

Validity Analysis of Performance Indicators for Postal Service

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I. Introduction

At the end of the twentieth century, technological revolution and globalization substantially changed the way postal services were regulated by the government. Separation of service provision subjects from the government, abolishment of postal monopoly, and securing market access are major examples of such postal reform waves. However, governments have had to contend with incentive problems — more specifically, have postal operators been forced into unprofitable businesses as part of their universal service obligation? As a result, increasing numbers of countries have set up independent postal regulators supervising the provision of postal services. In this context, performance measurement by postal regulators is a significant part of postal regulation and postal reform.

Current postal performance measurement is regarded as inadequate (wik-Consult, 2003). Independent postal performance measurement is restricted to a few European nations and the United States. In most countries, postal operators control performance measurements internally rather than having postal regulators develop and introduce effective measurement systems externally.

The performance indicator is the core element of performance measurement. Indicators should be developed to reflect accountability and quality in the universal postal service and ensure that measurements are transparent,

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independent, and impartial. The current use of performance indicators and research on performance indicators is not acceptable, since these indicators are those implemented by postal operators. It is not clear whether such indicators can reflect the true needs of government. Additionally, there is a lack of theoretical analysis on the validity of said indicators. This research therefore tries to answer the question, from the view of postal regulators, can performance indicators for the postal service be systematically and appropriately developed?

This paper analyzes the validity of performance indicators for postal service systems adopted in five sample countries. These five countries include the United States, the United Kingdom, France, the Netherlands, and Belgium. The research attempts to expand knowledge on the current adoption of performance indicators for the postal service as well as propose a comprehensive system of performance indicators for postal regulators.

We will first summarize existing literature on currently utilized performance indicators in Section Two. The appropriate research method for the analysis of indicator effectiveness is discussed in Section Three. In Section Four, indicators adopted by sampled postal regulators are summarized and both the validity and the reliability of the indicators are discussed. Based on the major findings from Section Four, Section Five discusses the possibility of establishing a comprehensive indicator system for the postal service. Finally, we make the conclusions and recommendations for the establishment of a comprehensive system in Section Six.

II. Literature on the Postal Performance Measurement

Performance measurement in the public sector can be traced to the late 1800s (Heinrich, 2003). Over the centuries, measurement became increasingly popular in public sectors, resulting in several measurement systems that are still in use today. Performance measurement determines the success of performance management. Institutional performance measurement can be regarded as ‘the process of defining, monitoring, and using objective indicators of the performance of organizations and programs on a regular basis’ (Poister, 2003, p

1). Within the context of performance management, performance measurement systems include a number of indicators. According to Marr (2009), performance indicators help us obtain evidence and information of the system under study. This information can be turned into fresh insight and learning of that system, giving support to decision-making that improves organized performance.

Performance indicators should have certain properties; existing literature has helped us identify these properties. Table 1 compares several theories that should be considered when selecting performance indicators. Most theories suggested both individual indicators and the entire set of indicators should be assessed against several criteria. Ammons (1995) and Marr (2009) regard *Validity* as one of the most crucial criteria when choosing indicators, which means that the indicators should reflect what is supposed to be measured.

Table 1. Comparison of the Criteria for Performance Indicator Selection

Ammons (1995)	Marr (2009)	OECD (1994)	Governmental Accounting Standards Board (1994)
Valid	Validity of this indicator		Relevance
Reliable			Reliability
Understandable			Understandability
Timely			Timeliness
Resistance to perverse behavior	Avoiding dysfunctions or cheating behavior	Avoiding unintended consequences	
Comprehensive		Output measure should reflect as much as possible	
Non redundant			
Sensitive to data collection cost	Cost of measurement	At reasonable cost	
Focused on controllable facets of performance		Not be influenced by factors other than the performance	
		Homogeneous and comparability	Comparability and Consistency

However, performance measurement for the postal service is at an infant stage. In practice, only some European countries and the United States have begun implementation of a performance measurement system within the postal

sector. The selection of indicators has traditionally been based on historical experience or political requirements. Postal regulators face a difficult task of finding practical and measurable indicators for performance measurement. Moreover, research for the selection of performance indicators for the postal service is not sufficient.

III. Research Design

In the previous section, we have shown that relatively few studies exist on the specific use of indicator systems for the postal service. Accordingly, we engage survey research as the most appropriate method for this study. This research selects sample countries, collects adopted indicators, observes the system designs of the indicators, analyzes their effects, and then explores the universality of the successful indicators as well as the uniqueness of each country's adoption.

Considering the diversity of postal reform in the world, five sample countries were selected according to the degree of postal liberalization. Usually, postal operators can be classified into four types after postal reform: the independent governmental agency, the fully state-owned public company, the partly state-owned company, and the fully privatized company. On the other hand, postal regulators can be grouped into two categories: those that regulate the postal service alone and those that regulate both the postal service and the electronic communication service. In all countries experienced postal reforms recently around the world, the selected countries – the United States, the United Kingdom, France, the Netherlands, and Belgium – cover all of the above types of postal operators and regulators.

The adoption of indicators for performance measurement can be observed in postal regulators' annual reports. The indicators highlighted in these reports are key instruments of measurement for the postal service, reflecting the values monitored by the government. They can therefore be regarded as indicators for the postal service from the government's point of view. The related annual reports include the following regulators' annual reports:

— *Annual Compliance Determination of U.S. Postal Service Performance 2009* by the Postal Regulatory Commission (PRC) in the United States.

— *Annual Report 2009-10* by the Postal Services Commission (Postcomm) in the United Kingdom.

— *Annual Report 2009* by the Autorité de Régulation des Communications Electroniques et des Postes (ARCEP) in France.

— *Annual Report 2009* by the Belgian Institute for Postal Services and Telecommunications (BIPT) in Belgium.

— *Annual report and Market Monitor 2007* by the Independent Post and Telecommunications Authority (OPTA) in the Netherlands.

Langbein and Felbinger (2006)'s framework was adopted as one of the criteria for analyzing the validity of indicators. It separates measurement validity into two criteria: validity and the reliability. 'The difference between measurement validity and reliability is that valid measures have as little systematic or nonrandom measurement error as possible, while reliable measures have as little random measurement error as possible' (Langbein & Felbinger, 2006, p 35). Based on this classification, this research assesses the validity of postal indicators by whether they are systematically appropriate for performance measurement. On the topic of reliability, this research focuses on whether indicators can accurately reflect the performance to be measured.

IV. The Validity of Performance Indicators for the Postal Service

1. Performance Indicators

As a traditional governmental sector and a crucial public service, the structure of the postal service is different from country to country due to the historical development and political economy in each country. Institutional arrangements, legislation, measurement methods, and the number of indicators employed are all examples of the considerable differences that exist within the performance measurement systems of the sample countries.

Table 2. Comparison of Postal Systems in Sample Countries

	USA	UK	France	Belgium	Netherlands
Territory(Km ²)	9,629,091	242,900	551,500	30,528	41,528
Population (millions)(Y2008)	308.798	61.019	61.946	10.647	16.592
Postal Regulator	PRC	Postcomm	ARCEP	BIPT	OPTA
Regulating Scope	Postal service	Postal service	Post and Telecommunication	Post and Telecommunication	Post and Telecommunication
Postal Operator	United States Postal Service (USPS)	Royal Mail Group plc.(Royal Mail)	La Poste(France)	La Poste(Belgium)	TNT N.V.(TNT)
Type of Operator	Independent government agency	Public limited company wholly owned by the Government	Public limited company wholly owned by the Government	Public limited company with 50% plus one shares owned by Government	Fully privatized, traded on the <i>Amsterdam Stock Exchange</i> .
Number of Postal Staff (Y2008)	765,088	177,498	260,030	39,373	56,880
Number of Post Office (Y2008)	36,723	11,952	17,082	1,358	3,150
Number of Indicators Surveyed	17	11	9	4	8

Note: The data of territory, population, number of staff, and number of post office in each country is from the Postal Statistics on the website of Universal Postal Union (www.upu.int)

Table 2 illustrates differences of the sample countries by comparing territory size and population as well as the operational scope of postal regulators, the types of postal operators, the number of postal staff, and the number of post offices. The territory and population of the country reflect basic serving conditions for each postal operator. The operational scope of the postal regulator affects the extension of regulation in each country, while the type and scale of the postal operator represents the position of the postal operator in each country's political economy. The differences in the postal systems of each country cause differences in the manner under which performance measurement systems are adopted in each country.

There are a number of similarities among these countries as well. The current practices of performance measurement are mainly based on formal performance reporting activities. Performance targets are often negotiated in management contracts between the postal operator and the state or are regulated by a government ministry. Postal regulators confirm performance indicators

for measurement and detail reporting requirements for operators. During this evaluative process, postal regulators mainly supervise the procedure and methods of measurement. After the submission of the reports from operators, postal regulators review the reports and then publicize their results. Beside these normal duties, regulators occasionally undertake independent investigations of the postal service. Results of independent investigations are also part of the measurement process, which are publicized or reported to the minister in charge. Therefore, the responsibilities of postal regulators in the practice of performance measurement are similar across countries.

Figure 1. Responsibilities of Postal Regulators in Performance Measurement

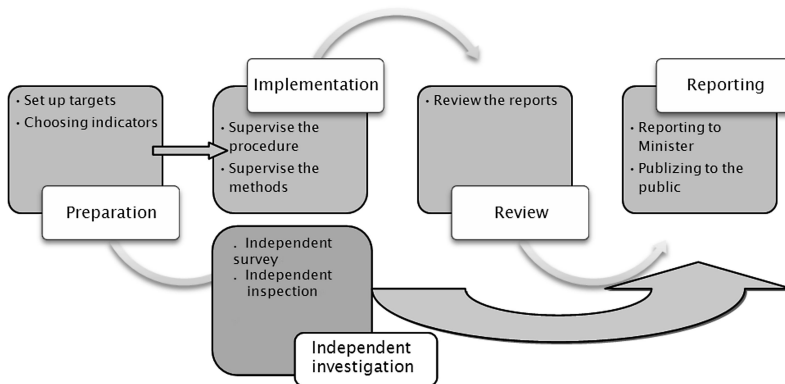


Figure 1 illustrates the performance measurement process and the responsibilities of postal regulators. Choosing indicators is an important step for the preparation and success of performance measurement.

By looking through annual reports issued by the postal regulators, indicators can be divided in 11 groups. They measure cost, productivity, profit, revenues, volumes, transit time, safety, frequency, complaints, public access, and customer satisfaction. These groups can be categorized in four series: indicators measuring financial performance, measuring service delivery, measuring service quality, and measuring satisfaction. These key indicators are listed in Table 3.

Table 3. Key Indicators for Postal Service

Series	Group	Key Indicators	NL	UK	FR	BE	US
Financial Performance	Cost	Total Cost	○				○
		Cost per Piece of Mail					○
	Productivity	Changes in Work hours					○
		Total Factor Productivity					○
	Profit	Net Income / Loss					○
		Monopoly Profit	○				
		Other Mandated Service Profit	○				
	Revenues	Total Revenue	○				○
		Revenue by Product			○		○
Revenue per Piece of Mail						○	
Service Delivery	Volumes	Total Volume		○			○
		Volume by Product	○	○	○		○
		Volume Growth Rate		○			○
		Market Share	○	○			
Service Quality	Transit Time	General Quality of Delivery Speed				○	
		Percentages of Categories of Postal Service Delivered on Time	○	○	○		○
	Safety	Percentage of Items Delivered Correctly		○			
	Frequency	Percentage of Mails Delivered by Postcode Area		○			
		Percentage of Collection Points Served Each Day		○			
		Percentage of Delivery Routes Completed Each Day		○			
		Total Numbers of 3-Digit Zip Code Upgrades and Downgrades					○
		Number of Letter Box with Latest Posting Time by certain time			○		
	Public Access	Total Number of Post Offices	○	○		○	○
		Total Number of Delivery Points				○	○
		Average Wait Time in Line					○
	Complaints	Number of Complaints			○		
		Relies within a certain period			○		
		Complaints as Percentage of Total Flow			○		
		Complaints Giving Rise to Compensation			○		
Degree of Satisfaction with the Treatment of Compensation				○			
Satisfaction	Customer Satisfaction	Combined Customer Satisfaction				○	
		Score of Satisfaction by Customer, SMEs and Business		○			
		Customer Satisfaction by Categories of Products					○

Note: NL refers to the Netherlands, UK refers to the United Kingdom, FR refers to France, BE refers to Belgium, and US refers to the United States

Characters of these indicators can be analyzed as follows. First, they are different from the traditional postal statistics indicators. Second, they offer

feedback on how well the system operates by looking at the quality and the quantity of services rendered. Third, they focus on the universal postal service but care little about competitive services. Fourth, they take into account the whole process of the postal service, but are more concerned about outcomes and the effectiveness. The new indicators are reflective of the public's need for accountability within the postal service.

2. Indicators for Financial Performance and Service Delivery

There is a large gap between regulators of financial responsibility and service delivery. The most comprehensive indicator for financial performance appeared in the annual report of the PRC of the USA. PRC measures the United States Postal Service's (USPS) financial performance from the following three points: fair allocation of cost, efficiency of operation, and financial stability. The role of OPTA of the Netherlands is 'to determine whether its (the TNT's) profit had increased or decreased in relation to its concession' (OPTA, 2008, p 20). Postcomm of the United Kingdom focuses on investigating 'the state of the market' (Postcomm, 2010, p 20). In France, ARCEP assumes responsibility of the financial performance and service delivery of La Poste (France) by developing knowledge of the economic situation and the markets. As for BIPT of Belgium, no particular indicator for financial performance of La Poste (Belgium) was found in its annual reports.

The identity of postal operators decides the responsibility of postal regulators when measuring their financial performance. Since USPS is a governmental agency, the government has the need and authority to measure more aspect of USPS's financial performance than countries where privatization reforms have taken place. Competition among postal operators affects the scope and extension of how postal regulators measure financial performance. In the European Union, postal regulators supervise the whole postal market and fair competition in the market receives more attention than the success of one operator's financial performance.

(1) Validity Analysis on Indicators for Financial Performance and Service Delivery

When selecting indicators, a comprehensive analysis of postal service inputs, processes and outputs is undergone, and indicators are chosen partially for their ability to analyze distinct phases of the overall postal system process. Some indicators always play a more important role in the system, while others act in complementary roles. Almost all of the indicators hold a special position within the measurement system. Indicators of 'revenue per piece of mail' and 'cost per piece of mail,' however, are useless in the system. Moreover, although indicator overlap exists to some extent, the principal remains that different indicators measure different objects.

From the aspect of system design, measurements always focuses on one point or perspective of the postal service, thereby avoiding disturbances from external matters. For example, PRC uses Total Factor Productivity (TFP) to measure the efficiency of operation and uses Net Income/Loss to measure profitability.

Another finding about the system's design is that even with similar objects of investigating, the systems of measurement may be different. For example, different approaches are used when showing the state of the postal market in the United Kingdom and France. One approach takes into consideration the whole market, introducing market size, trends, share and competition as relevant factors. The other approach takes a narrow or segmented point of view by selecting representative parts of the market.

However, the validity of indicators for financial performance and service delivery does not satisfy the conditions of the research presented in this paper. Only the PRC of the United States has set up targets for financial performance and uses the indicators to make evaluations. Other countries only use these indicators to help them make decisions (such as in Netherlands), or as a benchmark reference to understand the situation of the postal market.

(2) Reliability Analysis on Indicators for Financial Performance and Service Delivery

The source of indicators for financial performance and service delivery are mainly from the reports of postal operators. For example, indicators for financial performance and service delivery in the annual report of PRC of the United States are mainly taken from *USPS Annual Report*, *USPS Form 10-K*, *USPS Revenue, Piece, and Weight (RPW) Reports*, *USPS Annual Compliance Report*, and the *Postal Service Annual Tables*. Especially, the *Form 10-K* is an annual report contains a comprehensive summary of the company's financial performance, including the audited financial statements. The unavoidable consequence is that the provider of the information is the one to be measured. The impartiality of the information and indicators should therefore be challenged.

Against this backdrop, reporting requirements have become a sort of compromise. To this end, postal operators have an obligation to provide their regulator with statistical information about their financial performance and service delivery. The regulator decides upon the content and type of the statistical information being provided. In this way, the authority and impartiality of information are ensured. Other ways to guarantee accuracy is through *ex post* auditing and independent inspections.

The acceptable aspect is the accuracy of these indicators. Indicators of financial performance and service delivery are quantity indicators. The statistics and accounting are the most traditional practice, and the methods and rules are scientific and rigorous.

The common problem lies in different perspectives between using information for business and for public policy making. The can be seen in the methods of accounting used and the statistics that are generated. Although regulators can require postal operators to submit detailed information, postal operators can and will exaggerate accounting limitations and/or costs. For example, TNT, the postal operator in the Netherlands, submits a concession annual report to OPTA on its monopoly services and those duties that it was

charged to perform. The report requires the inclusion of relevant financial details. OPTA noticed that the manner TNT accounts for its pension expenditure in the report actually failed to reveal structural changes to its concession result. TNT has refused to make its pension expenditure more transparent. OPTA therefore has a difficult time determining whether TNT's profit has increased or decreased in relation to its concession. OPTA did not have power to enforce transparency at TNT; it was only able to notify the State Secretary for Economic Affairs accordingly.

Generally, the reliability of indicators for financial performance and service delivery is acceptable, since quantity indicators are objective and easy to audit. On the other hand, regulators need to satisfy the requirements of the reporting by ensuring that indicators are useful measurements.

3. Indicators for Service Quality and Customer Satisfaction

Compared with the largely diverse responsibility for financial performance measurement among postal regulators, ensuring the provision of a quality universal postal service is a core task of all postal regulators. In the United States, maintaining a quality service standard is one of missions of the PRC. To achieve this goal, the PRC reviews USPS's performance in the areas of transit time and customer satisfaction according to *the Postal Accountability and Enhancement Act 2006*. Measuring service quality is one of the tasks of Postcomm in the United Kingdom as well, 'securing the universal service and protecting postal users' (Postcomm, 2010, p 6).

Supervising the quality of service is also an important role of ARCEP in France. There, quality targets are set by ministerial order. In the *Decree on the universal postal service and the rights and obligations of La Poste and amending the Post and Electronic Communications Code*, service quality is regulated through the measurement of mail transmission times, complaint handling, and postal office wait time. As for supervising service quality in Belgium, BIPT supervises the implementation of the universal service obligations and the management contract between the state and La Poste (Belgium) (Verhoest, Sys,

& Leuven, 2006). In the Netherlands, OPTA's responsibility in the postal sector is limited to monitoring whether TNT's provision of services meets the legal requirements (Dieke, Niederpruem, & Campbell, 2008).

Here, we may make several conclusions regarding responsibilities of postal regulators in the field of service quality measurement. First, all postal regulators in sample countries have the responsibility of securing the quality of the universal postal service. Second, most countries utilize the service standards of the universal postal service in their national postal legislation or establish service quality targets by negotiation or ministry decrees. Third, among sample countries, choosing indicators to reflect service quality performance in the postal service reveals a certain consistency.

(1) Validity Analysis for Service Quality and Customer Satisfaction

The use of indicators for service quality and customer satisfaction is nearly identical in sampled countries. Validity analyses are taken in two levels. The first level is to discuss *systematic* validity of these indicators and to answer the question of 'can these groups of indicators help to ensure the service quality of a universal postal service'. The second level is to discuss *individual* validity of indicators in each group and to answer the question 'can these indicators reflect the true service quality of a certain aspect'.

Systematically speaking, there are two perspectives in the indicator system. One is the postal operation perspective and the other is the postal users' perspective. The current indicators for service quality are closely connected with postal production. The measurements tend on information related to internal postal production, while less external information about outcomes of the postal service is included. Besides customer satisfaction ratings, only customer surveys can partly reflect some of the concerns of postal regulators. The main indicators are from the internal quality control mechanism, plus the external customer satisfaction data.

The individual validity of each group of indicators is also crucial, and six groups of indicators have been employed to reflect the validity for service quality

indicators: transit time, safety, frequency, public access, complaints, and customer satisfaction. In each group, several key indicators and further sub indicators are introduced.

The individual validity of each group of indicators has been found to be different. In the group measuring transit time, three types of measurement systems are used in the sample country pool. All of them have certain advantages as well as weaknesses. Generally speaking, however, this detailed approach to the measurement system reflects a more comprehensive picture of transit time performance.

The necessity of the measuring frequency group is questionable, although postal regulators have tried to increase the reliability of this indicator by measuring the service frequency from more technical aspects. As long as the working hours of delivery teams conform to legal requirements, service frequency can be ensured from a quantity perspective. Since the frequency of postal service is difficult to measure, it should be considered in the measurement of transit time. In the measuring safety group, the indicator 'the percentage of items delivered correctly' is not sufficient, because most mail is not registered mail. Only registered mail and insured mail have proof of mailing and can therefore be tracked. In the group measuring public access, there are some attempts to change indicators from operation-oriented to customer-experienced. The ARCEP and the PRC use 'post office waiting time' to measure the density of post office. It is a more scientific measure than statistic indicators, such as the serving population of each post office.

The design of indicators for the group measuring the treatment of complaints is mature and effective. Finally, in the group measuring customer satisfaction, many attempts have been made to provide comprehensive information about public opinion. On the other hand, the relationship among indicators and the problem of how to link the performance measurement to customer satisfaction still needs to be studied.

(2) Reliability Analysis for Service Quality and Customer Satisfaction

The reliability of indicators can be analyzed in three ways: authority, impartiality, and accuracy. Tests for service quality usually happen with the measurements of transit time, safety, frequency, and public access (when measuring ‘post office waiting time’). Information about public access (when measuring ‘number of post offices’) and complaint treatment are often taken from statistical data. Customer satisfaction data are obtained from public surveys. A note of interest is that most of the information on service quality and customer satisfaction is obtained through the reporting requirements for postal operators. Operation-oriented indicators make postal operators the only authority of providing information needed for measurement.

A serious problem is the impartiality of service. Among sampled countries, only Postcomm utilizes a customer satisfaction survey in the United Kingdom. Other information about service quality and customer satisfaction in all sample countries is taken directly from the reports of the postal operators.

Ensuring impartiality in the measurement system is based on three mechanisms. The first is the design of the indicators. The choice of indicators will affect the result of the measurement. Comprehensive and objective indicators can reflect the true status of service quality. At present, the participation of postal regulators is ensured when designing indicators. For example, indicators for service quality are established in ‘*Amended Licence Granted to Royal Mail Group plc*’ in the United Kingdom in 2006 and the Public Contract that was signed between the State of France and La Poste (France) in France in 2008.

The second mechanism is the choice of testing methods. The scope of testing, sample selection of testing, and market segmentation of customer satisfaction will all affect the impartiality of measurement. In almost all sample countries, methods of measuring service quality need certification by postal regulators. While no direct relationship between the postal regulator and external testing companies exists, such relationships between postal operator and external testing companies are common.

Finally, supervision is necessary in the measurement to prevent fraud. For example, in the United Kingdom, the Royal Mail was found trying to identify independent testers for service quality by matching spreadsheets with their names and addresses. These spreadsheets were used to ensure testers received their letters in good time, so that performance targets were met (Postcomm, 2010). Nevertheless, fraud is not the biggest threat for accuracy when measuring service quality.

Accuracy of the information gathered for service quality is highly dependent on the cost of obtaining the information, the methods of measurement, and the technical limitation involved in the measurement. The more reliable this information is, the more expensive it will be. Moreover, some indicators are inherently difficult to count. For example, indicators of safety, such as the number of pieces of mail that is lost, are difficult to count, because most mail is not registered (only registered mail and insured mail has proof of mailing). Therefore the method of measurement is very important for the accuracy of indicators. Take transit time test as another example: the United States carries out the best practice of measuring transit time for postal services. Various measurement systems are used from both external and internal aspects (PRC, 2010).

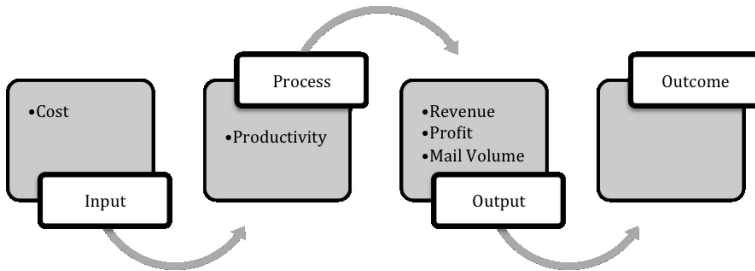
If using the experience of the United States as a guiding benchmark, principles of ensuring accuracy for measuring service quality can be elaborated as follows. External measurements have priority over internal measurement. Because the experience of the customer is focused on measurement, the internal measurement cannot reflect service quality received by customers. Second, in the external measurement, the way of selecting samples to be tested should be fully considered. Usually, it is based on the calculation of mail volume, market need, geographic coverage and population coverage, as well as the coverage of various postal services. Third, when necessary, the internal measurement can be used as complementary system to the external one, although the supervision of internal measurement is necessary.

V. Discussion on Setting Up an Integrated Indicator System

There are a number of possible and well-found indicator systems. All sample countries have established their own unique indicator system for the postal service. This partly persuades this research team that there is no optimal indicator system. Different responsibilities of postal regulators, legal requirements, market conditions, as well as political environments affect the formation and eventual adoption of an indicator system. Four series of indicators are found, which showcase how difficult it is to measure the performance of the postal service with one indicator, one type of indicator, or one group of indicators.

The structure of indicators for financial performance compared to the structure of indicators for service quality is different. As we have seen so far, indicators for financial performance and service delivery can be structured with dimensions of four groups during service production: input, process, output, and outcome (See Figure 2).

Figure 2.
Current Structures of Indicators for Financial Performance and Service Delivery

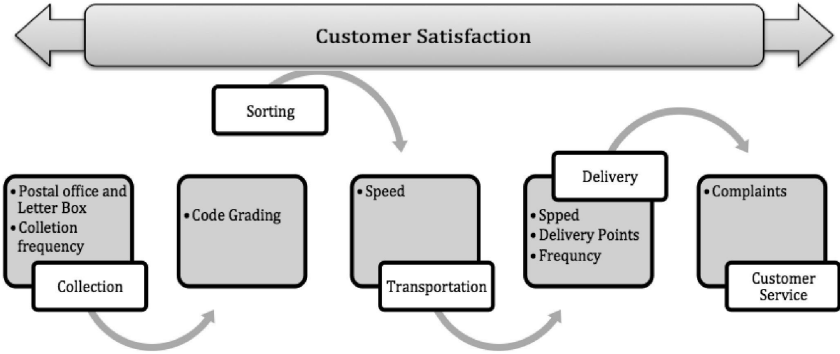


Although it is possible to group all kinds of indicators into this Input-Process-Output-Outcome (IPOO) classification, when building an index of indicators of a certain industry or sector, it is not recommended to simply list the indicators by category of IPOO. ‘Because of the interrelationships and trade-offs between objectives and the multidimensionality of outputs and outcomes, it

is not possible nor would it be operationally advantageous to develop a matrix of indicators for inputs, process, outputs and outcome vis-à-vis objectives in the rigid manner' (OECD, 1997, p 22). Moreover, in this structure, the function of postal regulators and shareholders are mixed together. The value of market competition and concerns regarding the fair allocation of the cost of universal postal obligation did not appear in the structure.

On the other hand, indicators for service quality and customer satisfaction are structured out of the postal operation processes: collection, sorting, transport, delivery and customer service (See Figure 3). Such an operation-oriented indicator structure is closely connected with the postal operation, measuring the situation of each process that possibly affects service quality.

Figure 3.
Current Structures of Indicators for Service Quality and Customer Satisfaction



An isolated indicator system has a number of problems. One of its greatest barriers is that it ignores relationships between financial performance and service quality. The current system lacks the important contribution of postal regulators. To solve these issues, this research proposes an integrated indicator system. One way to integrate these separate indicator systems together is to combine them with the postal regulator's viewpoint in mind. The sustainability

of postal operation is the foundation of providing universal postal service, while service quality is a crucial outcome of universal postal service.

Theoretically, a certain relationship should exist between these two groups. The absence of their relationship in the indicator system implies the absence of performance-based subsidy policies in the universal postal service. Successful cases of performance-based policy in other public utilities have forecasted the possibility of closer relationships existing between different indicator series within the postal service (Ladd, 1996; Fearnley, Bekken, & Norheim, 2004).

Considering the separated relationships between indicators for financial performance and indicators for service quality, the role of the postal regulator is a possible channel by which to link them together. Measurements by postal operators are still necessary to provide a comprehensive portrait of the postal service, especially with regard to financial performance and service quality information that reflect the productivity and the profitability of the postal service. Users are one of the major stakeholders. Customers particularly focus on the service quality experienced and the satisfaction with this system. The role of postal regulator is to combine these two aspects to measure the efficiency and effectiveness of the service.

The current separation results from the unclear responsibility of postal regulators in the field of financial performance. Domestic politics can sometimes affect the institutional arrangement of postal regulators greatly (Campbell, 2002). Another complicated task is the technical difficulty involved in finding special indicators that can combine financial performance and service quality together. However, attempts must be made to find such indicators by focusing on modifying indicators to increase validity and/or using new indicators for the postal service. New indicators might make the indicator system more understandable. Postal regulators are currently considering both avenues. Promoting the privatization of the postal market is another possible solution to enhance service quality (wik-Consult, 2003). The major mission of the postal regulator is not merely checking performance but ensuring the quality of the universal postal service.

VI. Conclusion

In reviewing the performance indicators for the postal service with special attention on the categories of validity and reliability, the following findings and suggestions can be summarized:

— All of the sample countries had adopted an indicator system to measure postal performance. It is not possible to measure postal performance with a single indicator or a single type of indicator.

— The comprehensive indicator system can be composed through a series of four indicator types: financial performance, service delivery, service quality, and customer satisfaction. These types measure 11 aspects of the postal service: cost, productivity, profit, revenue, mail volume, transit time, mail safety, frequency, public access, complaints, and customer satisfaction.

— Performance measurements in the sampled countries are fairly well designed in the area of service quality; on the other hand, less emphasis was placed in the area of financial performance. There is little interrelationship between indicators for financial performance and indicators for service quality. While more detail was provided for indicators measuring service quality, little relationship was observed between indicators in different groups. Further, the little consideration of priority to each indicator is presented in sampled countries.

— The group of indicators for financial performance and service delivery is based on the traditional Input-Process-Output-Outcome structure. Because of inconsistencies in the postal regulators' responsibility for financial performance, the systematic validity of this group was weak. Most of sample countries only used this structure to reflect the basic status of the postal market. On the contrary, the reliability was comparatively strong.

— The group of indicators for service quality and customer satisfaction is based on the operational Collection-Sorting-Transport-Delivery-Customer Service Structure. Clear targets for service qualities and the full consideration of customer experience ensure systematic validity. The wide use of indicators to monitor customer complaints and satisfaction reflected the transition from operation-oriented to customer-experienced measurement models. Reliability,

however, was comparatively weak. The limitations of methods measuring service quality are widely recognized.

— The largest, current issue is the absence of connecting the results of indicators for financial performance and indicators for service quality together. There is no interrelationship between indicators, leaving indicators in each group comparatively independent and self-evident. The limited reach of the postal regulators is the cause of this system weakness. The absence of postal regulator-initiated indicators seemed to pose the biggest hurdle for the current indicator system.

— Setting up an integrated indicator system seems to be an available solution. From the view of the postal regulator, the efficiency and the effectiveness of postal service are to be emphasized. Other possible solutions with supplementary activities should be also considered, such as modifying and innovating new indicators to increase validity and promoting the healthy competition of the postal service.

Finally, this survey research is comparing the adoption of indicators in different countries so that logical validities of indicators for the postal service can be analyzed. However, analyses of other aspects are also necessary in the future. Quantizing analysis of indicators to decide the proportion of each indicator in the packaged measurement and the historical comparison research to appeal the capacity of each indicator in reflecting the growing trend of the postal service might be two main areas in the research of performance measurement of the postal service that need further exploration.

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Validity Analysis of Performance Indicators for the Postal Service

<Summary>

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The intent of this research is to expand knowledge of the performance indicators currently utilized by the postal service as well as propose a comprehensive system of performance indicators for postal regulators. This paper scrutinizes the validity of performance indicators for the postal service organizations of the United States, the United Kingdom, France, the Netherlands, and Belgium. A full review on annual reports published by the postal regulators in the above five countries was undergone. The analysis of validity centered on two key criteria: the validity and the reliabilities of indicators.

Key findings include the adoption and systematic problems of performance indicators in the sampled countries. While wide adoption of performance indicators was found, the internal validity and reliability had limitations. The largest hurdle for the current system is the small correlation between indicator groups, reflecting the absence of the postal regulators' perspective. The clearly defined responsibility of postal regulators, the purpose-oriented and scientific-measure based design of the indicators, and the full participation of the public during measurement are necessary activities to enhance the validity and reliability of the performance indicator system.

The possibility of setting up an integrated indicator system for the postal service is discussed after the research findings have been presented. The proposed integrated indicator system provides a comprehensive portrait of this industry. The difficulties and challenges of establishing such a system are acknowledged, but supplementary works will ensure its feasibility.