

KINGDOM OF MOROCCO



*Department of Studies and Financial Forecasts*

## ***Sector of transport of goods:***

*Constraints and ways of reform*

**DSFF Studies**

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### **List of acronyms**

<b>AMLOG:Moroccan Association for Logistics</b>
<b>TEU:Twenty-foot equivalent unit</b>
<b>OCP:Sharif Office of Phosphates</b>
<b>ONCF:National Office of Railways</b>
<b>SME:Small and medium-size enterprises</b>
<b>RAM:Royal Air Maroc</b>
<b>SNTL:National Company of Transport and Logistics</b>
<b>HST:High Speed Train</b>
<b>VSE:Very small enterprises</b>
<b>TIR :Transport International Routier (international road transport)</b>

## Introduction

In an increasingly competitive environment, Morocco more than ever before needs a competitive and dynamic transport sector in line with the structuring projects and major reforms, initiated by our country with a view to improving the competitiveness and the productivity of its economic fabric. Indeed, this sector contributes a total value of 5.8% of the total added-value and 10.3% of the tertiary sector in 2011 at constant prices. Its added-value increased from 19.6 billion MAD in 2000 to 33.8 billion MAD in 2011, or an average annual growth of 5%. In terms of jobs created, transport (including warehouses and communications) employed, in 2011, nearly 493.460 people, accounting for 4.7% of the employed labor force, including 76% in urban areas.

Moreover, transport of goods is undoubtedly necessary for the good performance of the productive fabric, besides its involvement in all the value chain links, upstream and downstream. It is a support sector contributing to national growth, as shown by the positive correlation between the development of the entire economic activity and the growth of the sector<sup>1</sup>. Further, the role of the transport sector is crucial in the integration of the national economy in the global economy, as well as in relieving the isolation of remote areas of the national territory, making it possible to suppress monopolistic pressures and interregional inequalities.

However, the transport of goods remains relatively under-developed because of its fragmented structure, old age, high cost and the insufficiencies recorded in management organization. To overcome these handicaps, our country has engaged, in recent years, in a modernization process of the sector and the development of its infrastructures<sup>2</sup>. The objective is to introduce competition, to regulate the market and to supervise small operators, who conduct their activity in an informal fashion, in order to rehabilitate this sector so that it ensures its support to national economic activity.

This report deals in its first section with the major constraints hindering the good performance of the sector of the transport of goods. This section also evaluates

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<sup>1</sup>0.4 with a delay of one year at a confidence threshold of 95%.

<sup>2</sup>See Frame 1.

the competitive edge of certain sectors, including transport. The second section tackles the major actions implemented in order to modernize and reform the sector of the transport of goods, especially those established within the framework of the new strategy of logistics. The third section provides an evaluation of the impacts of the various pro-competing actions undertaken, using a two-sector general equilibrium model.

## **1. Diagnosis of the sector of transport of goods**

The major modes of the transport of goods in Morocco are road transport, maritime transport, and rail<sup>3</sup> transport. The sector suffers from a number of handicaps which reduce its competitiveness and weaken its competing intensity, hence calling upon the public authorities to make efforts in terms of reforms and investment in infrastructures whose new strategy of logistics, designed in April 2010, outlines the most important components.

### **Frame 1: National investment plan (2008-2012) for the development of transport infrastructures**

This plan incurred a budget of 120 billion MAD to develop the infrastructures of the sector. An envelope of 31 billion MAD is devoted to highways, 21 billion MAD to coach stations and railway network within the framework a general program, 20 billion MAD to High Speed Train, 18 billion MAD to the project of Tangier Med II, 8 billion MAD for the maintenance of roads, 8 billion MAD for the construction of 2000 km rural roads per annum, 5.8 billion MAD for airports, 3.3 billion MAD for the maintenance of other airport projects, 2 billion MAD for the construction of 700 km of expressway roads and 2.4 billion MAD for the Mediterranean by-pass (in addition to an investment of 15 billion MAD for the construction of 384 km new highway links).

### **1.1. Obstacles to the development of the transport of goods...**

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<sup>3</sup>Air transport remains the major means of the transport of passengers and contributes only a little to the circulation of products. The opportunities offered for air freight as a means of opening on new markets of exports and as an outlet of niche products such as aeronautics, electronics, top-of-the-range textile, will be the subject of a later analysis in order to better determine the characteristics of such activity.

Road transport constitutes the major mode of domestic transport of goods insofar as it accounts for more than 75% of the national freight (except phosphates). Trucks remain the first road means of transporting goods. This fleet consists of 20.000 road carriers, operating 73.275 trucks, including 53% hired and 47% owned.

However, the road transport of goods suffers from several difficulties, which slow down its development and hinder its operation. These include the atomicity and fragmentation reflected in the composition of the sector, dominated by VSE and SME which account for 95% of the companies operating in the sector, 90% of which are individual businesses, which own an average fleet of 3 to 5 trucks each. These small entities generally escape social and tax legislation, compared to the structured companies which account for only 10%. Noteworthy also is the outdated character of the national fleet, whose average age is 13 years<sup>4</sup>.

In addition, the strong competition exerted by informal activity, whose share exceeds 40%, constitutes a true handicap for the development of this sector. The entire set of these factors contribute to making transport costs relatively high in Morocco and negatively impacts the competitiveness of national production.

As for maritime transport, which ensures more than 95% of the transport of foreign trade, it encounters a number of obstacles, particularly relating to the problems of high costs as well as its mode of organization, which hinder its productivity. It should be noted in this respect that the cost of crossing the strait amounts to about 500 euros, or two to three times as much compared to the cost of similar crossing distances<sup>5</sup>. Therefore, it seems essential to modernize the sector to make it competitive and efficient. The major actions to be undertaken should target tariff revision, separation of the traffic of passengers from that of goods, as it has been initiated recently between the Port of Tangier City and that of Tangier Med, improvement of the quality of services delivered to ships and goods, as well as the development of road traffic starting from the new port of Tangier Med.

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<sup>4</sup>The fleet is characterized by three age groups: 53% of trucks are more than 10 years old, while 34% are more than 15 years old and 22% are more than 20 years old.

<sup>5</sup>“Logistics of trade and the competitiveness of Morocco”, World Bank, 2006.

With regard to railway transport, it is characterized by a weak coverage of the national territory. Moreover, the prospective increase of activities in Tangier Med<sup>6</sup> could accentuate the insufficiency of the railway services, hence the need and importance to reinforce this network so that it can cover 30 to 35% of the traffic coming from Tangier Med.

The railway transport of goods is also characterized by the dominating weight of phosphate traffic, which accounts for more than 70% of transported tonnage.

**Table 1: Dependence of rail traffic on phosphate goods**

(In million tons)

	2002	2003	2004	2005	2006	2007	2008	2009	2010	2011
<b>Production of phosphate</b>	23	22,9	25,4	27,3	27,4	27,8	24,9	18,3	26,6	28
<b>Transported tonnage</b>	22,8	23	25,3	27	27,1	27,8	23,6	18,2	27	28
<b>Traffic of goods</b>	29,9	30,6	32,9	35,2	35,5	35,9	31,7	25,1	36	37
<b>T.phosphate/T. goods</b>	76%	75%	77%	77%	76%	77%	75%	72%	75%	76%

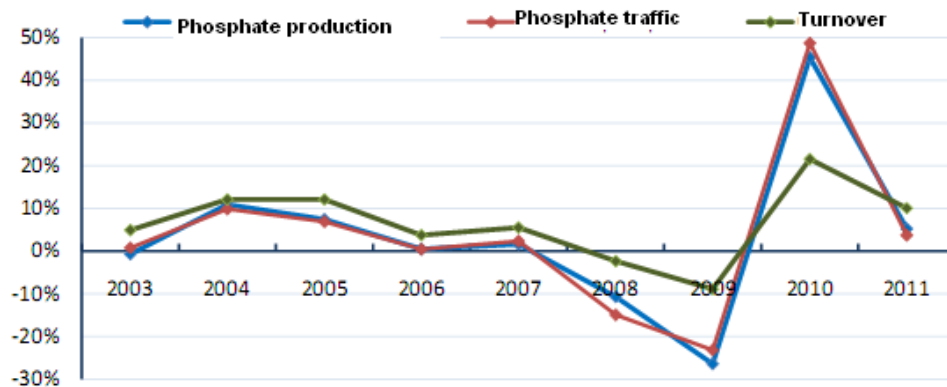
Source: OCP and ONCF.

The analysis of the financial results of ONCF reveals the importance of the weight of the traffic of goods (including phosphate) in the turnover of the Office (58% over the period 2008-2011), hence the effect of the development of the production and phosphate traffic on the performance indicators of ONCF.

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<sup>6</sup>Port Tangier Med, with the extensions in progress, will make it possible by 2015 to reach a processing capacity of more than 8 million containers TEU, 7 million passengers, 700.000 trucks, 2 million vehicles and 10 million tons of hydrocarbons.

**Graph 1: Effect of phosphate production on ONCF financial results**



Indeed, ONCF attaches much interest to the support of its main clients to its development, in this case OCP. Partnership agreements<sup>7</sup> between the two operators and the creation of a department dedicated to OCP within ONCF is a pertinent example. It should be noted in this regard that OCP launched the project “slurry pipeline Khouribga Jorf” in order to convey approximately 38 million tons of phosphates per annum through pipelines for a cost price estimated at 25 dollars a ton.

## 1.2. ... combined with a relatively low competing intensity...

The sector of transport of goods would be more efficient by consolidating the reforms which target redressing the organizational, structural and infrastructure insufficiencies. These insufficiencies would be due partly to the quasi monopolistic conduct in certain segments of this sector, hence the need for evaluating the competitive intensity of such sector by means of markup calculation.

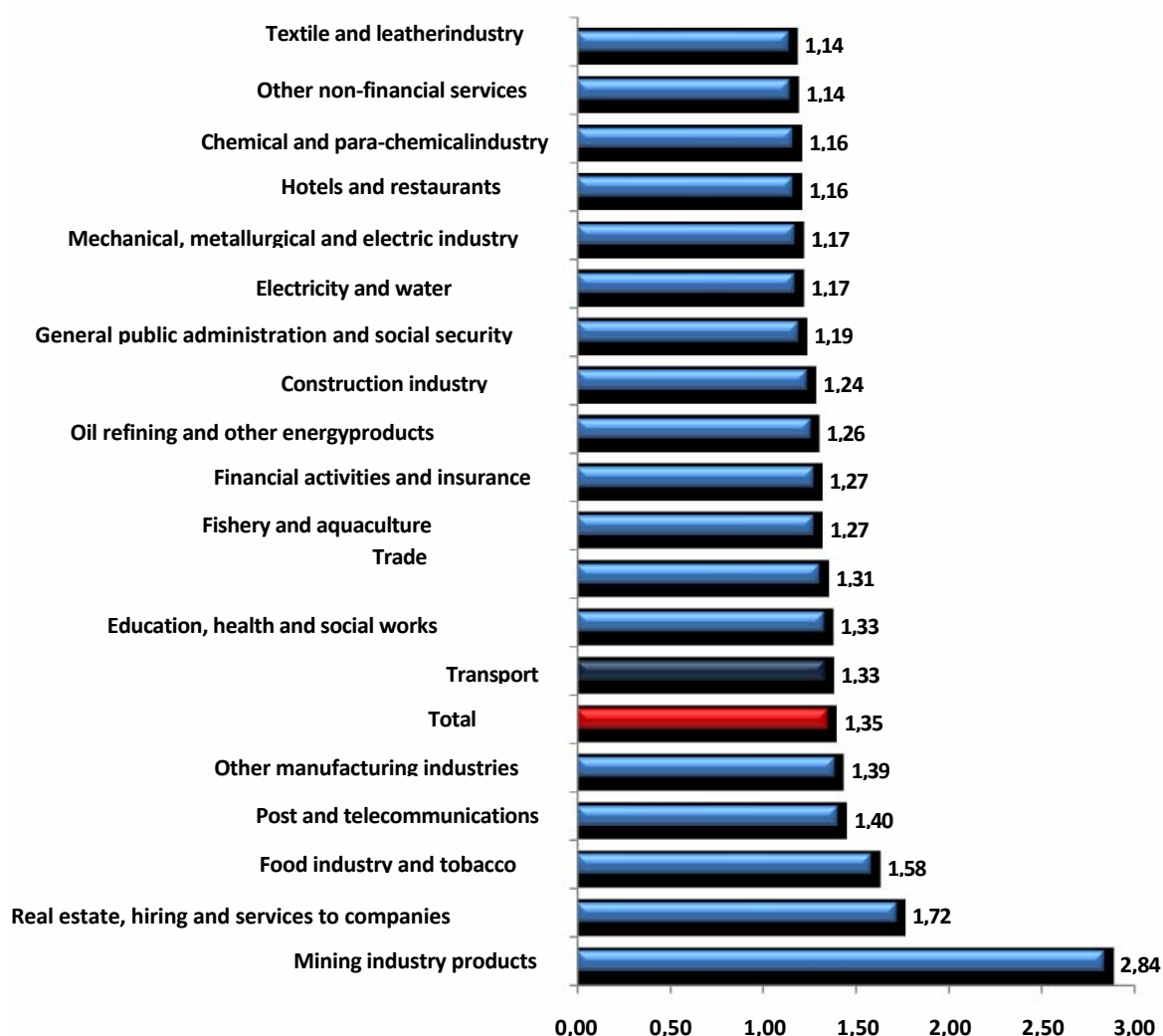
### ***Frame 2: Markup: index of competitive intensity evaluation***

Markup (or economic margin) makes it possible to measure the competitive intensity of a given sector. The more competitive the sector is, the more the markup approaches 1; whereas a markup higher than 1 means that the profits of the sector are abnormally high. The calculation of the markup is based on added-value and the remuneration of the factor of production, namely labor and capital. In other words, the field of its analysis is limited to the sphere of production.

<sup>7</sup>They are two commercial agreements extending over a period of ten years: the first 1994-2003 and the second 2004-2014; these relate to the rail-way transport of phosphates.



Graph 2: Estimates of markups by sector of activity



The mining industry posts the highest markup (2.84), due to the importance of the phosphate industry, whose production is monopolized by the Sharif Office of Phosphates (OCP).

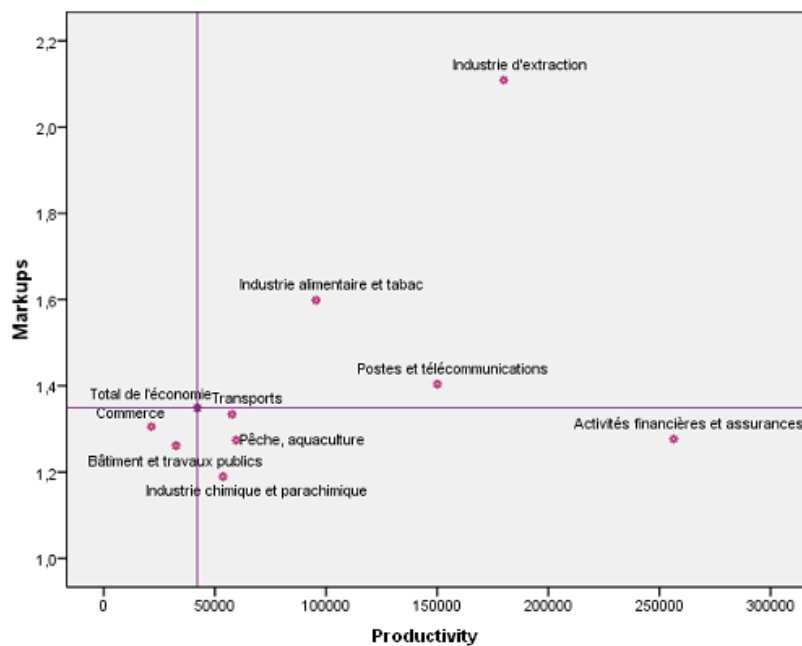
As regards the transport markup (1.33), it is close to that of trade (1.31), because of the similarity of their structure. They are fragmented sectors made up mainly of small operators, besides the negative effects of the significant weight of informal activity.

The competitive intensity of the sector of transport differs only slightly from that of the entire national economy (whose markup equals 1.35). This means that the efforts made to reform the sector and establish competition have started to pay off,

but remain insufficient, hence the engagement of the public authorities in an integrated reform reflected in the logistics strategy.

It should be noted in this regard that the aggregation of the transport data in the national accounting makes it difficult to analyze the competitive intensity specific to each sub-sector, as well as the evaluation of the public policies implemented to establish competition in the various components of such sector.

**Graph 3: Markups and labor productivity by sector for the base year 1998<sup>8</sup>**



Source: DSFF Calculation

In addition, the analysis of markups in relation to the productivity of activity sectors reveals that the majority of sectors have a markup and productivity around the national average, including the transport sector. On the other hand, the mining industry is characterized by a high markup coupled with high productivity. Finally, the sector of finance and insurance activities are characterized by high productivity and a relatively weak markup.

## 2. Reform of the transport of goods

The sector of the transport of goods, with the entire set of its components, has

<sup>8</sup>The processing was based on the data of the base year 1998 considering the unavailability of information, for the remaining years, concerning employment for the transport sector dissociated from that of post and telecommunications. Indeed, apart from the base year 1998, the employed labor force is published in a consolidated fashion for the sector "transport, warehouses and communications".

undergone significant reforms in recent years to improve the competitive edge of the sector as regards quality, cost, lead time and organization.

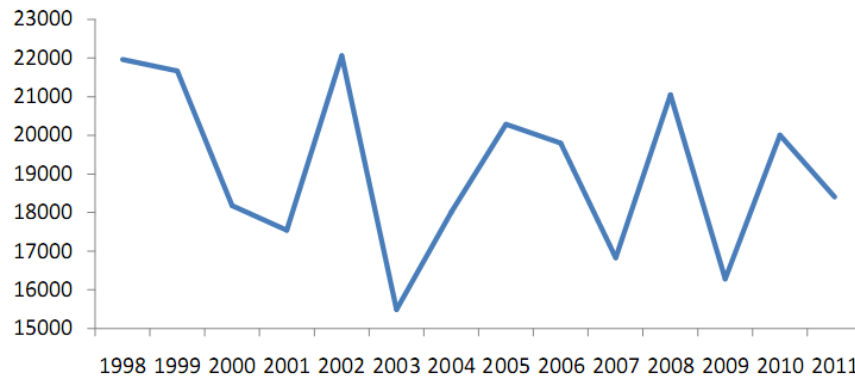
## 2.1. Towards the liberalization of road transport

The reform of the sector of road transport of goods, implemented in 2003, aimed at making this sector competitive and dynamic, by putting an end to the situations of unwarranted revenue and monopoly which characterized it. This reform also aimed at upgrading national transport to international standards, with a view to meeting the requirements of opening onto the global economy and taking up the relevant challenge of improving the competitive edge of the national economy.

### *Frame 3:2003 reform lines of road transport of goods*

- ✚ Encouragement of private initiative and the promotion of investment in the sector of road transport of goods by the abolition of “approval” and the removal of the quantitative restrictions concerning the services offered;
- ✚ Redefinition of the relations between shippers and carriers through removing the monopoly of freight previously reserved to ONT (National Office of Transport), liberalization of transport tariffs of goods and the introduction of standard contracts;
- ✚ Integration of the informal fleet within the organized sector by adopting procedural and administrative facilitation;
- ✚ Professionalization of the sector by introducing qualitative criteria for access to the business of the transport of goods for hire or reward and the creation of new trades; in this case the commissioner and renter of motor vehicles should serve as support to the function of the transport of goods and to operate following the example of the carrier within a competitive framework.

**Graph 4: Trend of the traffic of goods transported by SNTL over the period 1998-2011 (thousand tons)**



Source SNTL

Nevertheless, the measures undertaken within the framework of this reform did not deliver the expected results. Moreover, the weight of informal activity, which remains significant (45%), and the trend of transported tonnage indicate the limited effects of such reform. The government was then driven to present, in May 2010, within the framework of the national strategy of logistic competitiveness, an action plan designed by the Ministry in charge in consultation with the professionals, to remedy the insufficiencies noted.

The roadmap, resulting from the implementation contract, presents the main lines of the new policy of the public authorities in the field of the transport of goods. It relates to the following:

- Reinforcing the organization of the sector of the transport of goods by determining the terms of access to the road carrier activity in terms of financial capacity, professional aptitude and training;
- Upgrading the legal environment of the road transport of goods for hire or reward by stressing the need for organizing the relations between the various actors by establishing standard contracts of transport, hiring and subcontracting, as well as institutionalizing the joint responsibility of the entire set of actors in the transport operation (client, shipper, forwarding agent,...);

- Improving competitiveness of the companies of the road transport of goods. The claims of professionals aim at the fight against dumping by the publication of standard prices, establishing occupational gas oil and introducing a flat-rate taxation system for small size transport companies.
- Developing international road transport in order to reinforce the participation of the national fleet in international transport;
- Modernizing road transport by reinforcing the control of vehicles of goods transport and progressively introducing company inspection.

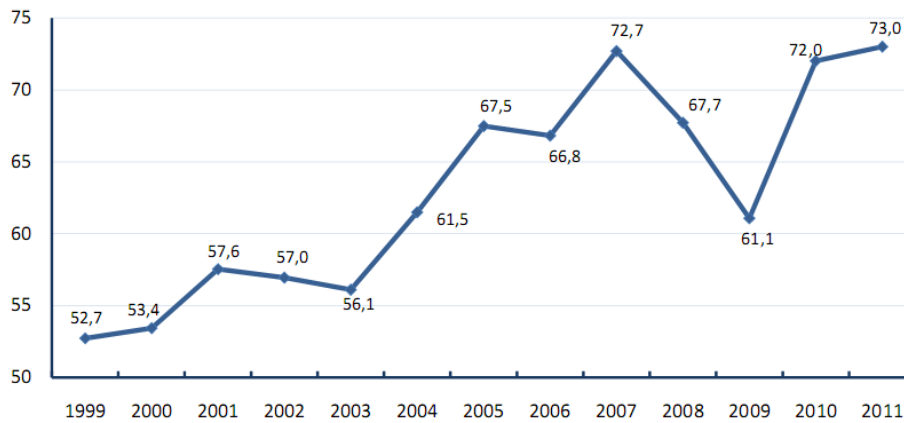
## **2.1. Reforming maritime transport to upgrade its competitiveness**

Maritime transport of goods is of special importance insofar as it benefits from a coast line of 3500 km to ensure the transit of more than 95% of the foreign trade through 30 ports. The Port of Casablanca, considered as a general-purpose port, monopolizes more of the third of the total traffic. The Port of Mohammadia (17%) is specialized in oil-product traffic, that of Agadir (5%) in fishery products, fruits and vegetables. The ports of Safi (6.5%) and Jorf Lasfar (23%) in minerals, that of Tangier (6.5%) in the transport of passengers and goods, and the Port of Nador in steel, mining and agri-food industries.

In terms of development, the sea traffic posted, over the period 1999-2011, an average annual increase rate of 3% to stand at 73 million tons in 2011, as against 52.7 million tons in 1999. It should be noted that the intensity of port traffic and the nature of transported products hinge on several parameters. Chief of these are the level of precipitations determining the level of cereal import and that of the export of agricultural products, the policy adopted as regards the storage of strategic products, the trend of tariffs in the international market, as well as the competitiveness standard of national exports. In 2008 and 2009, the sea traffic decreased significantly under the effect of the international crisis, and fell to 67.7 and 61 million tons respectively. It recovered to its pre-crisis level due to the rise posted in 2010.

**Graph 5: Trend of the volume of goods transported by sea**

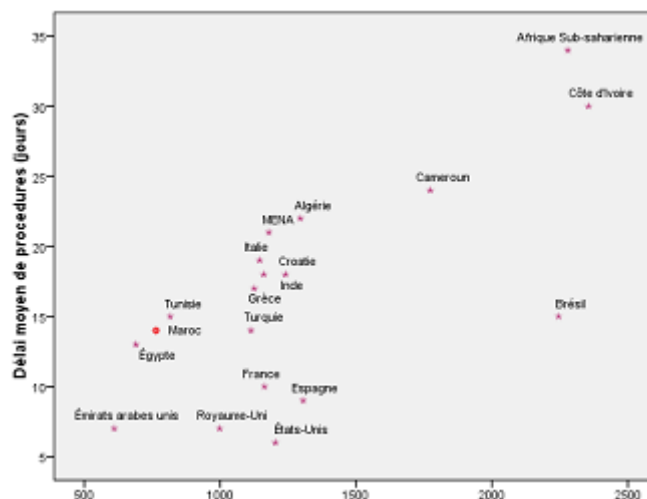
over the period 1999-2011 (in million tons)



Considering the importance of this means of transport in Moroccan foreign trade, and the scale of problems in terms of organization and high costs that the sector faces, a reform of maritime transport was implemented in 2006. It revolved around three lines, namely, the clarification of the roles and missions of actors, establishing the uniqueness of the operator for the operations of loading and unloading of ships and the introduction of competition within and among ports. The targeted objectives were as follows:

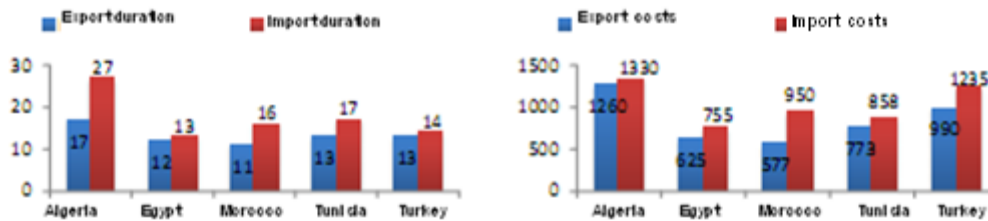
- Substantial improvement of the quality of the port service and upgrading the competitive standard of ports;
- Reduction of handling costs by about 30% for the containers and of 25% for TIR trucks;
- Encouragement of private sector investment in port infrastructures and operation;
- Simplification and easing of the entire chain of port service;
- Transparency in the transactions between actors of the port logistics chain.

**Graph 6: Duration of procedures and average costs of export/import**



Source:Doing Business, World Bank, 2013

**Graph 7:Costs of container export/import (in US\$),  
and export/import lead time (days)**



Source:“Doing business 2013”, World Bank.

In addition, the ports of Casablanca and Tanger dominate the port traffic.They respectively ensured the transit of 14.9 and 5.1 million tons in 2007.These figures remain lower than those achieved in the ports of competitor countries such as Algeria (24.3 million tons in Skikda) and Egypt (20,2 million tons inPort Saïd and 25.1 million tons in Alexandria).



The difference is even more significant compared to northern Mediterranean coast (74.8 million tons in Algeciras and 96 million tons in Marseilles), in spite of more competitive costs and procedures showing the importance of the proximity of these ports to a wide and open EU market and an open productive fabric. In terms of container costs, Morocco occupies a position relatively comparable to its main competitors.

**Table 2: Characteristics of the main commercial ports of Morocco**

	<b>Agadir</b>	<b>Casablanca</b>	<b>Tangier</b>	<b>Tangier Med</b>
<b>2009 Traffic (thousands of T) <sup>9</sup></b>	3.038	19.999 <sup>10</sup>	3.899	100.000 (estimate)
<b>Surface (ha)</b>	42	87	14	78
<b>Maritime fleet</b>	<ul style="list-style-type: none"> <li>•Bulk (57%)</li> <li>•Containers (28%)</li> <li>General goods (15%)</li> </ul>	<ul style="list-style-type: none"> <li>•Bulk (42%)</li> <li>•Containers (34%)</li> <li>•General goods (24%)</li> </ul>	<ul style="list-style-type: none"> <li>•Roll-on/roll-off (75%)</li> <li>•Mixed (19%)</li> <li>•Containers (6%)</li> </ul>	n.d
<b>Connections to the port</b>	<ul style="list-style-type: none"> <li>• highway (Agadir-Marrakech)</li> </ul>	<ul style="list-style-type: none"> <li>•highway</li> <li>•railway</li> </ul>	<ul style="list-style-type: none"> <li>•road</li> <li>•railway</li> </ul>	<ul style="list-style-type: none"> <li>•highway</li> <li>• railway</li> </ul>
<b>Regular lines</b>	3	7	2	n.d
<b>Weekly capacities</b>	2250 (TEU)	6780 (TEU)	1250 (TEU)	n.a
<b>Infrastructures</b>	<b>5 terminals:</b> <ul style="list-style-type: none"> <li>•Multi use (roll-on/roll-off, bulk)</li> <li>•Containers</li> <li>•Cereals and passengers</li> <li>•Minerals</li> <li>•Oil</li> </ul>	<b>4 terminals:</b> <ul style="list-style-type: none"> <li>•Containers</li> <li>•Roll-on/roll-off</li> <li>•General goods</li> <li>•Minerals</li> </ul>	<b>2 terminals:</b> <ul style="list-style-type: none"> <li>•Mixed (containers, bulk, general goods)</li> <li>•Roll-on/roll-off (passengers and goods)</li> </ul>	<ul style="list-style-type: none"> <li>•Tangier Med I (Container terminals)</li> <li>•Logistic platform</li> </ul>

Source: "Priority Investments for the development of logistics in the Mediterranean", Invest In Med, Study N°4/September 2009.

<sup>9</sup> Port activity (including the transshipment at the port of Tangier Med) posted a volume of 92.3 million tons in 2012.

<sup>10</sup>By adding the activity of the port of Mohammadia, the harbor traffic of Casablanca concentrates 50% of the trade of the country.

With a view to modernizing maritime transport, and improving Moroccan competitiveness in international trade, major maritime construction and extension projects were carried out in order to meet the increase in demand and reduce the ship waiting time in ports. The new port Tangier Med, with a budget of more than 5 billion Euros, a capacity of 100 million tons per annum, and a surface of 72 hectares, constitutes the flagship project of North Africa. Its management is ensured by a myriad of international operators such as PSA (Singapore), APM Terminals (Denmark), Marsa Morocco, EuroGate (Germany) and Hanjin Shipping (South Korea).

Concerning the increase of capacity, two projects are to be highlighted: the first is already completed, namely the port of Agadir (32 million Euros). The second incurred a budget of 164 million Euros for the extension of the port of Casablanca, whose works are well underway. Furthermore, 3.3 billion dirhams was allocated in 2012 to the extension of the port Jorf Lasfar, as part of the global development plan of OCP Group for the period 2010-2020 for a total amount of 114 billion dirhams.

The diversity of the maritime fleet (bulk, containers, roll-on/roll-off and various goods) and its connectivity to European ports through regular lines make it possible for Morocco to benefit from its strategic geographical location for a better integration in international trade, as the main crossing point of goods in Africa towards Europe and the other side of the Atlantic.

**Table 3: Main port investments in Morocco**

	<b>Agadir</b>	<b>Casablanca</b>	<b>Tangier Med</b>
planned investments	Development of two new commercial wharves	<ul style="list-style-type: none"> <li>• New container terminal</li> <li>• redevelopment of land access points to port</li> </ul>	<ul style="list-style-type: none"> <li>• Passenger terminal</li> <li>• Bulk Terminal</li> <li>• Roll on/roll-off terminal</li> <li>• Oil terminal</li> <li>• Terminal for vehicles</li> <li>• Export processing zone</li> <li>• Tangier Med II (2 additional container terminals) in the medium term</li> </ul>
<b>Amount</b>	32 M€	164 M€	5.067 M€
<b>Reasons for investment</b>	<ul style="list-style-type: none"> <li>• To increase capacity of the port;</li> <li>• To reduce ship waiting time</li> </ul>	<ul style="list-style-type: none"> <li>• To increase port capacity;</li> <li>• To reduce ship waiting time;</li> </ul>	<ul style="list-style-type: none"> <li>• To meet the increasing demand</li> <li>• To transfer passengers and goods transport activities from the port of Tangier towards the port of Tangier Med</li> </ul>

Source: "Priority investments for the development of logistics in the Mediterranean", Invest In Med; Study N°4/September 2009.

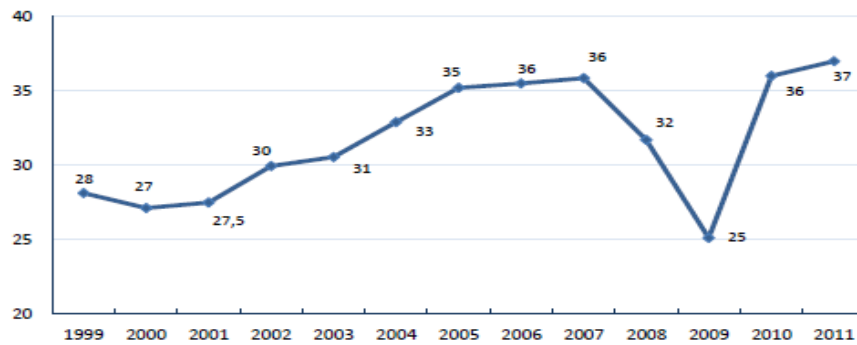
## 2.2. Diversification of activity and extension of railway network

With regard to railway transport, ONCF has 6.386 goods cars 70% of which are intended for the transport of phosphates and other minerals, chemicals, fertilizers, etc. These wagons are characterized by their old age averaging 29 years. The income of the Office is made up of more than 60% from revenues of the freight of goods. Passenger transport accounts for one-third of revenues.

The policy adopted by ONCF, in the last decade, in order to develop its activity was outlined in two five-year plans:

- The 2000-2004 Plan aimed at the increase of the length of rails, which multiplied by more than five times from 370 km to 1.907 km.
- The 2005-2009 plan which aimed at upgrading of the existing railroad network and the reinforcement of the capacity major lines.

**Graph 8:Trend of rail freight over the period  
1999-2011 (in million tons)**



Source: Ministry of equipment and transport

Seeking the improvement of rail transport performance led to the conclusion of a new program-contract with the State over the period 2010-2014. This program-contract incurs an amount of 33 billion dirhams, 20 billion of which will be devoted to HST project. The remaining 13 billion will be used to funding the ongoing modernization of the current railroad network. The new line will play a significant role in the economic momentum of the country by linking the economic metropolis with the city of Tangier; this would make it possible to vacate the traditional line of the passenger traffic to be used for the transit of goods.

The 2010-2014 Program-contract focuses on the following two lines:

- The development of the railway transport sector by means of private initiative through the implementation of Public-Private Partnership, and transfer with regard to the construction and operation of the railway infrastructures, on the one hand;
- The increase in the competitiveness of railway transport which lies within the scope of the transport policy aiming at improving the quality and reducing the costs of customer services, ensuring that customers cover the operating expenses of the transport services and infrastructure charges, on the other hand.

This program-contract is an outcome of the restructuring of the institutional framework following the adoption of Act n°52.03 establishing the National Office of Railroads into the Moroccan Railways Company. ONCF is then preparing for its future phase of development by engaging into a number of projects aiming at the renewal of the railways as well as the extension or doubling up of others.

Rail transport is also the main channel for the transit of phosphates. It offers significant advantages over other modes of transport of goods. Such merits can be summed up in energy saving, protection of the environment, safety of transport and relieving traffic congestion on major roads. In this regard a new "Freight Strategy" has been launched by ONCF, aiming at carrying more traffic, up from 8 million to 18 million tons, as well as positioning itself in the container logistics by ensuring the transport of 100.000 containers by rail and processing 300.000 containers in dry ports, all by the year 2015. This strategy is based on four pillars:

- Accelerating the development of sectoral logistical plans: cereals and oil;
- Quickly exploiting the traffic potential of new services of Tanger Med and Nador;
- Increasing the rail traffic share in the ports of Casablanca, Safi and Jorf Lasfar;
- Building and operating a network of intermodal container terminals (dry ports) and developing nearby areas of logistics activities.

### **3. Evaluation of the macroeconomic impacts of transport reform**

The main actions undertaken to reform the sector seek to upgrade the competitive edge of the sector. It seems worthwhile to study the impact of the achievement of these goals on the transport sector as well as their impacts on the rest of the components of the national economy. This evaluation was performed through the use of a two sectors computable general equilibrium model<sup>11</sup>, a reformed sector (transport), and another sector that comprises all other sectors (the rest of the economy), by means of two simulations. The first accounts for the fall in the markup (increase of competitive intensity) of 5% due to the implementation of reforms, while the second, more optimistic, banks on a 10% decline. Such decreases reflect the improvement of the sector competitiveness.

The first simulation (Table 4, column 3) shows that a decrease of 5% in the markup leads to an increase of the production of the transport sector by 3.4% and that of the rest of the economy by 1.0% reflecting the importance of the sector in relation to the national economy. At the macroeconomic level, GDP would increase by 0.8% in value,

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<sup>11</sup>See Appendix 2

employment by 0.9% and capital by 1.2%.

The decrease in the markup would also lead to an increase in household final consumption in both sectors ( $c_1 = 1.0\%$  and  $c_2 = 0.4\%$ ), as well as the consumption of companies in production factors ( $l_1 = 0.8\%$  and  $k_1 = 1.1\%$ ) and ( $l_2 = 3.2\%$  and  $k_2 = 3.2\%$ ). Similarly, this simulation shows that capital would increase faster than labor in the economy except transport, while in the reformed sector the decrease in the markup has the same effect on the two factors, which means that the transport sector is labor and capital-intensive with the same proportion.

**Table 4: Changes of the variables following the decrease in the markup of 5% and 10%**



Variable	Symbol	Value	
Markup (competing intensity)	$\mu$	-5%	-10%
<b>Economy</b>			
GDP	Pib	0,8%	1,5%
Capital		1,2%	2,4%
Labor	l	0,9%	1,9%
Nominal wage rate	w	0,4%	0,7%
Final consumption	C	3,5%	7,1%
Price of consumer goods	$p_c$	-1,1%	-2,1%
<b>Sector 1:Economy (except transport)</b>			
Production	$y_1$	1,0%	2,1%
Final consumption	$c_1$	1,0%	2,0%
Capital	$k_1$	1,1%	2,2%
Labor	$i_1$	0,8%	1,6%
Intermediate consumption	$z_1$	1,1%	2,2%
Intermediate consumption of good 1	$z_{1.1}$	1,0%	2,1%
Intermediate consumption of good 2	$z_{2.1}$	3,3%	6,9%
Price of aggregate intermediate consumption	$p_{z1}$	-0,2%	-0,4%
Temporary production	$y_{z1}$	1,0%	2,0%
Price of temporary goods	$p_{z1}$	0,1%	0,3%
<b>Sector 2:Transport</b>			
Production	$y_2$	3,4%	7,1%
Final consumption	$c_2$	0,4%	0,9%
Capital	$k_2$	3,2%	6,7%
Labor	$i_2$	3,2%	6,6%
Intermediate consumption	$z_2$	3,6%	7,5%
Intermediate consumption of goods 1	$z_{1.2}$	3,4%	7,1%
Intermediate consumption of goods 2	$z_{2.2}$	4,4%	9,2%
Price of aggregate intermediate consumption	$p_{z.2}$	-1,2%	-0,3%
Added-value	$y_{T2}$	3,2%	6,7%
Price of added-value	$p_{T2}$	0,1%	0,3%
Price	$p_2$	-5,5%	-11,0%

Source: DSFF.



With the fall of markup in the transport sector, intermediate consumption increases equally in both sectors ( $z_1=1,1\%$  and  $z_2=3,6\%$ ) and for the two goods [sector 1:( $z_{1,1}= 1,0\%$  and  $z_{2,1}= 3,3\%$ ) and sector 2:( $z_{1,2}= 3,4\%$  and  $z_{2,2}= 4,4\%$ )].

The increase of production (of both sectors) results in a fall in the prices of final consumer goods ( $p_c= -1.1\%$ ) and transport ( $p_2 = -5.5\%$ ), that is a decrease more significant than that of the markup, because of the ratchet effect of intermediate consumption price ( $p_{z1}=-0.2\%$  and  $p_{z2}=-1.2\%$ ).

Concerning the simulation of a 10% markup fall, the effect has almost doubled with a more significant increase of GDP standing at 1.5%, 1.9% in labor with a rise of wages of 0.7%, and a rise of the final household consumption of approximately 7.1%.

## ***Conclusion***

The sector of transport, especially that of goods, is particularly important for the economic momentum. Its importance arises partly from its contribution to the operation of the market of goods and production factors, and partly from its contribution to the improvement of the macroeconomic variables. The high costs of transport weigh heavily on the expenditure of companies as well as consumers, affecting the competitiveness of national companies abroad and reducing the attractiveness of the country for FDI.

The sector of the transport of goods in Morocco suffers from several difficulties which hinder its integrated development. The main obstacles are related to the organization of the profession, the relative insufficiency of infrastructure in some of its components, and the delay with regard to logistic services.

The actions undertaken by the public authorities aim at modernizing and rehabilitating such sector, through the improvement of the profession organization and operation in order to enhance its competitiveness standard. Significant advances have been accomplished. They related to the development of infrastructure which proves to be of paramount importance. Therefore, major projects were implemented to solve the insufficiency problem in various transport networks in order to ensure a broad coverage and better connectivity of the various regions of the Kingdom. The investment effort undertaken in transport infrastructure was consolidated over the period 2007-2013, which made it possible for Morocco to position itself against its main competitors of North Africa.

With regard to road transport of goods, a major component of the economic system which suffers from the preponderance of informal activities, the new tax provisions aiming at lowering corporate tax for small businesses could be profitable for the integration of a significant part of informal activities into the formal sector by means of targeted support actions.

Concerning rail transport, ONCF should accelerate its managerial strategies targeting the diversification of customers and products. Indeed, the public authorities show a considerable support to rail freight transport, by including it in the new logistic vision as being a true catalyst for the development of logistic services via multimode platforms.

Concerning sea transport, it should be noted that the new port Tangier Med constitutes a significant breakthrough as to port infrastructure, as well as the logistic services.

It will make it possible to better exploit the opportunities offered by the strategic geographical position close to Europe, by a diversification of industrial activities (the traffics of containers, bulk, roll-on/roll-off, various goods), and by know-how with regard to logistic services of the various international actors already operating. The development of maritime transport companies to meet the national challenges of competition could significantly contribute to the achievement of the expected objectives, especially with regard to regional and international market positioning.

The reforms initiated in each segment of the sector of the transport of goods will aim at reducing the impact of the monopoly situations and establishing more competitiveness to upgrade its productivity as well as the standard of other industries. The analysis of the macroeconomic impacts of the transport sector reform showed that the increase of competition intensity in the transport sector and, consequently, the fall of the markup (- 5%) involve positive effects on both the reformed sector and the other economy sectors, in terms of national production (+0.8% of GDP) and employment (+0.9%).

A more ambitious endeavor could be posted, through the fall of the markup by 10%, with better effects in line with the employment and growth targets, for which Morocco has the right to expect a significant mobilization around such a crucial and strategic issue for the future of a country convinced of the benefits of the openness onto itself (its regions) and onto the rest of the world.

## Appendices

### Appendix 1: Method of estimating markups

The markup (or margin factor) is evaluated for each sector by using the method developed by Roeger (1995). The marginal cost of a firm can be expressed as follows:

$$C_m = \frac{W\Delta L + R\Delta K}{\Delta Q - \theta Q}$$

Where Q is the added-value (real), W stands for "wage", R "capital cost" and  $\theta$  "technological progress rate".

This expression can be rewritten as:

$$\Delta q = \Delta l \frac{WL}{C_m \cdot Q} + \frac{RK}{C_m \cdot Q} + \theta$$

Variables in small case letters represent logarithms. When the economies of scale are constant, the capital and labor shares in the added-value equal 1.

The factor of margin is defined by the relation between the price of the added-value P and

marginal cost noting that  $\alpha = WL / P \cdot Q$

$$\mu = \frac{P}{C_m}$$

we get :  $\Delta q = \mu \alpha \Delta l + (1 - \mu \alpha) \Delta K + \theta$

Subtracting  $\alpha(\Delta l - \Delta K)$  of both sides of the equation and rearranging, we get the Solow residual:

$$SR = \Delta q - \alpha \Delta l - (1 - \alpha) \Delta K = (\mu - 1) \alpha (\Delta l - \Delta K) + \theta$$

In a situation of perfect competition ( $\mu = 1$ ), Solow residual is independent of the growth rate of the capital /labor ratio and is equal to the rate of technological progress  $\theta$ . In reality, this property, known under the name of invariance property of Solow residual, is not observed. Indeed, the Solow residual measured during the time of expansion is higher than the residual observed in the years of recession, probably because of the violation of the perfect competition theory ( $\mu > 1$ ).

The markup is connected to Lerner index noted as  $\beta$  in the expression:

$$\mu = \frac{1}{1 - \beta}$$

The Solow residual is rewritten as:

$$SR = \Delta q - \alpha \Delta l - (1 - \alpha) \Delta K = \beta (\Delta q - \Delta K) + (1 - \beta) \theta$$

In perfect competition ( $\beta = 0$ ), the Solow residual is equal to the rate of technological progress. Roeger (1995) indicates that an equivalent expression can be obtained for a Solow residual based on prices.

$$SRP = \alpha \Delta w + (1 - \alpha) \Delta r - \Delta p = \beta (\Delta q - \Delta r) + (1 - \beta) \theta$$

Subtracting SRP from SR and adding a error term, we obtain an expression allowing the estimation of  $\beta$

$$\Delta y = \beta \Delta x + \varepsilon_t$$

Where

$$\Delta y = (\Delta q + \Delta p) - \alpha (\Delta l + \Delta w) - (1 - \alpha) (\Delta k + \Delta r)$$

is the growth rate of the nominal Solow residual and

$$\Delta x = (\Delta q + \Delta p) - (\Delta k + \Delta r)$$

is the growth rate of the nominal production /capital ratio. III

The interest of this method is that the prices and volumes can be grouped so that only nominal variables are necessary for the estimation.

It is possible to extend the approach by incorporating intermediate consumptions. In this case, the markup is defined as the ratio between the marginal cost and production price, and no longer the price of added-value. The dependant

variable and the explanatory variables become:

$$\Delta y_{\text{prod}} = \Delta q_{\text{prod}} + \Delta p_{\text{prod}} - \alpha_{\text{prod}} (\Delta l + \Delta w) - \beta_{\text{prod}} (\Delta n + \Delta p_{\text{ci}}) - (1 - \alpha_{\text{prod}} - \beta_{\text{prod}}) (\Delta k + \Delta r)$$

$$\Delta x_{\text{prod}} = \Delta q_{\text{prod}} + \Delta p_{\text{prod}} - (\Delta k + \Delta r)$$

Where

$q_{\text{prod}}$  = log (production)

$p_{\text{prod}}$  = log (production deflator)

$\alpha_{\text{prod}}$  = share of labor in production

$l$  = log (employment),

$w$  = log (wage),

$n$  = log (intermediate consumptions),

$p_{\text{ci}}$  = log(intermediate consumer prices)

$\beta_{\text{prod}}$  = Share of intermediate consumption in production,

$k$  = log (capital stock),

$r$  = log (capital cost).

**Table 5: Estimated Lerner indices**

<b>Sector</b>	<b>Lerner index</b>	<b>t-stat</b>
Products of agriculture, hunting and related services	, 067	2,132
Fishery and aquaculture products	, 21 5	10,042
Mining industry products	, 526	5,853
Food industry and tobacco	, 374	5,116
Textile and leather Industry	, 121	3,985
Chemical and para-chemical industry	, 159	4,483
Engineering, steel and electrical industry	, 148	2,262
Other manufacturing industries	, 280	4,022
Refining of oil and other energy products	, 203	1,887
Electricity and water	, 1 51	5,243
Construction and public works	, 207	4,679
Trade	, 234	4,753
Hotels and restaurants	, 140	3,239
Transport	, 250	7,058
Post and telecommunications	, 288	2,835
Financial and insurance activities	, 21 7	4,980
Real estate, renting and services to companies	, 420	7,108
Education, health and social action	, 235	2,039
General public administration and social security	, 1 63	1,957
Other non financial services	, 1 62	2,902
Total	, 259	3,180

Source: DSFF

Reading: the transport sector has a Lerner index estimated at 0.250 over the period 1998-2009.

## Appendix 2: Presentation of the model

A Computable General Equilibrium Model (CGE) is a system of equations simulating the operation of a market economy. It consists in simultaneously determining the prices and the quantities of products and productive factors in all markets (General), which ensure the equality of supply and demand (Equilibrium). The calculation of the parameters of this system is conducted using the Social Accounting Matrix (SAM)<sup>12</sup> which contains all the necessary information for the calibration of the model<sup>13</sup> on the economy under consideration (Computable).

CGE is used to evaluate policy impacts and macroeconomic shocks by simulating the operation of the markets of goods and factors and capturing the interactions between production and employment structures, incomes of production factors, distribution of incomes to the individuals and households and the structure of demand. However, it cannot carry out any projections.

For the purposes of the present analysis, it is based on a two-sector equilibrium model, since it is best adapted to evaluate the macroeconomic impacts of sectoral reforms. Therefore, the economy is divided into two sectors: a small reformed sector (transport in this case), and another sector which includes all the other sectors (the rest of the economy). The main benefit of this model lies in its flexibility. It is, indeed, possible to study the effects on the entire economy of a reform in any sector by only modifying the calibration parameters values of the model. It makes it particularly possible to study the long-term effects on the economy of an increase in competition (decrease of company margin) in the reformed sector.

To evaluate the impact of the pro-competitive reform of the sector of transport, we

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<sup>12</sup>System of national accounts 1993 defines the social accounting matrix as a tool making it possible to present the accounts of the system of national accounts in a matrix format which develops the interrelationships between the supply and use table and the accounts of institutional sectors; an orientation characteristic of a social accounting matrix is to highlight the role of individuals in the economy, and can be translated, in particular, by additional breakdowns of the households sector and a detailed representation of the labor market, distinguishing, for example, the various categories of employed labor force.

<sup>13</sup>Calibration of CGE model to a given economy is the process of estimation of free parameters of the functions of behavior of agents in order to duplicate the values of social accounting matrix.



consider a two-sector economy, closed with no State activity. These two sectors consist of a considerable number of companies operating in monopolistic competition. The following hypotheses are made:

- There are three factors of production: capital, labor, and intermediate consumption;
- The two factors (capital, labor) are supposed to be mobile between the two sectors;
- As the capital factor is produced only by the sector of "rest of the economy", capital price is constant.
- Each sector produces a product. The first (the rest of the economy) produces an investment good, taken as cash, which is also used as final investment good for households and intermediate good for the companies of the two sectors. The reformed sector (transport), on the other hand, produces a good used as intermediate consumption by companies and as final goods by households.
- No money is introduced into the model because only long-term adjustments to structural reforms are studied.

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