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THE EFFECT OF PRODUCTION CAPACITY AND DESIGN OF OUTPUTS ON THE PERFORMANCE OF OPERATION

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Abstract:

The efficiency of operational performance in manufacturing and service industries largely depends on production capacity and the design of outputs. This study explores the relationship between these factors and their impact on overall operational effectiveness. A well-optimized production capacity ensures resource utilization and cost efficiency, while a strategically designed output enhances product quality, customer satisfaction, and market competitiveness. Through a combination of theoretical analysis and case studies, this research highlights how aligning production capacity with output design can improve workflow, reduce bottlenecks, and enhance productivity. The findings suggest that businesses that integrate flexible capacity planning with innovative product design can achieve sustainable operational performance. This study provides insights for managers and industry professionals to refine their production strategies and improve overall efficiency.

Keywords: Production capacity,Operational performance,Output design,Process optimization,Logistics performance

INTRODUCTION

This research relates to the evaluation of "logistics performance" and aims to provide a conceptual framework, a methodological framework and an empirical validation from a survey in companies.

The concept of logistics performance can be analyzed at different levels: from a micro-economic point of view, on the one hand, the concept comes from the discipline of management sciences; from a macro-economic point of view, the analysis focuses on the logistical performance of firm systems (national, regional, sectoral), on the microeconomic level, first of all, it designates the capacity of firms to efficiently organize the circulation of their products and their inputs. It is above all the discipline of business management which is interested in this question of "logistics performance" as a tool for the development of the firm. The ubiquitous discourse on the need for a Supply Chain Management (SCM) orientation is part of this problem, and its relevance can be questioned.

It was at AT Kearney that we were the first to recognize the influence of logistics excellence as a source of competitive advantage. In Europe, the number of firms that can be credited with logistics excellence has grown in the space of a few years: in 1992, AT Kearney estimated this group at 4% of the business population. In 1997, the ELA study estimated it at around 10%. Leading companies in the application of the most sophisticated logistics methods derive clear benefits from the average business. Their logistics costs would be 41% lower (4.2% of sales versus 7.2% for the whole). The results presented by ELA suggest that leading logistics companies appear to be more responsive and better positioned on the market for two main reasons:

- They more widely use advanced logistics management control techniques. As a result, leaders know the reality of their logistics costs and are able to target their efforts and their progress plans.

Much more than other companies, leaders accept the permanent questioning of their organization. Whether by periodically overhauling everything (reengineering principle) or by closely observing the practices and performances of competition or neighboring business sectors (benchmarking), these firms are part of the logic of flexibility and adaptation.

To assess the logistics excellence of these companies, several basic components must be surveyed:

- The solid establishment of links with customers based on an understanding of mutual needs.
- The implementation of a powerful supplier partnership
- The existence of long-term logistics planning
- Integration of different functions in the planning process
- The implementation of continuous quality improvement programs
- The involvement and mobilization of staff in these processes
- The use of information systems as an aid to intra and inter-organizational coordination
- Active use of cost and quality of service performance indicators

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From a macro- (or meso-) economic point of view, the evaluation of logistics performance focuses on firm systems, most often at national or European level, but also at the level of a territory such as the region. , a sector or a sector. It integrates the issue of infrastructure, public policies, collective organization of transport and logistics as well as external effects.
From a macro- (or meso-) economic point of view, the evaluation of logistics performance focuses on firm systems, most often at national or European level, but also at the level of a territory such as the region. , a sector or a sector. It integrates the issue of infrastructure, public policies, collective organization of transport and logistics as well as external effects.
At this level, performance is generally analyzed through the productivity of the activity. However, applied to the analysis of the transport and logistics sector, such an analysis poses important and now well-known problems, among which we will highlight two aspects:
- The measurement of the "physical" production of the transport of goods: national statistics generally use the tonne-kilometer. However, from an analytical point of view, it makes no sense to consider that transport produces tonne-km instead of a service.
- The inability to take into account the external effects of transport; in other words, analyzing productivity through the t-km indicator would be tantamount to considering that the more the sector produces (t-km), the more productivity and therefore well-being increases, which is contrary to all analyzes. in terms of sustainable development.
The analysis of the logistics performance that we will present in this report falls within the industrial and services economy and is therefore situated essentially at the meso-economic level (at the level of the sub-systems: territories, sectors, sectors, groups of firms). However, we will also use management and macroeconomic approaches, which we will deepen later.
The research is structured as follows. First, we will present an in-depth analysis of logistics performance through a reading grid of inter-company coordination and the concept of transport service configuration. In a second step, we will analyze the link between logistics performance and development in terms of development trajectories of firms and territories as well as the role and limits of public policies. The third part is devoted to an analysis of our business survey data.
The research leads to the proposal of a methodology for monitoring the logistical performance of a productive subsystem (sector or territory). In the fourth part, we will develop this methodological framework in the form of a dashboard intended to be used in further research .

Logistic Performance Assessment

I.1) the semantic problems of performance

Before thinking about the determinants of performance, it is important to identify the different concepts that performance covers: effectiveness, efficiency, productivity, etc.
For the neoclassical economist, only the concept of efficiency exists, productivity being the indicator. We will retain the following definitions: efficiency is the ability to achieve objectives while efficiency refers to the output / input ratio. The increase in efficiency comes from the maximization of the use of resources which leads to an increase in production without increasing costs, or the delivery of a given level of production or service by reducing factor endowments (Desreumaux, 1992).

Billaudot (1995) extends these definitions as follows:

"We talk about efficiency with regard to a performance defined or measured as the relationship between an output and all or part of the means, still qualified as inputs or resources, mobilized to obtain it. The output in question is what is obtained from the activity mobilizing these means. As this output is something other than these means, we are in the presence of a dimensioned quantity.
We talk about efficiency in relation to a performance defined theoretically or measured empirically as the ratio between a result and a standard relating to the same thing, ie the result that we should normally have achieved. This thing can be any element of an activity. As the observed result and the standard are expressed in the same unit, any efficiency indicator is a quantity without dimensions. "
A certain number of works aims to provide a global vision of performance which is not only limited by financial data. The research of Quinn and Rohrbaugh (1983) in particular justifies the imprecisions which surround performance by the fact that the latter is a construct mobilizing different notions. Typologies of these notions exist, we will cite three: that of Scott (1977), that of Seashore (1979) and that of Cameron 1978)).
Scott distinguishes rational variables, natural variables and systemic variables as entering into the performance of an organization. The rational variables integrate the number of units produced for a given period and for the number of units of production factors (productivity / efficiency). The natural variables do not only consider the production function but also the support activities, which justifies the interest in the cohesion and morale of the employees. Finally, systemic variables highlight the acquisition of resources and adaptability.

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Vol. 44, March, 2025
ISSN: 2749-3628,

Seashore (1979) adds interest to the decision-making process. An efficient organization is indeed one that has a process for collecting, storing, retrieving, allocating, manipulating and destroying information optimally.
Cameron believes that an efficient organization must satisfy the actors that compose it, as well as the objectives, and optimize the acquisition and use of resources as well as the internal process. As part of this approach, the organization is considered to be a set of dynamic coalitions with a complex network of transactions developed by its components. The efficient organization must sufficiently satisfy each of the elements so that the transactions can continue.
Morin et alii (1994) present a comprehensive literature review on organizational performance. The reflections are numerous and lead, for the most part, to an observation of the complexity of the concept and the antagonism of the different dimensions. Morin et alii (1994) identify four main currents of thought:
- Classic bureaucratic theories which favor economic criteria
- The school of human relations which posed in particular the problem of the integration of individual and organizational objectives - The systemic approach which defines the organization as a system whose purpose is survival
- The political approach of the organization which essentially refers to the satisfaction of the various external groups such as donors, supplies, customers, society and regulatory bodies
To each of these currents of thought correspond particular criteria of organizational efficiency which have the disadvantage of being theoretical and partial.

The four dimensions of organizational performance can be summarized in the following table:

Human resources value Staff engagement Staff morale Staff performance Staff development	Economic efficiency Resource saving Productivity
Legitimacy of the organization with external groups Donner satisfaction Customer satisfaction Satisfaction of regulatory bodies Community satisfaction	Sustainability of the organization Product quality Financial profitability Competitiveness
(source: Olivier de La Villarmois)	

It therefore appears that performance measurement is multidimensional and correlative from the point of view chosen. If ideally, the measure should be global, it is most often limited to the calculation of a productivity indicator. Originally, the concept of productivity was basically a physical concept that compared the units produced to a factor of production. The overall productivity index also develops a system of
weighting by prices or by factor shares in total cost. The essential weakness of the overall productivity indicator is therefore linked to the choice of the weighting system and its justification. As for partial indicators, multiplying the number of production factors by the number of products suggests the number of partial ratios that can be calculated.
The use of microeconomic theory is necessary to have a multidimensional approach to performance. The production function (also called production frontier) describes the relationship via a technical process between on one side the factors of production, and on the other the production resulting from this process (Battese et alii, 1998). A production function therefore formalizes the relationship uniting N factors of production with M goods produced, for a given period t.
The production economy uses the concept of distance function (Shephard, 1970) in order to obtain a measure of the efficiency of a decision-making unit in relation to a border grouping together all the efficient units. All the observed entities produce the same outputs using the same inputs. A unit belonging to the border is efficient, while a unit outside the border is not. When he only has physical quantities, the economist reasons in terms of technical efficiency. If he has the price of inputs or that of outputs, he can measure cost efficiency and income efficiency respectively. An indirect measure of efficiency is used when the manager is assigned an income target or a budget constraint.
With regard to the empirical measure of efficiency, a distinction is made between parametric methods, specifying ex ante the form of the production frontier, such as the Socha method (Stochastic Frontier Analysis) and non-parametric methods, such as the method indices or the DEA method.
The Cobb-Douglas function is the most common form of the function. It takes the form of a mono-production with two factors of production (capital and labor generally). But the hypotheses limit its use, in particular that of elasticity of substitution between factors equal to 1. There is another category of functions, called CES, where the returns to scale can remain constant, but the elasticity of substitution can differ from 1. The translog function is a function capable of solving the problems of substitutability between the factors. In other words, it is not necessary that there is perfect substitutability of the factors in the translog format.

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This assessment of the production function makes it possible to account for a possible source of productivity: technical change, which corresponds to a displacement of the production function over time. However, the results remain somewhat mixed, due to the difficulty of obtaining a correct estimate of the functions that we observe and the strong hypotheses that frame the models.

Nonparametric methods

Another avenue could be index methods, which some authors consider to be much more reliable.
Four functional forms stand out when we talk about the notion of index. These are successively:
- The Laspeyres index of quantities. The index defines the ratio of the quantities in period t multiplied by the prices of the previous period, over the quantities of the previous period multiplied by the prices of this same period. The prices in period t-1 are used to weight the quantities of the 2 periods.
- Paasche's index of quantities. The index defines the ratio of the quantities in period t multiplied by the prices of the same period, over the quantities of the previous period multiplied by the prices of year t. The prices in period t are used to weight the quantities of the 2 periods.
- The Fischer index is the geometric mean of the Paasche and Laspeyres indices. This index is considered ideal.
- Törnqvist's clue.

Time breaks in the statistical series constitute major obstacles to the use of index methods on the one hand, and to the relevance of their results on the other hand. The choice of the pivotal year is also an essential dilemma to be resolved. However, this method has many advantages including that of allowing the introduction of new outputs during the study, and being more respectful of the effect of time.
The DEA method for its part "is a linear programming technique, responsible for measuring the relative performance of organized units where the presence of multiple inputs and outputs makes comparisons difficult" (Dyson, Thanassoulis, Boussofiane, 1990). This method measures the performance of a unit relative to the performance of similar units by using inputs and outputs to score each unit. It takes into account the existence of multiple inputs and outputs without the need to specify beforehand the form of the production function. Linear programming makes it possible to know the position of each unit in relation to the situation of an ideal unit, belonging to the frontier of empirical production, proposing a given quantity of outputs with the minimum of inputs or the maximum of outputs to given inputs.
This method allows an evaluation of productive efficiency and also makes it possible to analyze the impacts of different determinants. Also, beyond the measurement of productivity itself, there is the question of its mode of training. The approach therefore incorporates the question of sources and determinants of productivity, the determinants being understood as the set of factors likely to influence the evolution of efficiency. The notion of determinant is distinguished from the sources of productivity, which refer to a structural decomposition of the latter.

I.2) Logistics performance and management sciences

It is in management that the place of performance appears crucial. A great deal of research has focused on the influence of a particular parameter on the performance of a organization, which is most often evaluated in terms of financial or commercial results.
Few results on logistics performance are highlighted and when they are, they are most of the time of a financial nature (Cadiou, 1995; Jaffeux, 1997) or only take into account the time and / or space dimensions. (Fabbe-Costes, 1991; Fiore, 1995).
However, faced with an increasingly complex and turbulent environment, relatively convergent publications tend to indicate that the efficiency of a global supply chain is measured by its level of reactivity, rapid reconfiguration of processes, d elimination of waste and intelligence. For Mesnard and Dupont, the pillars of efficient logistics are fourfold:
- reactivity, ie the speed at which the system responds to disturbances
- agility, ie the speed at which the system adopts its cost structure
- efficiency, ie the elimination of all forms of waste
- intelligence, i.e. the maximum exploitation of all information.

The Supply Chain Management (SCM) approach becomes the archetype of logistics performance, emphasizing the necessary dynamic management of interfaces, and its role in creating value (whereas logistics tended to favor a logic of 'cost savings). From the perspective of resource-based management, the effective mobilization of a set of skills in the strategic universe of the firm becomes essential, and must be accompanied by interface management on both a physical and information level.
But as Paché (2000) points out, "all of this risks remaining somewhat vague, even nebulous, for business decision-makers, especially if they do not have a clear and rigorous steering instrument guiding action". Several approaches have thus been put forward to assess logistics performance.
We can cite by way of illustration the World Class Logistics model (Estampe et al., 2000), the ASLOG model (French association for logistics) (Pimor, 1998), the SCOR model (Supply Chain Operations Reference model) (PRTM, 2002), the Prospective Dashboard (Morana and Paché, 2000) as well as the Strategic Profit Model Stapleton et al, 2002))

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We will analyze these models in more detail in Chapter 4, which deals with the methodology of a logistics performance dashboard. We will see that the problem with these approaches lies in their static and individual character. In addition, other problems arise, linked to the specific nature of service activities, as we will see now.

I.3) Performance in economy: The particular case of service activities

The "production" of service activities?

Probably the most problematic is the measurement of production, particularly that of the service sector. The concept of productivity, in its multiple dimensions and variants, comes from the so-called material production or production of autonomous objects, quantitatively identifiable, countable when they are reproducible, or analyzable in terms of volume indices when they form a heterogeneous set. The difficulties lie in the fact that we cannot agree on a definition of the product for the type of activities that interest us, for two types of reasons. On the one hand, the services, processes and results are poorly standardized: we cannot classify these products according to standard ranges of cases, due to the relational dimension of these services. We are also hesitant about value systems, that is to say the possible dimensions of products more or less present depending on the services; these are the technical or industrial, market or financial, relational or civic dimensions.

The three schools which deal with the analysis of services, the Lille school (Gadrey), the Lyonnaise school (around Barcet and Bonamy) and the management sciences (Eiglier, Langeard) share in spite of their differences a point of common view consisting in placing the service relationship at the heart of the analysis. Indeed, a service activity can be defined as an operation, aimed at transforming the state of a reality C, owned or used by a consumer B (or customer or user), carried out by a service provider A at the request of B , and often in relation with it, but not leading to the production of a good likely to circulate economically independently of the support C. This definition makes a distinction between service as a production process, which is based on the connection of the 3 poles A, B and C, and service as result, that is to say the transformation of support C.

The extreme diversity of logistics and transport services

As with all service activities, and perhaps in a more extreme manner, the diversity of transport / logistics situations further complicates the apprehension of the production of the logistics and transport service.

We traditionally distinguish between traction activities and logistics services, geared towards rewarding activities excluding traction. The stylized diagram of a complete physical distribution service indeed includes approach traction, related activities, and terminal traction, each of these sequences being of variable importance. The related services performed on the warehouse and / or platform relate to technical physical distribution operations (linked to the break in load and then to the terminal delivery) and management operations integrating a series of IT services.

We thus distinguish:

- operations related to the change of load: reception and control of goods, handling and storage, shelving, etc .
- operations linked to terminal delivery: preparation of orders, creation of promotional lots, bagging, price marking, etc.
- the actual management operations: taking orders, monitoring expiration dates, inventory management ... For this last point, the simplest is when the logistics provider only manages material accounting from inputs and out of stock decided by the prescriber. The most sophisticated is when the same service provider has decision-making autonomy in the formulation and implementation of inventory replenishment procedures.
- IT services: inventory management, fleet and order preparation, customer accounting, remote transmission. Physical services are indeed accompanied by IT services to enable the initiation, neither too early nor too late, of the various activities (transaction IT), while improving their monitoring (management IT). In addition, the increasingly strong integration of IT systems allows providers to position themselves on peripheral prescription activities: development of demand forecasting for suppliers, advice and logistics engineering.

The most commonly offered services are inventory management, preparation of deliveries, transport and transit. Paché, Sauvage, 2004))

Technical progress and productivity

Taking technical progress into account is also a problem in measuring productivity. While over the past 25 years, information and communication technologies (ICT) have spread massively throughout the economy and these are considered to be radical innovations, a source of new As a "technological paradigm", productivity, as measured in statistical studies, stagnated over the period, and more particularly in the service sector, which consumes a lot of computers. This "productivity paradox" is found in Solow's formula that "the age of the computer has arrived everywhere, except in productivity statistics." Logic would have meant that investments in innovative technologies would translate into productivity gains.

Solow's formula finds its counterpart in the work of managers. As Lorino (1989) points out, the massive renewal of techniques, which concerns both industry and services, has not led to the expected levels of performance in companies. "The very way that managers define productivity gains and the tools they use to achieve them take them further away

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Vol. 44, March, 2025
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from their goal." Economists and managers are therefore faced with a series of questions about the relevance of their analysis and measurement tools.

Productivity, a Fordist notion?

In fact, it appears that the notion of productivity is attached to a particular production regime which is the Fordist regime, and is therefore no longer relevant to characterize the contemporary regime. At the microeconomic level, the relevance of the concept of productivity was due to the fact that it could constitute a management tool at the level of the firm. When the volume of production is clearly correlated to a volume of work implemented and when the products obtained are the subject of sustained demand on the markets, then the productivity indicator becomes an objective criterion of organization and remuneration.

work. In a context of internationalization, tertiarization and diffusion of ICT, the notion of productivity must be reconstructed, on the one hand, at the microeconomic level, companies have outsourced many phases of their production process or have increased cooperation, which gives their activities a character of service provision which is no longer immediately identified with the manufacture of a product. The quality of the services becomes as important as the quantities offered. In addition, the requirements for short / medium term financial profitability are now manifested by reorganizations of activity in the profit center, by outsourcing, and even merger / acquisition movements. The number of companies capable of identifying their activities with the production of quantities of products has considerably decreased, on the other hand, at the macroeconomic level, the internationalization of productive processes limits the possibility of assessing the volume of national production at the aggregate level.

However, without completely rejecting the concept, we must be aware that it may retain a relative relevance for certain tertiary activities or certain levels of organization of services, but that it constitutes only a partial criterion of efficiency, services calling, even more than the industrial production of goods, for the economic and sociological analysis of their indirect or mediates effects or of final type on the users, because of the specificity of the social report which is deployed there and of the time horizon of their impacts. Recent approaches to the evaluation of actions (public actions, but also services) distinguish the concepts of economy (cost reduction), efficiency (close to productivity) and effectiveness (concept attached to indirect impacts or effects actions). Gadrey thus distinguishes between immediate products and mediate products (or indirect results).

However, "between the product, even if it was above all in services, a social construction with multiple dimensions, and the working time of production, relations still exist that developed capitalist society is not yet about to abolish, and productivity remains one of the most immediate modes of understanding these relationships "(Gadrey, 1996). Classical productivity analyzes remain possible and practicable as soon as reproducible and quantifiable acts or results can be defined with sufficient precision, "products" or "pseudo-products" obeying certain standards of qualitative stability over time or 'space. Service productivity takes on meaning when the services consumed can be qualitatively defined according to technical or social rules, in a sufficiently codified way to allow comparisons. These are therefore activities which lead to the recognition and measurement of an immediate product or direct product for the user. But the fastest growing services since the 1950s are precisely relationship and professional services that do not lend themselves to quantitative analysis of an immediate product and efficiency studies based on productivity alone.

I.4) Relative performance assessment

One of the essential questions posed by the analysis of the service relationship itself, that is to say the modes of relationships existing between provider and client in the context of the production of the service, is that of the very construction of the object: can we, and to what extent, treat the service relation as an object in itself, that is to say analyze the relation AB without rewriting it in the whole process of production of the service?

Gadrey (1994) proposes a classification of the different service activities according to the type of participation, operational or control, of the client in the production process of the service, and within each of the two types, according to the degree or intensity of this participation

The different types of interaction in the service relationship				
Process control by the customer			Customer operational participation	
Low			**Important**	
Control	substantial	and episodic	Passive client or receiver, limited to choosing a contract or a formula	Formula logic offered and used either in coproduction or self-service, the most often on site

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Vol. 44, March, 2025
ISSN: 2749-3628,

Control	frequent and	procedural	Customized outsourcing logic. The client has the skills to control but does not want to do it himself	Strong cooperation, co-organization, complementarity of tasks and knowledge. Operational interface and decision-making.

Likewise, logistics performance cannot be assessed on an absolute basis but on a relative basis, by re-entering logistics and transport activities within the productive process. This observation is summarized in the remark by Colin (2004) who writes: "there can be no intrinsic performance in logistics. Only the performance of the activities (or functions) supported by logistics and the performance of the distribution-production process are of interest. "

By proposing an analytical framework based on contingency variables, Chow et alii (1995) similarly underlines for management sciences that performance cannot, and should not, be evaluated on an absolute basis but rather on a basis relative which depends on variable factors such as the strategy of the company and its structure. The approach can be broken down into three stages:

The first consists in classifying the strategic objectives in order to establish the priorities which will constitute the means by which the company intends to maintain or improve its competitive position. Strategic objectives can be, for example, cost control, growth, customer satisfaction, operational productivity.

The second step is, for each of the strategic objectives, to classify the logistical objectives in order to establish their priority as a factor contributing to the achievement of the strategic objectives.

Finally, for the third step, a scorecard is used, allowing the logistical results to be represented on the basis of key indicators associated with each of the logistical objectives.

I.5) Transportation as a production coordination tool

From the point of view of meso-economic analysis in industrial economics, the coordination of the actions of economic agents is at the center of the economic problem. Coordination is understood as that of activities carried out by individuals (provided with procedural forms of rationality), who pool production factors in the broad sense for this purpose (information, knowledge, natural and financial resources, intermediate goods, work). In heterodox approaches, we consider an enlarged set of resources engaged in the production function and a multitude of forms of coordination, fundamentally opposing price coordination, the only mode of coordination taken into account in neoclassical theory, and coordination outside the market, by the rules, the organization, the institutions.

If we consider the transport of goods, and more generally the logistics in which it is inserted, from this point of view, we can consider that logistics activities have a role of coordinating production with its environment of resources and request. These activities include both upstream (supply) and downstream (distribution, customer relations) coordination, organizing the flow of goods and related information flows as well as storage. It is therefore a question of coordination over time (storage, just-in-time, management of seasonality) and in space (transport flow, distribution).

In such an analytical framework, transport constitutes one of the instruments of spatial coordination between firms. It covers the transfer of products in space, but also the articulation of incoming or finished product flows at the rhythms of production and demand.

Correlatively, the multitude of forms of coordination of production corresponds to a plurality of organizational forms of transport and logistics. Indeed, depending on the constraints of the product, demand, supplies, type of customers, traffic is organized differently. Each logic production logic - circulation logic corresponds to a specific performance logic. The diversity of configurations observed through this analysis of transport and logistics as a tool for coordinating firms thus joins the observation of the preceding analysis of transport as a service. The difficulty that arises from this diversity in assessing the performance of this activity is central to our problem and constitutes the starting point of the framework for analyzing transport service configurations that we are now developing.

I.6) Dynamic evaluation of performance: servicial trajectories in transport and logistics

We are referring here to the regulatory analysis framework of productive models, and more particularly to the notion of productive configuration as it was developed and applied to services by C. Du Tertre.

The diversity of productive models present in an economy implies methodologies adapted to the understanding of their productive efficiency. If the "standard" productivity assessment techniques that we have presented above can be valid for certain activities, they become inadequate for others, and in particular the service activities for which Du Tertre (2000) reasons in terms of logic of efficiency. The productive configuration is defined as the consistency of the company's functional devices with the production services, as summarized in the diagram below:

Du Tertre thus identifies seven configurations:

World Economics & Finance Bulletin (WEFB)
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Vol. 44, March, 2025
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- Agriculture and the exploitation of living things;
- Series industries;
- Process industries;
- Construction industries;
- Logistics services (including transport)
- Administrative and information services;
- Intangible and relational services.

If we limit ourselves to this analysis, we see that the transport of goods is mainly classified in the productive configuration called "logistics services". The treatments relate to a tangible medium (freight in this case) which is mainly to move, transport, etc. This major configuration of the freight transport activity would enable the systematic use of formal productivity measurement procedures, if it were not itself invaded by the other two configurations.
productive characteristics of services: the so-called "informational" one and the other characterized "intangible".
Similarly, services are traditionally distinguished according to their main medium: material objects, information, knowledge or individuals. According to this classification, the transport of goods and logistics fall into the first category, since they aim to move objects in space.

Main support	**Service activités**
Hardware Object or system	Transport and storage Mail Wholesale and retail trade Repair, Maintenance Services Guarding Cleaning Hotel and catering
Coded information	Banking, insurance, finance Administrative services Postal services Telecommunications Electronic information services
Information processed = Knowledge	Management consulting (including company training) Research and development
Individual	Education Hospital services (medicine and health) Services for individuals (hairdressing, aesthetics, care services, home help, etc.)

However, this analysis does not take into account the complexity of the majority of services, and does not allow an analysis of the influence of the introduction of communication and information technologies. Indeed, studies carried out on innovation in road freight transport (TRM) (Djellal, 1998) and on the effects of the introduction of ICT (Burmeister, Djellal, 2002) confirm the coexistence within this sector. " a fundamentally material and activity configuration integrating informational, relational and even intellectual and knowledge aspects.
This complexity can be taken into account by breaking down the product of the service activity into four operations1:
- the logistics and material transformation operations (M) which consist in "treating" tangible objects, that is to say transporting, transforming, maintaining, repairing;…
- the logistics and information processing operations (I) which consist in "processing" "codified" information, that is to say producing, entering, transporting it, etc.; These are mainly processing operations, coding of information, carried out using information technology for internal and external uses with objectives of working time management, quality management,

World Economics & Finance Bulletin (WEFB)
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Vol. 44, March, 2025
ISSN: 2749-3628,

performance evaluation, etc. The main tools developed are databases, quality control tools, etc.
- contact or relational service operations (R), those whose main support is the customer himself, and which consist of a direct service (in contact).
- the intellectual processing of knowledge. F. Gallouj (1999) adds this type of operation, also called methodological functions, to Gadrey's functional breakdown. He shows that they are particularly important for accounting for the dynamics and innovation in knowledge-intensive service activities. (like the board). But they are also present in other types of services, and in particular today in "non-informational" services.
One can thus, from a dynamic point of view, highlight several service trajectories in the transport of goods and logistics. Originally, companies in the sector developed purely material operations, then, driven by customer needs and supplier strategies, innovated to integrate more informational, relational and then knowledge processing.
Small, artisanal-style businesses are essentially positioned on the first stage and sometimes evolve on stage 2. The larger units and the transport and logistics groups "abandon" the transport proper in order to focus more on operations organization and management of the service.

The stages of enriching the transport / logistics function and the diversity of trajectories	
The stages of enriching the transport function	**Innovation trajectory**
Step 1 = (M)	Technological trajectory of material logistics alone
Step 2 = (M) + (I)	Appearance of an information and communication "technological" trajectory
Step 3 = (I) + (R) or (R)	Appearance of a direct or relational service trajectory
Step 4 = (I) + (C) or (C)	Appearance of a traffic coordination trajectory

For the past thirty years, the **"**material" configuration of transport and logistics activities has been "contained" by service activities responding to other productive configurations with strong informational, relational and cognitive components. Presumably, this change will have had the effect of blurring the rules for evaluating efficiency since the benefits of the TRM are becoming increasingly "intangible". Standard productivity measurement methods are no longer adequate, at least for these new operations.

I.7) How to define the transport service configurations?

To define the transport service configurations (CST), we start from the definition of the journey configurations. Indeed, if the transfer of a product in space always involves the three main principles of speed, security and capacity, the logic for achieving these results is different depending on the route configuration. Lefebvre (2002) distinguishes several path configurations:
- The different types of single shipment: consisting of a single batch traveling from one point to another and characterized by a high average speed and a short downtime. This configuration is the symbol of rail and road transport as it has
originally considered. Today it is the major characteristic of express transport, where reduction of transfer time, punctuality, responsiveness are the main performance criteria. Exceptional transport also corresponds to this route configuration, but performance is assessed here through the ability to organize the route, the safety of the goods and their handling.
- The different forms of grouping-unbundling, unlike simple sending, involves a process of rationalization. We can distinguish grouping after successive shipments (or unbundling) and the pickup (or delivery) circuit, a configuration for which the activity regulation operations - management of waiting times and pickup (or delivery) times) - are essential.
If this distinction (quite classic, moreover) between different configurations (spatial, but also in terms of time and management constraints) already makes it possible to establish a variety of logics of efficiency, it remains largely insufficient to explain the complexity of Logics implemented to achieve performance from the point of view of firms and production-circulation systems. This is why we combine it with the previous analysis of service trajectories to arrive at transport service configurations.
This notion can then be defined as the route configuration, enriched by the strategies of the different actors involved in transport and logistics, and more broadly by the interactions between the different actors of the production-circulation system considered, the services and treatments that the user undergoes. freight, as well as forms of organization of

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Vol. 44, March, 2025
ISSN: 2749-3628,

the circulation of the good and information related to this good. We thus arrive at a concept close to that of productive configuration resulting from regulatory analyzes, but adapted to the specificity of services in general (and in particular the co-production of the service) and of transport and logistics, in particular (and in particular the spatial characteristics). The following diagram summarizes this concept of transport service configuration and its link with efficiency logics.

To specify typical service configurations, we will use an analysis in terms of production and circulation logics (which allowed us, in particular, to distinguish

"Logistic families", see Burmeister, 2000). This analysis distinguishes, from the characteristics of production, four different logics - industrial, flexible, professional and immaterial - and associates with it logics of the circulation of goods, information and people. The combination with the different service trajectories - material, informational, relational and methodological - then leads to an articulation of all the logics of production, circulation and transport service which can be summarized in the form of a table.

This analysis clearly shows that once you leave the industrial logic, which describes itself relatively well using traditional analysis tools, i.e. the minimization of transport costs and productivity, Logistics and transport operations are becoming more complex, as is their coordination with production operations. We thus arrive at various efficiency logics that go beyond the strict framework of optimizing transport and storage, which only applies to the logic of industrial production. In fact, in the flexible logic, the efficiency logic integrates not only the optimization of transport, but also that of the management of information flows. In addition, the reliability and flexibility criteria of the logistics organization become at least as important as the cost criteria. To measure efficiency, it is therefore necessary to take into account not only the cost of transport, but also the times and the rate of service.

Flexibility refers in particular to the possibility of changing the logistics organization without significant time and cost. The almost exclusive use of road transport, outsourcing

Systematic transport operations and frequent in material logistics operations demonstrate the growing importance of this efficiency criterion.

In professional production logic, transport and logistics in the material sense

Usually play a role rather weak in efficiency of the production system. The efficiency log of such system is primarily founded on improvemen of the coordination between producers and users, in other words quality of interactions between the actors of the productive system. Improved transportation or communication tools can sometimes help improve coordination, but do not are not enough to measure efficiency of the whole system. The carrier can have an interface role in the relationship with the customer, but the evaluation of this role completely escapes the calculation of optimization of transport operations.

In the intangible logics of production, the logic of efficiency relates above all to the framework in which the coordination of the productive system takes place. Continuous improvement of the cognitive framework (knowledge shared by all actors in the system, articulation some issues knowledge held through each of actors) and frame institutional culture shared, adherence to common values, stable anticipation of each actor on the actions of others) makes possible an increasingly complex coordination between a large number of different actors, each holding specific skills.

In some cases, transport and logistics can help set up new forms of productive organization, as was the case in the development of modular production systems in the automobile. However, these cases are very rare, and transport generally has only a marginal role in systems primarily based on innovation and knowledge.

We succeed so to a variety of logic efficiency who articulated with the logics
productive. These efficiency logics are summarized in the table below:

Table: The complexity of logics of efficiency in the field of logistics and transport.

Production logic	**Transport service path**	**Efficiency logic**	**Efficiency logic**	**Efficiency logic**	**Interest of the productivity indicator**
Industrial	M or M + I	Travel optimization	Travel optimization	Travel optimization	Yes
Flexible	M + I	(cost / time)	(cost / time)	(cost / time)	Yes (for each optimization separately) No for all

World Economics & Finance Bulletin (WEFB)
Available Online at: https://www.scholarexpress.net
Vol. 44, March, 2025
ISSN: 2749-3628,

Optimization of movement and information management		Optimization of movement and information management		Optimization of movement and information management	
Professional	M + R	Optimization of the flexibility of the logistics organization	Optimization of the flexibility of the logistics organization	Optimization of the flexibility of the logistics organization	No
Immaterial	M + I + C	Improvement of the coordination process, of the quality of interactions between the actors of the productive system	Improvement of the coordination process, of the quality of interactions between the actors of the productive system	Improvement of the coordination process, of the quality of interactions between the actors of the productive system	No

The analysis of performance, classically assimilated to efficiency and characterized in terms of productivity, comes up against increased difficulties in the case of service activities. If the productivity indicator seems well adapted to describe the performance of logic particular, especially Fordists, it is much less so for activities where the very measurement of production is problematic. This is the case for service activities, where production only makes sense in the context of a specific relationship. In this case, the performance analysis must not only consider the service, the service, but also the production process of the service. It can therefore only be relative, in terms of the performance of the interactions between the actors.

The production process of the logistics and transport service In the case of logistics and transport, we consider these specific service activities as tools that allow production to be linked to its environment (notably resources and demand). Our reading considers logistics and transport activities as tools for external coordination. The firm has a variety of organization of these interactions with its environment (supply strategies, subcontracting, various distribution), and will therefore set up the logistics and transport organizations best suited to the nature of interactions considered. A consistent reading of the performance therefore does not agree well with the diversity of logistics and transport organizations considered. We therefore prefer to speak of multiple logics of efficiency. Logistics and transport services Correlatively, the nature of the logistics and transport services itself becomes more complex. A functional breakdown of the product of the service activity into different operations shows the coexistence of operations that are not only material (M) but also more intangible (I) (information processing), relational (R), or methodological (C) (knowledge processing). Transport service trajectories can therefore be identified, articulating different operations in a differentiated manner. The analysis of performance must be dynamic, and associated with changes in service trajectories. This study allows, first of all, to highlight typical cases, articulating logics of productive and logistical organization, configurations of transport services and logics of efficiency.

CONCLUSIONS AND RECOMMENDATIONS

CONCLUSIONS:

- Capacity utilization measures the percentage of an organization's potential output that is actually being generated. The capacity utilization rate of a company or a national economy can be measured to provide insight into how well it is achieving its potential. Essentially, it looks at how efficiently a country or economy uses its resources to generate output. It is calculated by dividing the output index by the capacity index.
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- Calculating the capacity utilization rate determines the degree to which an organization is achieving its full production potential.
- Corporate executives can use the rate to determine how much production can be increased without the cost of investing in new equipment.

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- Capacity utilization is more important for industries that produce physical goods rather than services.
- During periods of economic expansion, demand for goods and services typically increases. This leads to higher capacity utilization rates. Firms increase production to meet this increased demand, and as a result, their factories and equipment operate
- During periods of economic recession, demand generally declines, causing capacity utilization rates to fall. Firms may cut production, leading to underutilization of their facilities and equipment. Lower capacity utilization during these periods reflects reduced economic activity and potential inefficiencies as firms scale back operations in response to weak demand.

RECOMMENDATIONS:

1. Use professional Corporate executives can use the rate to determine how much production can be increased without the cost of investing in new equipment.
2. Companies should avoid both overutilization (which leads to inefficiencies and breakdowns) and underutilization (which wastes resources).
3. Apply Just-In-Time (JIT) and Total Quality Management (TQM) to reduce waste and improve efficiency.
4. Use automation and digital tools to streamline processes.
5. Train employees in lean principles and adaptive problem-solving to handle capacity constraints effectively.
6. Optimize energy and material usage to improve both efficiency and environmental sustainability.
7. Design outputs that minimize waste and allow for recycling or reusability.

REFERENCES

1. Barcet A., Bonamy J. (1994): "quality and qualification of services", in J. de Bandt and J. Gadrey: Service relationships, service markets, CNRS publications
2. Battese G. et alii (1998): "an introduction to efficiency and productivity analysis", Kluwer Academic Publisher, 275 p.
3. Bellet M., Kirat Th., Largeron-Léteno C. (eds) (1998), "Proximities: multiform approaches", Hermès editions, Paris.
4. Billaudot B. (1995): "from global factor productivity to global distribution productivity", IREPD working note, n ° 39, August, 38p.
5. Burmeister A. (2000), Logistic families: proposals for a typology of transported products to analyze changes in the organization of transport and logistics, report for PREDIT, October
6. Burmeister A., Djellal (2002)., The impact of information and communication technologies
7. Communication on the spatial organization of service activities, Cahiers de l'Economie de l'Innovation, n ° 19, January
8. Cadiou Y. (1995): "what are the real place and the limits of a logistics dashboard in the strategic decisions of companies", proceedings of the second international meetings of research in logistics, Marseille, January, pp 423-438
9. Cameron K.S. (1978): "measuring organization effectiveness in institutions of higher education", Administration Science Quaterly, Vol 23, pp 604-632
10. Chow G. et alii (1995): "logistics performance: definition and measurement", International journal of physical distribution and logistics management, 24, pp 17-28
11. Colletis G, Pecqueur B. (1993): "integration of spaces and quasi-integration of firms: towards new productive encounters", Regional and urban economy review, n ° 93-3, pp 489-508
12. Colletis-Wahl K., Meunier C. (2003): "Transport infrastructure and economic development in rural areas: which methods for which effects?", Research report for PREDIT, June, 73p.
13. Colletis-Wahl K., Perrat J., 2004, "Proximities and spatial dynamics", in Pecqueur B., Zimmermann J-B. (eds.), Local economy, Hermes, Paris, 115-132.
14. Colin J. (2004): "logistics from the point of view of management sciences", in logistics between management and optimization, coordinated by P. Lièvre and N. Tchernev, Hermes Science, Paris, pp 34-43
15. De la Villarmois O. (2001): "The concept of performance and its measurement: a state of the art", Les Cahiers de la Recherche du Clarée, April, 21p.

World Economics & Finance Bulletin (WEFB)
Available Online at: https://www.scholarexpress.net
Vol. 44, March, 2025
ISSN: 2749-3628,

16. Djellal F (1998), The rise of information technologies in "non-information services", Economy and Societies, n ° 32, EGS series, June.
17. Du Tertre C. (1995): "the sectoral dimension of regulation", in Theory of regulation the state of knowledge, under the direction of Boyer and Saillard, ed La Découverte, pp 313-322
18. Dyson R. G., Thanassoulis E. and Boussofiane A., (1990), Data envelopment analysis, in "Operational Research Tutorial Papers", L.C. Hendry and R. Eglese (editors), pp. 13-28, published by The Operational Research Society, UK.
19. Estampe D. et alii (2000): "world class supply chain management: where are the French companies?", Logistics and management vol 6, pp 87-94
20. Fabbe-Costes N. (1991): "Communication by EDI: for a real control of flows", Communications and strategies, n ° 3, IDATE, Montpellier and French documentation,
21. Fiore C. (1995): "The new logics of purchasing in mass distribution and the measurement of their performances", Proceedings of the second international meetings of research in logistics, Marseille, January, pp 453-465
22. Gadrey J. (1996): "Services: productivity in question", economic sociology collections, Desclée de Brouwer editions, November, 358p.
23. Gadrey J. (2001): "growth regime, productivity regime: can we think of post-Fordist regulations with Fordist concepts? ", The letter of regulation, December Gadrey J .:" Service relationships and insurance relationships in the economic geography of services ", in J. Bonamy and N. May, Services and urban mutations, Economica-Anthropos, 1994.
24. Jaffeux C. (1997): "the financial dimensions of logistics choices", in Logistics management: a transversal approach, Editions Litec, Paris, pp 111-144
25. Lahittete M. (): "The obstacles to measuring the consequences of the computerization of public administrations", 26p.
26. Lefebvre L. (forthcoming): "Logics of efficiency in the road transport of goods: an approach by configuration of services", thesis for obtaining a doctorate in economics, 326p.
27. Lorino P. (1989): "the economist and the manager", Editions la Découverte, Paris
28. May N. (): "Service production and service relationship: some analysis perspectives. Mesnard, X. & Dupont, A., (1999), "Is your logistics at the forefront", L'Expansion Management Review, September, pp. 52-59.
29. Morana J, Paché G. (2000): "supply chain management and forward-looking dashboard: in search of synergies", published in the journal Logistique et Management, vol 8, n ° 1, pp77-88 Morin et alii (1994): "The efficiency of the organization: theories, representations and measures", Gaëtan Morin Editor
30. Paché G. (2000): "Identifying changes in the logistics channel: some major challenges from a marketing perspective", International Conference on Marketing Trends in Europe, Venice, November
31. Paché G, Sauvage T. (2004): "Logistics: strategic challenges", Vuibert, October, 178p. Pecqueur B. (2003): "under what conditions can heritage objects be used for activity", communication to RESER, October7p.
32. Pecqueur B., J.B. Zimmermann J.B., ed., 2004, L'économie de proximités, Paris: Hermes-Lavoisier editions, 264 p.
33. Petit P. (2002): "The notion of productivity, from one growth regime to another", La lettre de la Régulation n ° 43, December
34. Perroux F.: "economic spaces", Applied Economy n ° 1
35. Pimor Y. (1998): "logistics: techniques and implementation", 2nd edition, DUNOD, Paris, 575p.
36. PRTM, Cohen S., Roussel J. (2002): "supply chain advantage", Organization edition, performance / quality coll, September, 406p.
37. Scott W.R. (1977): "effectiveness of organizational effectiveness studies", in P.S. Goodman and J.M. Pennings, New Perspectives on organizational effectiveness, Jossey-Bass
38. Seashore S.E. (1979): "Assessing organizational effectiveness with reference to member needs", Meeting of the academy of management
39. Stapleton D. Et alii (2002): "Measuring Logistics Performance Using the Strategic Profit Model", International Journal of logistics management, Vol 13, No. 1, pp. 89-107
40. Viner J. (1932): "The Doctrine of Comparative Costs", WWA
41. Zimmermann J.B. (coord), Gilly J.P., Pecqueur B., Perrat J. (1995), "The territorial anchoring of industrial and technological activities", Report to the General Planning Commission.

World Economics & Finance Bulletin (WEFB)
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