Maritime Transport Regulation: The Case of Cabo Verde

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Abstract

Due to the globalization phenomenon that the world faces nowadays, the maritime, land and air transports together play an important role on the development of any economy. In particular, the maritime transport is crucial to island countries, such as Cabo Verde. The unavailability of appropriate infrastructure, the inexistence of scheduled timetables are, among others, some of the examples of shortcomings that affect the country's performance and everyday life of the users of these services. Budgetary constraints that have led to the establishment of other priorities for the public sector have conducted the country to the present penurious status of the maritime transport sector. The maritime transport service, for the role it plays in social and economic development of the country, such as cohesion and unity, calls for significant and urgent improvements. An important step was taken in the beginning of the 21st century, with the liberalization of the service. However, appropriate regulatory measures did not follow-up, rendering still a poor and low quality service, in particularly, in the unprofitable inter-island service. This situation cannot be allowed to continue as such, meaning that the Government of Cabo Verde should intervene in order to ensure the basic needs of transport to its populations, in the name of the integration and much needed development. The economic and social regulation of maritime transport service in Cabo Verde is important and should therefore be pursued, as soon as possible, in order to reduce or eliminate existing market failures. It is with this purpose that this paper proposes to implement a regulatory model which serves the interests of the people and of the country, and guarantees that general economic interests will not be further compromised.

Keywords: Economic and Social Regulation; Price Cap Regulation; Maritime Transport Service; Cabo Verde; Island Countries; Törnqvist Index

1. Introduction

The Transportation systems are important drivers of the worldwide economy, play a crucial role in the exchange of goods and human flows across and between countries, regions and continents. Territorial discontinuities have been generating demand for transportation services and, in particularly, maritime transportation systems have been key elements in achieving a true globalized supply chain and production distribution systems for major companies contributing to the worldwide economic growth. In addition, maritime transport systems have successfully made for the peoples' needs, especially when it comes to remote or insular territories.

Cabo Verde which is an insular and archipelagic country in Western Africa (10 islands) heavily relies on good maritime transport systems to mainly: i) ensure international trade (imports and exports) and national trade between islands; ii) provide travel services to Cabo Verde's business people. In essence, maritime transportation services in Cabo Verde works to diminish the negative externalities arising from the country's geographic conditions.

Currently, with the exception of some links between some islands, where the demand is higher, the shipping service to most islands is not subject to a set frequency and schedule, which puts in the limelight the need to optimize the transportation services and secure the peoples' needs. Currently, Cabo Verde's transportation services are inefficient, leaving room for its improvement.

In order to overcome the identified market failures, this paper proposes a new regulation framework that aims to improve the existing model leading to a much-needed better public service.

The remainder of the paper is organized as follows: section 2 describes maritime transportation and introduces some ports' management models; section 3 outlines the key objectives of regulation and reviews the existing regulation models; subsequently, section 4 depicts the *as-is* transportation panorama in Cabo Verde, with a closer look at the maritime transportation in the country; section 5 encompasses a comparative analysis between Cabo Verde and similar geographies (e.g. Azores islands) in the view of setting the key

guidelines that shall be taken into account when designing the maritime regulatory model for Cabo Verde; section 6 presents the proposed regulatory model for Cabo Verde and section 7 ends the paper with a discussion of the conclusions and perspectives for the sector in Cabo Verde.

2. Transport sector: maritime transport

The flow of people and goods have been in existence since the beginning of humankind, and they have constituted the main–driver for the development of transportation systems (Greene & Wegener, 1997). In fact, getting across the oceans and travelling long distances within continents, for the sake of the exchange of goods, will always be generating flows that require the development of suitable and effective transportation systems. Despite major technology disruptions occurred in the last century, maritime transport will continue to play a crucial role in bridging gaps whether in leveraging the international trade of goods and raw materials between continents and markets, or mitigating the insularity phenomena in some countries.

Maritime transport

A myriad of regional, national and players such as port companies, maritime authorities, and freighters, among others, makes the maritime net system worldwide. In the case of Cabo Verde, due to its geographical fragmentation and discontinuity this industry importance is vital. Cabo Verde has about 4.000 square kilometers, fractioned in ten islands, with an Economic Exclusive Zone 160 times bigger than its territorial land.

Building an effective maritime infrastructure in a country like Cabo Verde is expensive. Each island requires its own port and other complementary infrastructures. Port infrastructures comprehend a set of other structures, such as piers, docks and spaces for vessels berth, cargo and containers storage and passengers transit, generally part of a more general sea and land infrastructures. Maritime areas are the channels and the space necessary for the movement of ships and, land areas are those enabling connections for multi-modal transportation such as road and rail transportation (Trujillo & Nombela, 1999; World Bank, 2000).

Port authorities

According to the World Bank (2000, 2007) and Verhoeven (2010), Port Authority is a public or private entity, responsible for the management, security, administration and control of the activities in the port infrastructures and within the port premises. Traditionally, port authorities had a triple mission: i) regulate the port; ii) operate the port; iii) own the port. Nowadays, due to liberalization wave and consequent changes in regulation, these roles are played by distinct entities

The owner of the port, usually a public entity, is responsible for investing in basic infrastructures (e.g. docks, quays, storage and marshalling areas) and in super-structures (e.g. gantry cranes, offices). Normally, due to budget constraints, they do not have enough financial resources to extend and modernize port infrastructures to cope with the market trends and customer demands.

Port regulators supervise the port activities and enforce the law (e.g. ensure that port operations respects the health and safety security policies and standards) (Verhoeven, 2010; World Bank; 2007), establish port tariffs and devise policies for the port operators.

Finally, the port operators provide logistics and services to the passengers, such as cargo *handling*, tug services, pilot services, among others (Verhoeven, 2010; World Bank; 2007).

In the past recent years, in order to mitigate the lack of financial resources to invest in port infrastructures, public entities have been establishing PPP (Public Private Partnerships) that allow the private sector to take over on these obligations. In these cases, both, the public and private entities share risks and investments.

Port management models

Usually, depending on their purpose, location, socioeconomic structure of the country, nature of cargo, and also political ideologies, there are four different types of port management models, that being: i) landlord port; ii) tool port; iii) public service port; iv) fully privatized port (World Bank 2000, 2007).

Landlord ports are those whose management and regulations are taken over by the port authority. In this case, the port authority owns infrastructures and private entities provide the port services and own the super structures. Typically, this model is adopted by medium and large ports (e.g. Rotterdam, Buenos Aires).

In the case of the tool ports, the public authorities are responsible for the port regulation and they own the infrastructures and the super structures. Private entities are granted concessions and licenses enabling them to service the clients. Since the public entity supplies the equipment and infrastructures, based on the real demand needs, this optimizes the purchase of equipment and infrastructures and hinders unnecessary spending. Example of port using this model are Chitatong in Bangladesh, Seattle in USA and Antwerp in Belgium (World Bank, 2007).

Public service ports are those whose authorities have an end-to-end responsibility, from management to port regulation and services provision. The port authorities

(Nigra, 2010; World Bank, 2000, 2007) also hold the infrastructure and superstructures.

Fully privatized port is the opposite of the public service ports (Verhoeven, 2010; World Bank, 2007). Some advantages of this model are greater financial capacity that private entities have for the purpose of making modernization and expansion investments, without the government having to interfere on the decision making (World Bank, 2007). The disadvantages may be the need to create regulatory agencies to monitor the behavior of the private entity and the risks of private land speculation (World Bank, 2007).

3. Need for regulation of the transport sector

During the last decade of the 20th century management and transport services that had been executed by the public sector were liberalized. As a consequence, there has been a significant increase in the involvement of private investors in this area (Estache, 1999). This fact consubstantiated a paradigm shift, with new needs and which has led to the necessity to raise regulators organically and functionally independent to perform the functions previously performed by governments (World Bank, 2000).

The regulation concept

The concept of regulation underlies three different theories:

- **Theory of Public Interest** – Under this theory, the principal objective of the government, as regulator, is to correct and minimize failures and other market imperfections which constraints the market from performing as a true free market and to maximize the social wellbeing of the consumers (Marques, 2005; Soares, 2007). Some market deficiencies, constricting the market from performing as a free market are, among others, positive or negatives externalities, monopoly power, and information asymmetries (Button, 2010; Marques, 2005; Soares, 2007), which will be further discussed ahead.

- **Theory of the Groups of Interests** – In the case here set forth, past studies have concluded that, contrarily to what has been defended by the neoclassical concept, regulation is done in favor of companies. This, in itself, originates the theory of the groups of interests. It has also been demonstrated, contrarily to what has been defended by the *Nirvana Approach* of Demsetz, that regulation (built on the foundations that and institution can, theoretically and efficiently, substitute and correct imperfections) does not reduce prices substantially nor does it eliminate price discriminations or increase production volumes (Marques, 2005; Soares, 2007).

- **Theory of Public Choice** – In this case, the theory postulates that regulation shall be used to minimize Government failures and not market failures (Marques, 2005; Pereira, 1997). It defends that Governments are the only agents that hold decision powers on the politics for, and among others, proprietary rights over certain resources, concessions, licenses, quotas, and import tariffs.

Methods of Economic Regulation

Economic regulation, when one analyses the purpose, which it serves, consists on balancing tariffs and prices that can be considered appropriate for the consumers and for the regulated entity.

The methods of Economic Regulation, which can yield such a result, according to Marques (2005), divide in two main groups. The first of the group is the one based on the method by establishing a certain fixed rate (RTR), and the second one by the method based on performance incentives (RID).

Regulation by a Fixed Rate

Also known as regulation by the cost of service, it is the method where the regulating entity restricts the revenues of the regulated entity by fixing the margin rate through which it should recuperate the invested capital and cover for the cost of production of the service or good supplied (Marques, 2005; Soares, 2007; Train, 1991). From Marques view (2005) and other authors, this allows not only for the applicability of the already known second choice linear prices of Ramsey-Boiteaux, but also for the non-linear prices.

If the above can be considered an advantage from the application of the RTR method, its principal disadvantage resides on the Averch-Johnson (A-J effect) effect it creates. The A-J effect hypothesizes that companies tend to invest in capital more than what is necessary with the deliberate intent to increase remuneration, in detriment of implementing technical progresses (Marques, 2005; Soares, 2007; Train, 1991), which could minimize that same remuneration and, consequently, the costs.

Regulation by Performance Incentives

The second group of the economic regulation method, the RID, is, by its own turn, subdivided into 1) price cap regulation (RCP), 2) revenue limitation regulation (RLR) and 3) comparison regulation (RC) (Marques, 2005).

- Price Cap Regulation

Is the method most used in the infrastructures sector and, for these reason, it is the one which is subject to a wider analysis by scholar of these theories. It consists in the fixation of a price ceiling that one regulated entity applies during a defined previously agreed time period,

which normally lags between 3 and 6 years. This regulation method came up as a means of mitigating the disadvantages of the RTR method, building on the incentives to promote efficiency and inovation, namely by cuttig production costs, reducing the powers of the monopoly and the X-ineficiency costs (Button, 2010; Marques, 2005; Soares, 2007). These ineficiencies normaly occur in companies which have strong market powers, and normally come from the fact that they are not subject to pressures from other competitors to operate at lower costs.

The maximum price to operate is normally given by the formula (Glass, Stefanova, & Sysuyev, 2013; Marques, 2005; Soares, 2007):

$$P_{i,t} = P_{i,t-1} \times (1 + \frac{I_{i,t,t-1} - X_{i,t,t-1}}{100})$$

Equation 1: Price Cap regulation

Where:

$P_{i,t}$ is the maximum price that one can practice on the service or product *i* during time *t;*

$P_{i,t-1}$ is the price practice during time t-1 on the product or service i;

$I_{i,t,t-1}$ is the Consumer Price Index (IPC) corresponding to the service i, between period t and t-1. The IPC measures the general level of inflation, as it is considered the final price;

$X_{i,t,t-1}$ is the factor of productivity gain to produce service or product i during the period of time t and t-1. It corresponds to the variations in productivity (dinamic efficiency, static and allocative inputs and outputs). This factor is defined in the beginnng of each regulating period and kept constant throughgout the period. The cost of the service is inversely proportional to the value of productivity variation, therefore, the lower this one is, the highest the other is.

The efficiency factor can be calculated through various methods, of which one can evidence:

1) **the method of Discounted *Cash-Flow*** – through the cash-flow of the regulated entity it is predicted alternative cenarios for variable revenues and expenses and sensibility analysis;

2) **the method of Total Prductivity of Factors** (PTF) – an approach of the type backward looking, this method utilises historical productivity data to predict future gains. Whilst threre exists various indices for its determination, the most utilized are the parametric and non-parametric methods of Malmquist and Tornqvist, (Ondrej & Jiri, 2012) and benchamarking analysis. Examples of parametric methods are the least square minimums, known in english as Ordinary Least Squares, and the corrected least squares, known as Corrected Ordinary Least Square and Stochastic Frontier Analysis. Examples of non-parametric methods are Data Envolvement Analysis and index numbers (Marques, 2005).

4. Cabo Verde and the Transport Sector

Cabo Verde is a small archipelago country made up of 10 islands and many other islets of which nine are inhabited. Due to the insular geography and low production capacity, importing almost all of its consumption needs, the requirement for transport infrastructures is greater than most countries. It is a fundamental necessity for the country to invest in transport infrastructures, namely, ports, airports and roads, at least in all major islands. These will all add to the cost of the development already reflecting high levels of debt, calculated at about 13% of its PIB.

All islands are served with ports and can receive international traffic, except for the Porto Inglês in the island of Maio, which does not have a customs authority. Some ports are restricted by their reduced depth, limiting the type and number of boats that they can receive or are affected by other natural restrictive sea factors rendering them useless during rough sea periods.

Maritime Transport in Cabo Verde

In spite of the potential, historically recognized for the country in this sector, one of the most important obstacles it faces, in its development process is, still, a precarious maritime transport system. Inefficiencies that should have been already solved, have not been taken care of neither by the government, nor by the private sector, thus compromising its development. More conscious of the situation, the Government has now been investing in the modernization and expansion of maritime transport and port infrastructures. An example is the intervention in the private company Fast Ferry, by becoming a shareholder, an effort made to save the company from bankruptcy.

Procedures for boarding and disembarking of passengers and cargo are almost inexistent. There are cases where it is the passengers that load and unload their own baggage and other cargo on board, which causes disorder, discomfort, and inefficiencies on the transporting processes. There are no logistics within the system.

As it happens for passengers, the owner of the ship also performs logistics for cargo transport. There are no freight forwarder operators on the national transport system for cargo reception in the loading port and subsequent delivery to the recipient in the destination port. The lack of freight forwarders is associated with the absence of necessary conditions, such as guaranty of sufficient and critical volume of goods, for the development of such logistical structures. The majority

of existing national routes are not regulated and the service varies as function of demand.

Maritime Transport Regulation in Cabo Verde

Two periods mark the regulatory framework of the maritime transport in Cabo Verde. The first period marked by the years up to the late 90's and the second from the beginning of the century up to the current date. This period has been followed by the market liberalization, after the privatization of the state National Navigation Company, E. P., better known as Arca Verde, in 1999.

In December 2013, while in a process of rationalization of existing structures (by use of synergies), it was given birth to an public regulating entity, under Government Law nº 49/2013, dated December 4th, with the objective of regulating the maritime and port sector, in substitution of its predecessor Agência Marítima e Portuária (AMP). This new structure comprises the powers of economic regulation, previously under the responsibilities of Agência de Regulação Económica (ARE), and also, carries the functions of technical regulation of the maritime and port sector.

Mandatory Public Service

The inter-islands connecting lines, are non-profitable, and considered not to be unattractive for the private sector, have to be secured by the Government as they serve the purpose of providing for coverage of basic needs of transport and stimulate the dynamics of the economy. To solve this problem, Government established the Law n.º 21/2004, of May 31st which institutes that rendering public maritime transport services should be performed by concession, under the principles of universality, equality, continuity, regularity and price accessibility for all citizens or people using the services.

The concession for both goods and passengers, have been brought into law by the Government Law n. º 24/2004, of June 7th, with the powers to concede the lines given to the ministry responsible for the maritime transport sector. Contracts conditions can be for one year, renewed for an equal period, under the circumstances that the service quality has been evaluated as good. In the case where there is interest from other companies, a new tender should be put out for a new contract based on competition between the interested parties.

None of the Laws mentioned above have been implemented, according to interviews with people from the Ministry of Transport and Infrastructures. In spite of the obligation of the Government in providing and guaranteeing an inter-island maritime transport service, there has been no tender yet for a first concession. Currently, the contracts in effect between the Government and privates are directed to securing minimum services in some routes.

Quality of Services and Sanctions enforcement

Quality inspection of the maritime service rendered by companies, as per law nº 21/2004, belonged to ARE up to the time that AMP was created. Information collected from ARE, through interviews, yields that, even in the case of non-profitable routes, it has never exerted the powers it has over tariffs, or for the quality of service, due to the cause that there had never been a public tender for the concession and contracting of any itineraries. Even though, this is a fact, ARE never embraced this sector with as much diligence as it did for other regulated sectors such as, the electricity, water and fuels or the road transportation.

As such, there is no quality control being done on the ships, leaving the consumers injured on their interests. The real situation is no different than if there existed no legal entity to control or no place where a harmed consumer, abused in its rights, can direct his claim. Intrinsically, in spite of the fact that the law predicts sanctions, per type of offense committed, they are not enforced because, even if consumers claim for a harm, there are no entities that can evaluate and deliberate on the claim and apply sanctions if appropriate. Not even the AMP recently created is equipped with capacitated personnel, and sufficient in numbers, to exert the powers it has been committed on enforcing the regulations of the quality of services in maritime transport.

Establishment of prices and tariffs

The current system of prices and tariffs, for the maritime transport of goods, is regulated by law nº19/2006. Even though not much more than a mere update exercise of the tariffs previously fixed, this system fixes a maximum price that can be practiced as it is established under law nº 21/2004. The tariffs, which have not been updated, for over nine years, do not include provision for bulk or liquid cargo, container cargo, all of which are goods transported locally.

As it happens for goods, tarifs for passengers are fixed on a distance and type of ship basis, depending if it is a conventional or high-velocity type vessel. There is no distinctions made by age and they cannot exceed those established under the decision nº 10/2012, as per the law nº21/2004. In general tariffs are indexed to the cost of fuels and inflation. For very long time tariffs were frozen because during the time, the price of fuel had been fixed by the government and variation was almost null.

Due to lack of control by the AMP, ship-owners do not always respect the cap limits on the tariffs for the transport of passengers. As previously stated, lack of enough capacity, including human, is responsible for

this situation. The CVFF is the only ship-owner company that respects and enforces the legally fixed prices, understandably because they are the only ones that have a contract with the authorities.

5. Transport Maritime Regulation in other island realities

In order to find the best regulation method that could serve the needs of Cabo Verde, a comparison procedure, having as a basis the Mandatory Public Service quality control, sanctions applied, establishment of tariffs, in other insular and archipelagic realities, such as the Canary Islands and the Azores, were made. These two realities, in spite of the existing development differences, can be taken as comparable to the Cabo Verde reality. Let's now analyze what these realities have to offer in their basic concepts of the service provided, prices and tariffs and quality control.

Classifying the Regulation Model

The maritime service market is free in both archipelagos of the Azores and the Canary Islands, since the publication of the regulation nº 3577/92, of December 7th, of the Economic Community (CEE). In both, the public service in defined routes is mandatory and imposed by the Government as a means of guaranteeing social equity and cohesion, while providing to the population equal access opportunity to a necessary service, over which the Government has obligations.

Given the information available, the OSP in the Canary Islands follows two models, while in the Azores it follows only one model. The models in the Canary Islands are: 1) the regime requires previous authorization and, 2) a public contract for OSP is also required. These models essentially differ between themselves by the exclusivity regime, or not, used for the operation on the routes do not, under normal conditions, generate profits. Resourcing to public contracts occurs when the regime of previous authorization has been deserted for lack of interest.

In the case of Azores, the OSP are generally done through a general economic interest service management contract. This contract concedes to one and only one company management and concessionary powers for the transport of passengers and vehicles. The transports of goods do not need such an imposition as the volume justifies the feasibility of the transport. This model differs from that of the Canary Islands by the fact that it is the Government that is responsible for the concession of the maritime transport. Normally operated by the Atlânticoline, S.A, in the Azores, the passenger transportation is subsidized, specially, on the islands of the triangle which have less traffic and economic activity.

In the Canary Islands the Government is responsible for defining the routes, as they may be needed. This is the way they have found to guarantee the regularity of the inter-island maritime transport, independently of the volume of flux that they can generate. The same thing happens in the Azores, with a particularity for the fact that there, the Regional Government, through the above referred public services interest management contract, concedes to one and only one company, the Atlânticoline S. A., the service for the transport of passengers and vehicles within the archipelago.

Quality Control and Sanctions Application

The quality of service, along with its valuation by the users, is essential in a free and competitive market situation, particularly in the less competitive markets, where there is only one operator, and the temptation to reduce the quality of the service as a means of increasing its profit margin is a reality.

In the Canary Islands controlling the quality of service lays with the entity responsible for the maritime transport service. The literature available does not specify the metrics used for the control of the level of the services. In the Azores, however, for the maritime transport of passengers and vehicles, the responsibility to control the quality of the service is also given to Atlânticoline S.A.

In the Azores, the AMT, for the purpose of giving information to the consumers, publishes, every six months, the performance statistics of each company in service. This is considered a very effective means of stimulating, promoting and controlling the quality of service. On the contrary, in the Canaries, there is no obligation to publicize the performance of the companies in the maritime service.

Establishing Prices and Tariffs

While in the Canary Islands a system of subsidy for the residents is used through a discount on price, in the Azores the price is fixed for all users, also subsidized through a system that controls the commercial plan of the operator.

As above mentioned, in the Autonomous Region of the Azores, the control is made by the Government through the commercial plan presented by the operating company up to the 31st of December, of the preceding year to the year of operation. It is prohibited to deliberate about this matter during any other time while, in the Canaries, the responsible entity may intervene at its own discretion, at any moment.

In general, the two realities have developed a regulatory system which brings about some sort of mandatory public service for regions that cannot generate enough traffic to operate as a free market. They have also adopted a system of subsidy which best fits the reality

of each one, and a controlling system which imposes a minimum quality of service to be given to the consumers.

6. Regulation Model for the Internal Transport Service in Cabo Verde

It is a known fact by all involved that the system in use in Cabo Verde is precarious and inadequate for the actual necessities of the archipelago. It is, therefore, imperative to push the development of the sector of transport which affects the day-to-day user and hinders the development of the country. It is considered, for this purpose, necessary and urgent that a regulatory system for the internal maritime transport service be implemented, as it has been thought for quite a long time. The country needs to unite its territory, to promote its develop and to strengthen its internal commerce and movement of people.

(acho que deves incluir aqui um parágrafo a dizer o porquê que estás a recomendar a escolha do método de price cap para Cabo Verde)

From the regulatory methods here discussed, it is therefore understood that the one which best fits Cabo Verde reality, is the price cap regulation. The choice of this method in a reality such as Cabo Verde, when compared to others, is due to the fact that it shows advantages by reducing costs of service and by eliminating inefficiencies of the type X, originated by excessive powers of the companies in service.

Economic and Social Regulation

Any regulation method used has to take into consideration the economic, social, political and cultural realities of the Islands and their populations. It is recommended that the chosen model, based on the RPC, shall take form via a public concession contract by which a price plafond, previously agreed with the concessionary company is applied and, subject to a time limit that can oscillate from three to six years.

Mandatory Public Service

The implementation of routes with an OSP with the objective of guaranteeing continuity, frequency, cohesion and economic and social equity of the inhabitants from all the islands which cannot, by themselves, generate enough flow of goods and people to economically and under normal market terms attract private investments, has to be also granted. The establishment and definition of such routes, when justified, has to be done by the regulating entity, in this case the AMP.

Under public interest, and in the name of transparency, the maritime service of passengers and goods in the unprofitable routes should be object of public tendering, under strict respect for the contracting rules and regulations in Cabo Verde. The contract shall give to the winning company exclusivity to operate the routes, thus being forbidden to others to enter and operate the same routes, either fully or partially.

It is proposed that the maximum time limit for the contract shall not be more than six years (including the prorogations) and having as a minimum the limit of three years. Up to six months before the expiry time of the contract, the operating company shall manifest to the authorities its willingness or not to renew the contract.

The exploitation of an unprofitable route presumes that the Government concedes to the concessionary a compensatory indemnity fee which should be calculated on the basis of the annual commercial deficit. That calculation shall take into consideration operations costs and the necessity to guaranty to the concessionary a minimum profit which is to be fixed by the regulatory companies and negotiated with the concessionary. The calculations of the compensations shall take into consideration the reports of the concessionary, separated by activities.

Quality Control and Application of Sanctions

Service quality control implementation should be considered one of the most important principles of regulation. A good set up of a regulating system clearly calls for the implementation of a quality service program that objectively establishes the terms of service and the minimum indicators to be obtained for the service to have quality and to be just for both parts.

Therefore, establishing good performance indicators to measure quality and sanctions for illegal or bad performance should be an important part of this program. In other words, a system of accountability has to be established.

a) Performance Indicators

An important part of the concession contract for maritime transport service has to do with the nature of its quality control. Thus, it shall clearly state the road to be followed for quality control, the minimum index measurements of quality performance and sanctions applied. Good performance should be encouraged, and a system of public recognition and bonus is recommended. The minimum quality indexes for performance can be measured through the use of key performance indicators (KPI).

b) Measuring Quality

The main objective to measure quality is warrant the consumer citizen that the service is given under the terms it has been contracted for.

Therefore, a system of complaint to the authorities, by the consumers, should be implemented. In order to gain confidence from the consumer, it is necessary that they

get quick answers from their complaints. Complaints that are logged on the complaints book shall be sent to the regulating entity no later than ten days after it has been recorded. It is under the powers of the AMP to decide on the complaints and to inform the complainer about the corresponding decision. AMP, as the regulating body, shall have no more than 30 days to deliberate on complaints. It may be allowed to extend the limit, when and if justified, for an equal time period of for a greater period if it has the agreement of the complainer. The decisions of the AMP shall be binding for the concessionaire and may be subject to a fine on the cases of miscarriage.

For a greater service quality control and for the purpose of building a database on the maritime transport service, all registered companies, with AMP, shall be obliged to send quarterly written reports on their services. For this effect, AMP shall provide to all companies a *template*, that shall make it easier for the companies to draft the report and stimulate the accomplishment of their obligations with the controller.

Performance indicators, based on key indicators established by AMP, shall be published every six months, with special reference for the OSPs. Examples of KPI that shall be enforced are compliance with the schdules, number of passengers transported, service satisfaction, number of complaints per thousand passengers, etc.

c) Faults and Sanctions

Poor service or failure to perform on the minimum standards of quality should be qualified under three types of offenses ranging from light, grave and very grave. The penalties associated with each have to be clearly stated in the regulations and made public in agreement with the law. The sanctions can range form of a fine, the cessation of activity, the cessation of the OSP contract, among others, depending on their weight in relation to the conditions of contract and other rules for the service.

The control on the quality of the service shall be performed on all companies registered with AMP, independently of the type or qualification of route they are working. Notwithstanding the fact that for commercially feasible routes, the market takes care of eliminating bad performers, it may be a good basis to establish their comparison and set their measurability to key performing indexes.

Establishing Prices and Tariffs

Prices and tariffs are probably the most important aspects of a regulating system. After all, those are what the users will really measure in the day-to-day uses while measuring the quality of the service provided and will define if the service will or will not serve its main purpose.

As the RPC is the method that has been chosen to be adopted for the case of Cabo Verde, prices and tariffs shall be established through the RPC, as it directs companies to better their efficiencies with the goal of reducing costs and increase profit margins. The application of this method brings about noticeable advantages as the consumers can directly benefit from the gains in efficiency it can generate from one to the next concession period. The greatest the value of efficiency gained (the X factor) the less the value of prices and tariffs.

The method is composed by two parcels, being one the IPC (consumer index) and the other the X factor. Determining the X factor in a reality, such as Cabo Verde, where information asymmetry is the daily reality, constitutes a challenge for the application of the RPC method.

For the case of Cabo Verde where, as above referred, prevails asymmetry in information, it is proposed to apply the method of PTF through the Törnqvist index in order to determine and dimension the X factor. The Malquist index, which is also widely used for this purpose, and which could have been used here, is not considered an appropriate choice here as it targets to benchmarking technics, for the determination factor of efficiency, which are not possible in the case studied here.

For the chosen Törnqvist index, here below it is shown how the X factor, inputs and outputs are used:

Figure 2: Technological production of the maritime transport (cargo and pax) of Cabo Verde

On the input side of the equation, the costs are assessed by their costs where, the staff represents the number of employees working on a full-time basis in a year, and is given by the ratio between their costs and their number. The Operational Expenditure (Opex) includes all operating expenses except spending on personnel. It's price is measured by the IPC for transport. The last input, Capital Expenditure (Capex) is the net asset and the corresponding price is given by the ratio of the financial burden and the net assets.

On the output side, the revenue is obtained by the number of passengers. Their estimated price is given by the ratio between the turnover and the number of passengers carried.

Results obtained

The table below shows a tendency for productivity to decrease over the years studied even though, between

2013 and 2014, it presents a small increase. The observed variables do not follow a standardized trend, which can be justified by several factors. As an example, there is an increase in staff number in 2014 due to the fact that CVFF brought into operation a new vessel, Liberdadi, by the second half of the year.

It is also verified from the table that the output index (revenues) shows a decrease between 2011 and 2013, contrary to the trend in 2014. The trend observed between 2011 and 2013 is justified by the decrease in turnover, as the number of passengers has come to increase over the years, coupled with the fact that the number of connections made between 2011 and 2014 has decreased.

Table 1: Results obtained from the analysis, accumulative values

Observations	Output	Input	TFP
2011	1,0000	1,0000	1,0000
2012	0,8852	1,0667	0,8298
2013	0,7493	1,0000	0,7493
2014	1,1256	1,5000	0,7504

Table 2: Statisticals results

	Avg.	St. Dev.	Median	Min.	Max.
Acc. values	0,8324	0,1179	0,7901	0,7493	1,0000

After calculating the TPF, a statistical analysis was performed. Trough the linear regression method, it was possible to conclude that productivity in this sector, as given by the current trends will always be decreasing, as shown in the equation below which yields a negative multiplier for input x.

$$y = -0{,}0829x + 167{,}73$$

Equation 2: Linear equation of the analysis conduct

Thus, in theory, one can say that the current sector situation, as here portrayed by the data from CVFF is quite worrisome. Since the same productivity has a downward trend, the profitability requires a review as soon as possible. Factors to be considered should take into account if the type of vessels, including the price for the trip, serve properly the needs of their populations.

It is important to notice that the data used take into account only a small sample of the country's reality. As mentioned elsewhere in this text, public information on this subject in number and quality is not the best and hard to find or sometimes inexistent. For a decision, with quality, it is recommended to look for or build more reliable data. Otherwise, this model, or for the fact, any other, will not serve its purpose correctly.

It is advised throughout the literature, that while using the RCP method, the maximum duration period for the prices and tariffs shall vary between three and six years. Therefore, this exercise should be done periodically, according to the circumstances and facts available at the end of each period. For this particular case, considering the low reliability of the information available, it is recommended that a revision be made at maximum after three first three years. Anticipating a revision should only be considered if an extraordinary circumstance such as the economic conditions, business risks, or other information change in a way that makes it wise and justifiable.

7. Conclusions

The market liberalization took place in the beginning of the 21st century, that exempted the Public Sector from its responsibilities in the maritime sector, brought about new challenges to the market. That created new opportunities and opened the door to privates, whom from then on had to assume as providers of the service. However, a deregulated market left populations, namely those from smaller islands, which could not generate enough cargo and passenger flux to justify private investment, without services.

This left both consumers and the operating companies claiming for a regulated market, which gave rise to a regulatory entity, the AMP, with an independent statue, with powers, and a mandate to respond to the new challenges, inherent to a developing private market.

The proposed regulation model, based on the RPC model, certainly has its own limitations, like any other will, however it shall suffice the current needs for a more harmonious development of Cabo Verde market and for its populations. It embodies and responds to three principal aspects needed in the market: mandatory public service, quality control and sanctions, and prices. These changes can be resumed as follows:

Mandatory Public Service: the establishment of the OSPs shall warrant the universality, continuity, justice and frequency of the internal maritime service, serving all the populations of the country, independently of where they live. Service providers shall be contracted through public tenders, giving exclusivity to the wining company for the routes tendered, having a minimum and a maximum limit of three and six years respectively. Companies should be granted compensations for the losses in the routes, based on operating losses, calculated through yearly accounting documents.

Quality Control and Application of Sanctions: the control on quality service to be established has to be objective, and has to guarantee to the consumer that services are being provided in terms it has been contracted for. The means for controlling the quality provides for implementing a system of *key performing indexes*, defining minimum indices to be respected by

contracted companies and sanctions that may be applied for bad performance. Complaints from users will be a major source of information, analyzed and decided on by the regulating agency.

Establishing Prices and Tariffs: tariffs and prices, as well as their control are important particularly for the concessionary routes which are not feasible in a market free situation. It was proposed that the RPC method, also known as the IPC-X method, be used for this purpose. The IPC and the X factor are two important variables to be determined, by use of the Törnqvist index method. A market like Cabo Verde can profit from such method, as it allows for the calculations, without resorting to *benchmarking*, which due to lack of meaningful data it is not currently possible.

Initially, it is recommended that prices and tariffs shall be periodically revised with a minimum three years period. Only extraordinarily, if deemed necessary due to changing economic circumstances, business risks, or other market situation that may justify anticipation, the period may be shortened.

Under the evidences of currently existing literatures, and by comparison with other similar realities, this comprises the model being recommended for Cabo Verde. We believe that it shall and will make the difference and constitute a much needed impulse in the sector, to promote development for the country and serve the needs of its population. This is the method that best suits the needs, it is recommended that the application done in terms here proposed.

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