-level governance model focuses on the dispersion of authority and the balance of decision making power away from the national governments. Although it accepts the view that states remain as an important unit of analysis, it differs with Type I governance by three distinct points of view. First, the decisions are made not only between the national governments, but also across multiple levels of governance, for example between national and supranational policy makers. Second, individual states gradually lose their power in a joint decision making process. And these joint decisions being enforced involve both gains and losses for the individual states. Third, states no longer provide the sole interface between supra-national and subnational arenas. Domestic politics extend to the supranational level and subnational actors may operate in both national and supranational arenas.

The change from Type I to Type II governance: Since the 1940's, Europe has been experiencing a number of political and economic transformations. The most significant ones are the transition from the manufacturing and industry economy to the service and knowledge economy, the shifting of industry from west to east, the extension of capital movements, the forming of the European Community (EC), and the ongoing process of European internal market. This globalisation and European integration process highlights the relationship between the spatial configuration of economy and the economic processes. The spatial configuration of economy has shifted from state-wide

territory upwards to European-wide territory or global-wide territory on the one hand; and downwards to regions on the other hand. In the meantime, the existing Type I governance practice began to experience difficulties in responding to the changing economy. This phenomenon is termed by Gualini (2006) as 'institutional misfit'. To remove the 'institutional misfit', there is a need for a renewed governance structure with its spatial dimension corresponding to that of the changing economic process. This seems to imply a shift of decision making power and competences away from the national state, the transition from Type I governance to Type II governance.

The nature of the emergent spatial governance structures entails the following three perspectives Gualini (2006). They mainly suggest that under the renewed governance, national state will remain as always, but the approach a state governs the society and the varied market sectors will change, for example by the shifting of authorities to the European or regional governments, or by public-private-partnership. Besides, the importance of scaling is emphasised as a key dimension to both economic process and governance approach.

1. *"The shift 'from government to governance' in public policy is not equal ... to a demise of the state. Governance practices redefine the ways the state intervenes ... in realising new forms of socio-political regulation at the threshold between the public and the private, between the economic and the non-economic.*
2. *Territoriality still plays an important role in this process, albeit in new spatial forms and according to new political-institutional rationales. Hence, processes of de- and re-territorialisation constitute a key dimension for the analysis of patterns state agency in relationship to markets..., and for assessing their effectiveness and legitimacy.*
3. *The spatial domains of governance practices cannot be taken for granted ... since scales of socialspatial activates are being redefined throughout the domains of economy, politics and culture. ... "*

Hooghe and Marks (2001) classifies a number of circumstances where Type II governance prevails. First, it can be found at frontiers between the public and the private.

Typical examples are the replacement of public ownership by private ownership, or the transfer of public management task to private firm through long-term concession. In the latter case, although national government remains ultimately accountable for the service quality, the private firm exercises sizeable autonomy in executing the management tasks. Second, Type II governance is present at the national and international frontiers, often coordinating the engaged actors in a specific trans-national policy problem. Third, Type II governance may also be found at regions of the bordering states in order to coordinate the actors to solve the border issues. On the whole, Type II governance contains the following six primary elements.

(1) The policy makers are independent and they fulfil distinct functions.

(2) The institutions may be territorially structured, but the exercises of their authority are not necessary bounded within the territory. Once borders are crossed or the boundaries are met, jurisdictions overlap with one another in order to deal with the problem.

(3) The governance structure is organised across a great number of levels.

(4) The number of authorities at a particular level tends to be greater, since the dealings between territorially bounded institutions face problems and this may give rise to a need for new institution that governs cross the territory boundaries.

(5) The setting of institutions tends to be flexible, since the institutions are established or organised to respond to the functional requirements. They continue when needed and be dissolved when problems are solved or demand no longer exists.

(6) The scalar dimension of the institutional system is horizontally organised Gualini (2006). Governance often takes place horizontally between these institutions.

Below Table 2-1 summarises the key distinctions between the above two types of multi-level governance models.

| | Type I multi-level governance | Type II multi-level governance |
|-------------------------------------------------------------|--------------------------------------------|--------------------------------|
| 1. Tasks carried out by institutions | Multiple tasks | Specific tasks |
| 2. Territorial boundaries of institutions | Mutually exclusive at any particular level | Overlapping at all levels |
| 3. Number of institutional levels (vertical) | Limited | No limit |
| 4. Number of institutions at certain level (horizontal) | Limited | No limit |
| 5. Degree of stability of institutional structure | Fixed | Flexible |
| 6. Dominant coordination structuration between institutions | Vertical | Horizontal |

Table 2-1 Key distinctions between two types of multi-level governance models (based on Hooghe (2001), Hooghe and Marks (2003), and Gualini (2006)).

3. Corridors and networks

As seen in the previous section, debate on geographical concepts such as scale and territory forms part of the governance and institutional study. This leads to a question with regard to the relevance of scaling for governance. This question is answered in two lines of thinking. First, and foremost, in order to make it legitimate and effective, theorising scale is essential for constructing the scope and framing the spatial boundary of policy making and policy implementation in the rail freight sector. Second, analysis on scale is used to study its implication on the power dispersion shifting away from the national state (Gualini, 2006). In this research, we consider the unit of scale as an inherent dimension of governance, and governance in the transport sector as one playing field where theorising scale can be exercised.

As is shown, the economic process in Europe has undergone an evolution from nationalisation to Europeanisation. Thus, in order to design legitimate and effective governance in the domain of railway transport in Europe, it is felt necessary to first grasp the scaling phenomenon in the evolving European transport market. In Section 3.4 we then examine several geographical concepts that have been employed in transportation planning, urban design and supply chain logistics. We place our emphasis on the

concepts of corridor, network, gateway and hub because these concepts play a crucial role in the current transportation planning.

The concept of corridor is not new. The use of it as a planning concept dates back to as early as 1882 when the Spanish urban planner Arturo Soria y Mata (1844-1920) published a series of articles for his design of a linear urban model fully tailored to the development of transportation infrastructure in order to improve the transport efficiency. Based on his line of thinking, a district in Madrid was linearly divided into nine areas. The district is termed as 'The Linear City' ('Ciudad Lineal' in Spanish). Although such a model is questioned from the social point of view by professionals, the corridor concept has remained and has formed part of the ongoing debate on patterns of urbanisation and urban spatial structure.

Nowadays, the concept of corridor can be adopted in a broader interpretation that encompasses areas such as telecommunications, energy supply, transportation services, regional cohesion, organisational structure, and so forth. Its use is still more common with regard to its implication for transportation and urbanisation. In general, corridor is perceived as an accumulation of flows and infrastructures as dynamic entities linking economic, infrastructural and technological processes (Rodrigue, 2004). In the recent years, three types of corridors are identified, transport corridor, freight transport corridors and the eurocorridor.

Transport corridor is defined as bundles of infrastructure that link two or more urban areas, eg. highways (sometimes via different routes), rail links (high-speed trains, intercity lines, local trains or trams), separate bus lanes, cycle paths, canals, short-sea connections and air connections. The development of transport corridors involves using different modes of transport and carrying both passenger and freight transport (Priemus and Zonneveld, 2003).

Freight transport corridors, or freight corridors, are corridors with linear orientation of freight flows supported by accumulations of transport infrastructures and activities servicing these flows together with a set of articulation points (eg. terminals or distribution centres), illustrated in Figure 3-1. Flows on freight corridors tend to split by mode since each transport mode tries to exploit its own advantages in terms of cost,

efficiency, reliability and so on. More recently, as congestion has risen on road corridors and as reductions in environmental pollution and improvements in transport performance have been sought within the supply chains, model complementarity improved. Today freight corridors represent a setting where integrated transport systems through intermodality or comodality are used as a particular concept to improve the mobility of freight in various freight corridors.

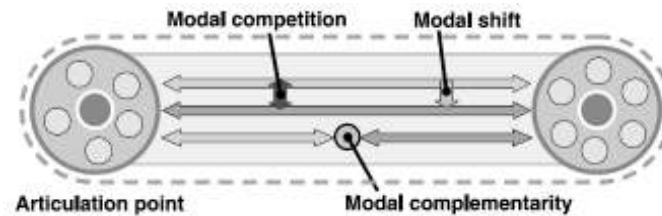


Figure 3-1 Freight corridor and model integration (Rodrigue, 2004)

Depending on the spatial levels being considered, a freight corridor may appear very different. It may connect two continents across the ocean, two distribution centres within one continent, or just two terminals within one country. Decisions on geographical constraints of the freight flows at these scales (i.e. within country, within continent or global) are mostly derived from strategic considerations. Operational considerations, such as choices of the terminals, the routes, and modes of transport to be used, determine the layout of the freight corridor.

Rodrigue (2004) has classified freight transport corridors into three paradigms according to their distinctive functions (see Figure 3-2). In Paradigm A, cities are structurally independent entities and are the main unit of analysis. Transportation is only for market accessibility of the cities. In Paradigm B, transportation serves not only for market access but also for territorial specialisation, interdependence between the urban areas, and the realisation of economies of scale for the market. In Paradigm C, emphasis on transport corridors are three-folded. First, the freight flow implies the logistical management of complex distribution system. Where are the goods produced and consumed and where are the origin, destination and the intermediate stops? Second, the functioning of the articulation points: what is the capacity of the terminal; does this terminal serve as a hub or a gateway? (See Table 3-3 for the difference between hub and gateway). The third aspect concerns the capacity of infrastructures where articulation points are interlinked and where transport operations are carried out.

In the development of a rail freight corridor, its physical planning and construction tends to remain steady and stable by time. It often takes the shape of improving existing rail lines or building new rail lines next to or in the vicinity of the existing ones. Whebell's theory on corridor explains this phenomenon as being strongly path dependent (Priemus and Zonneveld, 2003). Constructing rail lines is large infrastructure project. The efforts dedicated, and the time spent are considerable. The sunk costs and fixed costs incurred are huge. Once the rail lines are built, they will have significant economic and societal implications, such that the chance for re-construction or demolition is small. Therefore the planning and construction of rail infrastructure are usually an initiative of some institutional drive and they usually evolve slowly along the historical track.

Railway corridor in terms of its infrastructure planning and construction is path dependent and static. Nevertheless, in the sense of freight integration activities, transport service organisation, and operational planning, railway corridor is dynamic and varied. Similarly, the degree of stability for gateways of corridors (eg. ports) is high because of the large sunk cost (Rodrigue, 2004). While hubs (eg. terminal for hub and spook operation) are less stable as they depend on the business plan and the economic process. A terminal may lose its function as a hub when the service operation becomes economically unviable (Kreutzberger, 2008).

Among all three paradigms, Paradigm C appear to be most relevant for our study because it provides transport corridors at regional level with implications of the supply chain system and economic process that take place at the national or international level. It thus offers a theoretical foundation to scale the analysis of governance on freight corridors at lower spatial level up to a higher spatial level, for example, from within state level to inter-state or European level.

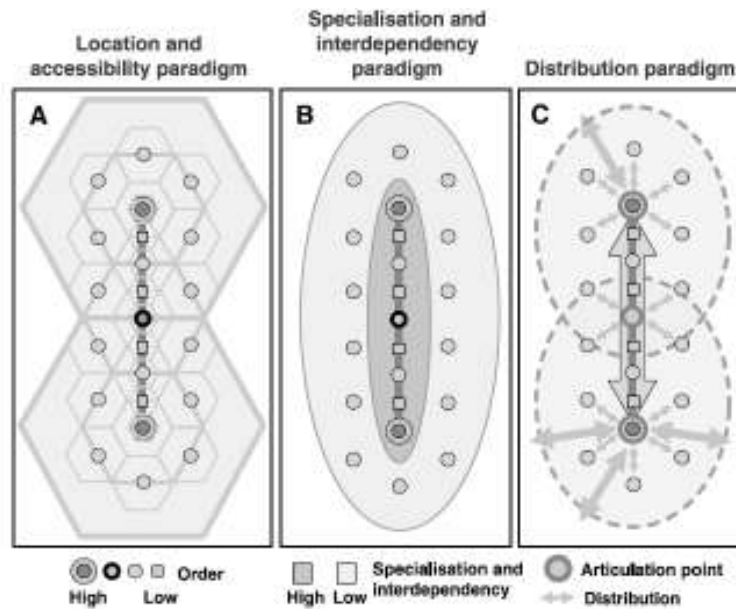


Figure 3-2 Paradigms in the representation of freight transport corridors (based on Rodrigue (2004))

| | Gateway | Hub |
|-------------------------------------------------------------------------------------------|------------------------------------------------------------------------------------|--------------------------------------------------------------------------|
| Logistics services | Distribution centres, warehouses, but also insurance, finance, customs declaration | Distribution centres, warehouses, |
| Terminal services | transshipment, loading and unloading | transshipment, loading and unloading |
| Intermodal operation (between different modes) or trans-model operation (within one mode) | Often intermodal operation eg. short sea shipping to rail; rail to road | Often trans-model operation eg. hub-and-spook system, from rail to rail. |
| Entrance/Exit of freight to another region | Often to another country or continent | Often to another region |
| Interface between spatial systems with different institutional settings | Yes | No |
| Degree of stability by time | Stable | Less stable |

Table 3-3 Distinctions between gateways and hubs (based on Rodrigue (2004) and van Klink and Van den Berg (1998))

A different but related concept to freight corridor is the eurocorridor. Eurocorridor is defined as a combination of one or more important infrastructure axes with heavy flows of cross-border traffic linking important urban areas (EC, 1996). It is seen as a bundle of infrastructure and is referred to often in the context of spatial development relevant for European cohesion discourse and economic integration. The concept of eurocorridor has been hinted as early as in the project 'Europe 1992', led by the EC during period 1985 to 1992. This project aimed at a Europe without borders. The key assumption was

that the abolition of the barriers posed by the national borders would result in a substantial rise in cross-border relations and transnational relations, which could ultimately reshape the spatial structure and thus the map of Europe in a significant way. Besides, new cross-border and transnational infrastructure could offset peripherality and make the economic integration physically possible. The economic integration encouraged by this project should be accompanied by a policy programme aimed at the physical integration of the European territory.

A second significant demonstration of eurocorridor in transportation is the Trans-European Transport Networks (TEN-T), in which, up to the time of writing, 30 priority eurocorridor have been identified where interconnectivity between national transportation infrastructures, and interoperability between the traffic management systems of these infrastructures are to be improved.

A third example of eurocorridor is the Noordwijk- and Glasgow-versions of the European Spatial Development Perspective (ESDP), which explicitly advocates the development of eurocorridors as an important element of a European spatial development agenda (EC, 1997) (British Presidency, 1998). When this approach was toned down in its application in the sector of spatial planning and transport, a problem emerged concerning the identification of specific corridor. Since eurocorridor entails different spatial scale, it did not fit neatly into the national spatial planning policies. As a consequence, agreements were difficult to reach between the states in terms of which areas were designated as eurocorridors and which not. This problem again picks up the discussion with regard to the dilemma between the different but co-existing spatial scales in relation to governance and transportation planning, and it also emphasises the institutional fragmentation in areas where there are strong links between the constituent parts.

Supply chain network is another concept that closely related to freight corridor. Hagdorn (2007) has renewed our perception of the supply chain network. She explains a shift in thinking from a supply chain perspective to a network perspective. The supply chain network contains itself not only in its tangible or physical dimension such as the layout of infrastructure and the moving of goods and supply chain activities between one end and the other, it also contains an intangible or abstract dimension, such as the information

network, customs network and service network which are associated with the physical networks.

This holds true in the rail freight market in Europe. For example, before a German rail undertaking operates its transport services from Germany to Hungary, it needs to apply for required legal documents (eg. safety certificates, liability insurances) and train paths via each corridor states. This network practice entails both physical and abstract implications. On this network, exchanges of documents and information, interactions and collaborations between the public and the private take place, on nodes (eg. terminals, ports) and links, and between bordering states (eg. Germany and Austria) and non-bordering states (eg. Germany and Hungary). Besides, this network-like mode of interaction implies an inter-governmental and inter-firm mobilisation between the states.

4. Governing the European rail freight sector – the MCC framework

Governance in the domain of European rail freight sector has long been dominated by a form where policy making and implementation are territorially bounded and hierarchically structured. The EU railway sector has been regarded and structured by an aggregation of solely national economic interest. Once the EU regulations and directives are set up, they are individually transposed by the national governments into national decrees and measures, and separately implemented in the states. The decision making power is shared between the EU and the 27 member states, and the political interactions take place between the EU and the states, and within the state.

In the meantime, the different implications of a particular rail freight service at different spatial scales and the interactions between stakeholders at different levels have come to be recognised. For example the construction of the Betuwe route, a dedicate rail freight line connecting the port of Rotterdam in the Netherlands to the German border, is engaged by stakeholders at both national and the EU levels. The Netherlands favours the Betuwe route as it supports the development of port of Rotterdam and the growth of the domestic rail freight traffic. Germany has hesitated to collaborate with regard to the extension of the rail line to its Ruhr industrial region as this would increase the risk of drawing freight volumes away from the its own port of Hamburg but to the port of the neighbour. At the EU level, the EU policy makers are interested in the Betuwe route in

that it is seen as a backbone to transport goods to the European hinterland in a sustainable manner.

Another example is the TEN-T programme. Participating TEN-T programme is considered by many national states as a means to acquire additional EU funding for domestic infrastructure construction and modernisation. However, the TEN-T corridors proposed by the states are selected based partially on the EU-goal towards European integration and European cohesion. One criterion is that the wide coverage all member states, linking the periphery areas and the economic areas. In this respect, the social interest at the EU level is not shared by the economic interest at the national level. This has led to certain gains and losses of the individual state during the process of TEN-T infrastructure projects selection.

Fragmentation in railways has come to the surface under the support for an integrated intra-European rail freight system in pursue of European integration and cohesion. This highlights that the socialspatial configuration of the EU railway economy is evolving from state-wide to EU-wide. It also highlights that the traditional governance in the rail sector is not capable of responding to the changing railway economy, and is ineffective in dealing with the fragmentation barriers. The key concern is the mismatch between the socialspatial configuration of transport economy and that of the governance, in that the problem in the rail freight sector – fragmentation, is horizontal and transnational, whereas the governance in freight is vertical and hierarchical. If governance is only effective when gears its scalar dimension to that of the economic process, then a change in the existing governance structure in rail sector towards horizontality is necessary.

The discussion above leads to the next question: In which way do these theories contribute to a type of governance tailored to the European rail freight sector, and what would such governance look like? This question is answered by the conceptual governance framework illustrated in Figure 4-1. This framework is called: MCC governance framework. It is designed by means of combining and integrating concepts and theories in the previous sectors. In MCC, governance is defined by three core inter-dependent structural elements – market, corridor and transnational collaboration.

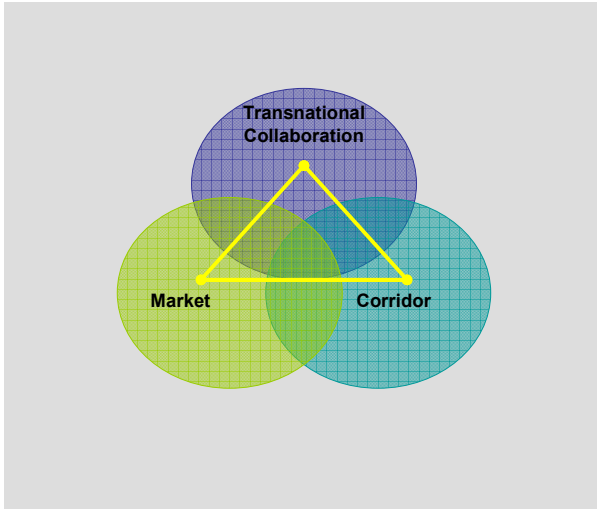


Figure 4-1 MCC - conceptual governance framework

With regard to the first MCC element, market, three implications are drawn. (1) Market is the core of all matters involved in this subject; it relates to both the cause of and the solution for the fragmentation barriers in the EU railway sector. The inconsistency between national railway systems becomes acute due to the dynamics and changes in the railway market. Therefore, policy strategies identified to tackle fragmentation cannot be effective without taking rail market development into account. (2) Market coupled with the second MCC element, corridor. Transport corridors are of great interest when they link areas of (potential) economic interests, regions with emerging industries, or states with high trade flows. (3) Market is associated with the third MCC element, transnational collaboration, as the transnational collaboration implies interactions between a number of stakeholders, who steer and/or take part in the transnational railway market.

The second MCC element, transnational collaboration, implies interactions beyond the national scale. It is explained along three tracks. (1) Transnational collaboration refers to the dispersion of authority among the key actors during process of governance in areas like policy making, implementation and monitoring, cooperation. This dispersion goes both horizontal and vertical. Horizontally, authority may be shared between the national governments, and between national governments and the market players. Vertically, authority may be shared between the European policy makers and the state public and private actors. (2) The stakeholders involved in governance are not bounded by the traditional territorial and institutional settings. They are usually characterised by their functions and abilities to solve the fragmentation in the EU railway system. They are

independent, problem-driven, task-specific. (3) Although national governments remain important stakeholders, the roles of the EU governments, the transnational agencies, and the private parties are becoming increasingly important in the rail freight domain.

The third MCC element, corridor, is explained by six distinct viewpoints. (1) Corridor approach defines the scope of governance in the rail freight domain. Instead of being exercised in all 27 member states and all at once, governance is accomplished in a corridor-wise manner. An integrated EU rail freight sector is likely to be achieved by good coordination of many well-governed EU rail freight corridors. (2) Corridor approach is associated with MCC element, transnational collaboration. It implies collaboration beyond the national boundary, and across a number of states that are engaged in the rail freight corridor. It also suggests multilateralism rather than bilateralism. For example, the cross-acceptance of legal documents, or harmonisation of technical specifications is thus done not only between the neighbouring countries, but also between or among any corridor-engaged states. (3) With corridor approach, all aspects of rail fragmentation are centralised and tackled on the corridor. In particular, on one and the same corridor, not only tangible fragmentation such as rail infrastructures, technical and operational obstacles, but also intangible fragmentation such as administrative and institutional barriers is tackled. This approach is likely to be more effectively in dealing with fragmentation. In such a way, rail developments in the corridor-states are likely to take place more rapidly. (4) Corridor approach implies the shifting of socialspatial dimension of governance from the traditional national scale towards dynamic trans- and supra-national scale, with the emphasis on the horizontal linkages. (5) It should be noticed rail freight sector with advanced liberalisation process in one of the corridor-states does not always lead to an overall favourable condition for an efficient rail freight corridor. The cross-border nature of the European rail service suggests that it is the interaction (i.e. cooperation or collision) among all corridor states that shapes the success of the European railways. This interaction is found at a cross-border point (eg. the interoperability of two railway systems or two locomotives at the terminal, the need for changing drivers to cross the border; the accessibility of border terminal for rail service operators). This interaction is also located within a particular state (eg. whether the locomotive from A-state is eligible to drive in another B-state; whether a rail undertaking registered in A-state is entitled to apply for network access and extra services in B-state). Institutional friction between two corridor-states leads to higher transaction costs and

inefficient system. (6) The use of corridor concept broadens its scope of application in the domain of transport. Debate on transport corridors is no longer limited to the issue of infrastructure planning; extension is made to supply chain management and market steering.

To sum up, the MCC framework sets out a market-oriented, corridor-based and transnationally collaborated governance paradigm. The corridor-engaged stakeholders involved are independent, problem-driven and task-specific, consisting of both public and private parties and at the both national and European levels. MCC emphasises on the forming of horizontal cooperation, next to and in relation to the existing vertically organised institutional structure. Our hypothesis is that by advancing this conceptual governance framework challenges of removing fragmentation in pursue of an integrated European rail freight transport can be resolved with reduced transaction cost.

5. Assessment of governance practices in the European rail freight sector

The practices in governing the European rail freight sector are diverse. An overview of the existing and emerging governance practices are summarised in the Appendix. In general three types of governance practices are identified and listed in Table 5-1. They are legislative governance practice, corridor governance practice, and MCC governance practice.

| Governance exercises on EU rail freight sector | | Corridor approach | Market –driven | Transnational coordination | Issues dealt with |
|-------------------------------------------------------------------------------------------------------------------|--------------------------------------------------------------------------------------------------------------------------|-------------------|----------------|----------------------------|---------------------------------------------------------------------------|
| Type 1 – Legislative governance practice (No regards on difference between states; implementation delay possible) | Separation between infrastructure management and rail operations (eg. Dir. 91/440/EEC, Dir. 2001/12/EC, Dir. 2004/51/EC) | No | Less strong | Vertical coordination | Degrees of separation in the member states |
| | Licensing of EU railway undertakings (eg. Dir. 95/18/EC, Dir. 2001/13/EC) | No | Less strong | Vertical coordination | Types of railway undertaking licensing |
| | Allocation of infrastructure capacity and charging (eg. Dir. 2001/14/EC, Dir. 95/19/EC) | No | Less strong | Vertical coordination | Capacity allocation procedures and charges |
| | Rail interoperability (Dir. 96/48/EC, Dir. 2001/16/EC, Dir. 2004/50/EC) | No | Less strong | Vertical coordination | Interoperability parameters set up by the states |
| | Nomination of regulatory body for fair track access (eg. Dir. 2001/12/EC) | No | Less strong | Vertical coordination | Degrees of track access opening |
| Type 2 – Corridor governance practice (Problem oriented but not coordinated) | TEN-T network | Yes | Less strong | Horizontal and vertical | Railway condition and modernisation |
| | ERTMS corridors | Yes | Strong | Horizontal and vertical | Common safety standard, operational rules harmonisation |
| | PERFM corridors | Yes | Strong | Less horizontal* | Investment strategies on railway modernisation |
| | TREND corridors | Yes | Strong | Horizontal* | Rail service performance |
| | ERIM network | Yes | Strong | Horizontal* | Infrastructure supply forecast |
| | RNE corridors | Yes | Less strong | Horizontal | Path scheduling and path allocation |
| | PAN network | Yes | Less strong | Vertical | Infrastructure condition |
| | EUFRANET network | Yes | Strong | Horizontal* | Overall corridor performance |
| | TINA network | Yes | Less strong | Vertical | Infrastructure condition |
| | NEW OPERA network | Yes | Strong | Horizontal* | |
| | FERRMED Great Axis | Yes | Strong | Horizontal | Overall performance |
| REORIENT corridor | Yes | Less strong | Horizontal* | | |
| Type 3 – MCC governance practice (Integrated and coordinated approach) | BRAVO corridor | Yes | Strong | Horizontal* | Interoperability; path scheduling; customer info system; loading capacity |
| | Rotterdam-Genoa corridor | Yes | Strong | Horizontal | Overall corridor performance |
| | RETRACK corridor | Yes | Strong | Horizontal | Overall corridor performance |
| | CREAM corridor | Yes | Strong | Horizontal | Overall corridor performance |

Table 5-1 Governance practices in the domain of European rail freight transport

Note: * Research-oriented project

Legislation governance practice takes the form of setting up all kinds of legislation, including policy guidelines, directives, regulations, decisions, communications, and so on. These legislatives are laid down by the EC and they mostly concern the setting-up of common procedures or technical parameters in order to harmonise or standardise the different methods, processes, procedures or rules between the national states. These EC legislatives, once initiated, are obliged to be transposed and implemented in the member states respectively. This type of governance practice shows strong vertical interaction between the European and the national policy makers. It also implies a weak horizontal link between states. Besides, this type of governance practice does not follow market-oriented approach, as policy making and implementation takes no account of the differentiated degrees of freight traffic flows between states or regions.

With regard to corridor governance practice, governance is exercised on a bunch of selected rail corridors or rail network in some practices. In this context term network is inherently related to term corridor, as network is considered as the aggregation of the selected corridors, and corridors the components that makes up a network. As governance is corridor-wise, the structure of governance is horizontally organised along the corridor states. In addition, the corridors in this type of governance practice are selected along two main criteria. The first criterion concerns the European cohesion. It takes into account social-economic interests – the linkage with the periphery area in the EU. For example, the identification of the TEN-T network has followed this criterion among others. The second criterion refers to the extent of transnational rail freight movements. The related examples are ERTMS corridor, TREND corridor. Clearly, corridors identified by the second criterion follows a market-driven approach. Furthermore, each corridor or corridor group is initiated with the objective to remove one fragmentation. As shown in Figure 5-2, each vertical dashed arrow implies that certain fragmentation issue is dealt with on a group of selected corridors. For example, the ERTMS corridors are established particularly to standardise the rail safety systems between the states. Another example is the RNE corridors, which are launched only to harmonise the European train path allocation and application. The problem with this approach is that different corridor groups are identified to tackle different fragmentation problems with different manner. Cooperation only takes place among stakeholders, who are engaged in varied corridors of one group. Different fragmentation problems are tackled on different corridor groups with different manners. There is little harmonisation

or integration between these corridor groups in terms of layouts and objectives. Figure 5-4 illustrates an inconsistency between the corridor groups in terms of their geographic layouts.

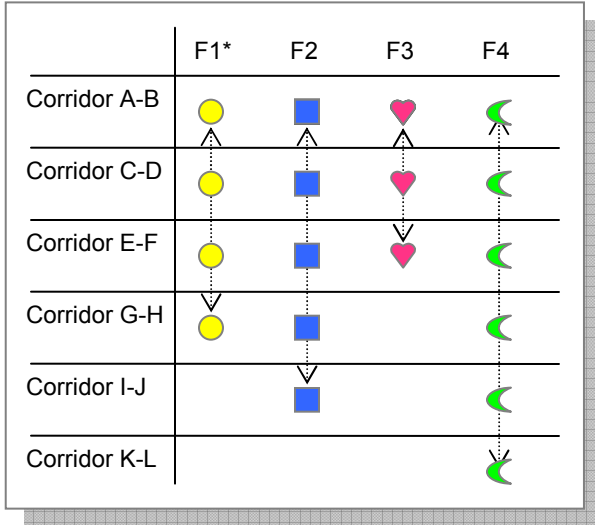


Figure 5-2 Integrated and coordinated MCC governance practice (F1, F2, F3, F4 presents different type of fragmentation problems)

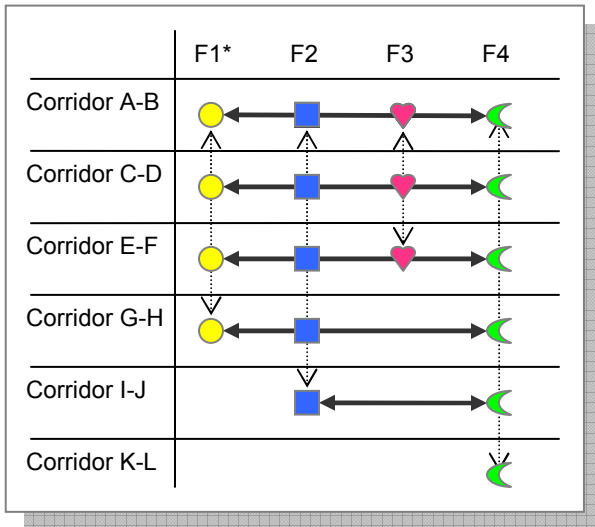


Figure 5-3 Integrated and coordinated MCC governance practice (F = Fragmentation)

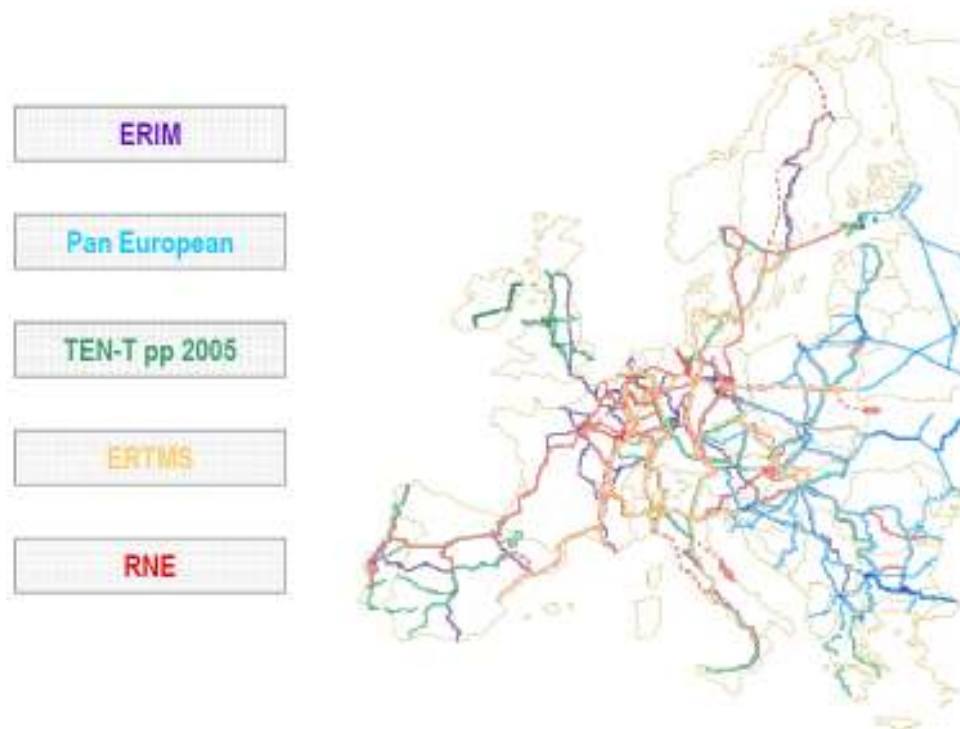


Figure 5-4 European Rail Corridor Management – overview of various European corridor approaches (RNE, 2007).

The MCC governance practice is illustrated in Figure 5-3 by the horizontal continuous arrows. In this practice each corridor is freight dedicated and is identified based on considerable freight volumes on the corridor. One important difference from the corridor governance practice is that: instead of different fragmentation problems being tackled by different corridors, the one and the same transnational rail corridor is chosen based on which different fragmentation problems are tackled. The cooperation takes place among all engaged stakeholders on this corridor. This type of governance practice corresponds, to a large degree, to the MCC governance framework set out in Section 5. It seems to be an integrated and coordinated approach, and is most effective in terms of resolving fragmentations and in terms of efficient corridor service operation.

6. Discussion and conclusion

The idea of the work comes from the observation that the current governance is facing challenges in responding to the dynamics in the European rail freight market, and that it is not effective in dealing with various facets of fragmentation in the European railway

system. The key concern is the mismatch between the fragmentation problems, which are horizontally and transnationally structured, and the corresponding governance, which is vertically and territorially-bounded.

This paper devotes itself to the designing of a conceptual governance framework – MCC in the domain of the European rail freight sector. MCC is designed under the assumption that governance is effective when its scalar dimension corresponds to that of the economic process. It is advanced in efforts to effectively tackle the problems in the fragmented railway market. The MCC design is built upon a multidisciplinary approach where integration of theories such as multi-level governance, supply chain management concepts, and geographic concepts like corridors and networks is employed. The nature of the MCC framework is problem-driven, market-oriented and corridor-based. It puts the lens on the forming of horizontal transnational cooperation next to and in relation to the existing vertically-structured institutional arrangement. We then make our first attempt to use MCC as to assess various governance practices in the rail freight sector along three dimensions: corridor embeddedness, market drive, and transnational collaboration structure. We divide these governance developments into three categories and claim that the type which resembles the MCC structure is most effective in dealing with rail fragmentation problems. Several implications are drawn based on this extensive piece of work:

(1) The European rail freight economy cannot be an aggregation of many fragmented national economies. Neither can it be governed simply by aggregating different national systems which are operated under diverse state governance approach, and driven by varied national economic interests. There is a need for governance approach in the European rail freight sector to advance from Type I multi-level governance to Type II multi-level governance; from one that is controlled primarily by the independent and separated national states, to one that is steered by a number of stakeholders, transnational, comprising both governmental and non-governmental stakeholders.

(2) The MCC governance in the European railway sector highlights several elements: *a.* horizontal and transnational collaboration among the national governments, among the market players and transnational agencies, and between the public and the private; *b.* the stakeholders involved in governance are independent, problem-driven and task-

specific; c. an integrative problem-solving approach where all tangible and intangible fragmentation problems are centralised and tackled on one and the same corridor; d. during negotiation and collaboration, individual stakeholders subject to both gains and losses; decisions goes beyond solely national states' interests, the EU, transnational agencies and the market players come to gain more authority, e. A rail freight project at the national level can mean differently at the European level.

(3) Although MCC governance focuses on horizontal and transnational collaboration, it, however, does not suggest that the existing vertical collaboration is totally inadequate and should be discarded. Vertical organisation of governance contains its own function and purpose. For example, with regard to the monitoring of policy implementation, a vertical, hierarchical structure is likely to be more effective than a horizontal one. However, since vertical collaboration between the EU and the state policy makers has long been recognised and widely applied by policy makers in problem-solving, there is a need to realise the existence of its alternative, the horizontal linkage, and make effective use of it. Whether governance should be more vertical or more horizontal, it generally depends on the nature and scale of the problem.

(4) Largely inspired by policy fields like regional and cohesion policy, multi-level governance theory, however, faces limited application in other arenas. Therefore, using this theory to explain phenomena and design governance strategies in the domain of rail freight transport broadens the scope of theory application.

Based on the above discussion, future research agenda is set up, which will be addressed in the next step of the broader research work. The research questions are formulated as follows:

(1) With respect to the application of the MCC governance framework in practice, how does MCC framework leads to concrete strategies to tackle the fragmentation problems in the railway system?

(2) What types of fragmentation problems can be tackled, with most effect, by the strategies that are generated based on the MCC framework?

(3) How to ex ante evaluate the MCC-based strategies in terms of both effectiveness and the implementation feasibility? (Delphi method, interviews)

(4) To what degree is the third type of governance practices – MCC exercised in reality? In particular, for each corridor to what degree are governance exercised along the three dimensions: corridor, market and transnational collaboration? What are the strengths and weaknesses concerning the governance? Once the MCC-based governance strategies and measures are devised, will these strategies considered to further support the development of these rail freight services?

Appendix Description of EU rail freight corridor practices

| Corridor practices | Description |
|-----------------------------------------------------------------------------------------------------------------------|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| 1 TEN-T corridors (Trans-European Transport Network) 1992-2020 | TEN-T deals with financial instruments to complete the 'missing links' and to expand the existing networks in the EU by 2020. It is a long-term programme with its first action plan coming as early as in year 1990. In 1992, TEN-T was legally stipulated in the Treaty of Maastricht. The goal of TEN-T is to improve the interconnectivity and interoperability between national transportation systems. TEN-T is a multimodal network and it includes approximately half of all freight and passenger movements in Europe. It is identified on the basis of initial state pre-selection of infrastructure projects. To date, TEN-T has grown from 14 to 30 priority projects, among which 22 projects are railway projects. |
| 2 ERTMS corridors (European Rail Traffic Management System) 2005-2020 | ERTMS was launched in 2005. In total six corridors are identified and 15 states (+Switzerland) engaged. The goal of ERTMS is to deploy on all corridors one single European safety standard. Sub-goals are defined as infrastructure modernisation, capacity expansion, operating rules harmonisation. ERTMS corridors are identified based on the ERIM network study, the criteria of high freight traffic flow, and the wide coverage of EU states. The length of all six corridors represents 6% of that of the TEN-T network and as high as 20% of European freight traffic. In terms of governance structure, an EC nominated coordinator monitors activities of all corridors and acts as liaison between all stakeholders. The states commit on the corridor initiative by means of a Letter of Intent (LOI). The stakeholders involved are EC, infrastructure managers, railway undertakings, rail track construction companies, locomotive makers, and ICT companies. |
| 3 PERFM corridors (Primary European Rail Freight Network) 2006-2007 | PERFM is a study conducted by CER with the support of UIC and McKinsey. The goal of this study is to come up with investment strategies for infrastructure improvements in order to absorb the growing rail freight demand of 72% and to increase rail market share from 17% to 21%-23% by 2020. The PERFM network is based on six corridor business cases, which are the extension of the ERTMS corridors. |
| 4 TREND corridors (Towards new Rail freight quality and concepts in the European Network in respect to market Demand) | TREND is a research project aiming at assessing the general progress in the establishment of the European Railway Area (ERA). It provides an inventory of problems, causes of railway corridors and in relation to corridor performance and it sets out action plan on the corridors. The corridors are selected based on current and potential freight flows, interests from the consortium partners, compliance with TEN-T railway network and ERTMS. |
| 5 ERIM corridors (European Rail Infrastructure Masterplan) 2003- | ERIM network is a rail infrastructure study conducted by UIC since 2003. The study is based on solid rail database and regular consultations with the members of UIC, CER, EIM and RNE. Within the study 10 corridors are identified and 32 countries are involved. Six of them are freight oriented corridors, which correspond to the ERTMS corridors. The goal of ERIM network is to gain an overview about the infrastructure supply on the major international rail corridors in relation to the forecasted traffic growth by year 2020. |
| 6 RNE corridors 2004 onwards | RNE is established by 33 infrastructure managers, which coordinate 10 international railway corridors in Europe with regard to the capacity planning, cross border profiles. Within RNE the OSS serves a customer contact points for offering international path capacity. |
| 7 PAN corridors 1994-no data | The 10 PAN European transport corridors were initially identified as a result of the PAN European conference of the Ministry of Transport. They are considered as the important routes in the Central Eastern European Countries. The PAN corridors have been adjusted and combined into the TEN-T corridors. |
| 8 TINA network | The backbone of TINA network was earlier formed by then Helsinki corridors and subsequently additional |

| | | |
|----|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| | 1995 - | network components were proposed, analysed and added to the network. During the years, TINA network has evolved into TEN-T network. |
| 9 | NEW OPERA network (New European Wish: Operating Project for a European Rail Network) 2005-2008 | Coordinated action |
| 10 | BRAVO (Brenner Rail Freight Action Strategy Aimed at Achieving a Sustainable Increase of Intermodal Transport Volume by Enhancing Quality, Efficiency, and System Technologies) 2004-2007 | BRAVO is a research project to increase the volume on a length of 448 km from Munich to Verona, which is one of the most loaded international transit freight corridors. Multiple tasks are focused on the same corridor, such as interoperability involving multi-current locomotives, path scheduling, customer information system to increase reliability, wagon technology development to increase loading capacity. |
| 11 | EUFRANET Network (European Freight RAILway NETwork) 1997 – 1999 | EUFRANET is a research project, which identify and evaluate global strategic options for the developments of Trans-European Rail Freight Network to improve overall performances of the rail freight network. |
| 12 | FERRMED Great Axis (the keystone of Rail Freight Competitiveness in Europe) 1994 onwards | FERRMED is a non-profit association initiated by a large group of private stakeholders. The FERRMED Great Axis Scandinavia-Rhine-Rhone-Western Mediterranean concerns a zone of most important economic and logistic industry in the EU. The interest in this axis is to develop the ports in association to the respective hinterland area as a means to increase the competitiveness of the EU. |
| 13 | Corridor Rotterdam-Genoa 2003 onwards | Corridor Rotterdam – Genoa is an initiative of the Netherlands, Germany, Austria, Switzerland and Italy to improve the conditions for freight transport on corridor Rotterdam – Genoa |
| 14 | RETRACK corridor 2006 – 2010 | RETRACK is an EU research project, which is to demonstrate the competitiveness of private railway undertakings by developing a commercial feasible rail freight service between port of Rotterdam the Netherlands and Constanta in Romania. (website: http://www.retrack.eu/) |
| 15 | CREAM corridor 2007 – 2009 | CREAM is an EU research project, which designs and validates advanced customer-driven business models for railway undertakings and intermodal operators by developing intermodal rail freight services between the Benelux countries and Turkey. (website: http://www.cream-project.eu/general/schedule.php) |
| 16 | REORIENT corridor | REORIENT is an EU research project that assesses the progress in implementing EU rail legislation and its subsequent impacts on the rail freight market on corridor across 8 countries from Northern Europe to South-East Europe. (website: http://www.tmleuven.be/project/reorient/home.htm) |

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