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CONTENTS

AN INTERPRETATION OF CONVENTIONAL ACCOUNTING INCOME INFORMATION

Isao NAKANO

The purpose of this article is to explore a semantic content of conventional financial accounting information, especially net income information, which generally arises from (a) the recognition of annual revenue on the "sales basis", (b) inclusion in periodic expenses of the valuation losses by the "lower-of-cost-or-market" rule and (c) the emphasis of "normality" in measuring acquisition costs. One of the meanings of historical cost valuation may well be understood by the idea of the "maintenance of nominal capital". Semantic difficulty and complexity with current accounting data seems to emerge when we try to interpret the information outputs from simultaneous application of the above three measurement procedures.

Obviously, actual financial accounting measurements are predicated upon much more than those three characteristics. Their isolation is admitted to reflect our "bias", and thus we will be studying a simplified model of accounting practice, not the actual accounting measurement system as an integrated whole.

1. Utilization Value versus Ownership Value of Goods and Services

In considering the value concepts of economic resources, Ijiri insists that they are composed of "benefit" value and "sacrifice" value, and that they have opposed characteristics as utility and disutility.[1] Specifically, obtaining an economic resource usually demands a sacrifice (cash payment of one hundred thousand yen, for example), which is a sacrifice value. By contrast, goods give the possibility of providing a benefit (e.g. satisfaction of one's wants by direct consumption, or incoming of money by sale), which we call "benefit value".

We suspect, however, that these two aspects are not so diametrically opposed in reality. It is so because the sacrificed cash expenditure is a sort of utility in that the resulted ownership of the good obviates, unless it is lost by the firm, further payment of the same amount of money just for maintaining the invested monetary capital. In other words, cash paid is a disutility only if considered as an isolated event, whereas it is a utility when the state of a good being obtained (and held) is compared with another possible state of the good being deprived by theft or sale

1) Y. Ijiri, The Foundation of Accounting Measurement, Prentice-Hall, Inc., 1967, pp. 57–58.

which would have resulted in the loss of the money connected with the good.
[Example]

Assume that a firm acquired an economic resource for payment of a hundred thousand yen. If the good should be somehow lost again, the firm could not maintain the monetary capital entrusted by the investors and not account for good stewardship to them unless the lost money identified with the good deprived (or the good per se) would not be replaced from any additional fund source such as a donation or sales revenue. Accordingly, as far as the good is in fact safely being held by the firm, the past expenditure of one hundred thousand yen represents an advantage (a sort of benefit as "money saving") which generates from the unnecessity of compensating the assumed deprival loss of money from another source.

We thus conclude that in the last analysis the so-called "benefit value" as well as "sacrifice value" both reflect a desirableness or advantage with respect to the good obtained. The former will be called "utilization value" for it derives from using the resource. The sacrifice value, on the other hand, finds its utility in holding, not losing, the good, so that we may properly designate it "ownership value".

Our discussions to follow are oriented towards consistently explicating a semantic content of conventional financial accounting information as a reflection of "ownership values" of the firm's assets and their changes.

2. A business income concept as a difference in ownership values and the sales basis

Relying upon the above analysis, "ownership value' of a good will be defined, from the perspective of maintenance of nominal monetary capital, as the sum of money which is deemed as invested in it and which would be regarded as lost if the good were deprived.[2)]

A corollary of this definition is that ownership value must be potentially "recoverable" from current or future cash inflows. If a part of money invested in an asset were now judged as irrecoverable, it would mean that the loss had been induced by some extant factor(s) such as its value (or price) change or obsolescence, and not by the assumed deprival. In this sense, that part of invested money would not belong to ownership value.

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2) Such ownership value concept—defining a good's value as "money saving from its avoiding deprival"—is the product of our extension of the "deprival value" concept as adopted in the current cost accounting proposal by the Sandilands' Report. (Cf. Report of the Inflation Accounting Committee, Inflation Accounting (Sandilands Report), Her Majesty's Stationary Office, London 1975, pp. 58–61).

Let us apply this value concept to asset measurements.

(1) With respect to a firm's monetary assets such as cash, accounts receivable, notes receivable etc., their amounts net of the expected bad debt losses are the money being invested in their respective asset forms—"invested" in the sense that those monetary claims consist in "lending" occasioned by the selling, etc. (As for cash, its total amount simply is what remains invested.) Thus, the "ownership value" of each asset, i.e., what would need to be replenished on deprival for maintaining nominal monetary capital, can be measured by the net monetary amount of the asset (or by the total sum in case of cash).

(2) How can we approach "ownership values" of intermediate goods (W) in the firm's money circulation process G→W→G'? Normally, a progress in processing activities (from raw materials through goods in process to finished products) will add to their economic values in the sense of their estimated net realizable values or their present values. But this sort of value is a mere reflection of future probable money inflow, not of the actual invested money in the goods. Therefore, its amount can never show our ownership value. On the contrary, this is estimated at the recoverable part of the total historical acquisition prices of the economic resources (production factors) consumed up to the present stage.

Note a circulation of monetary capital, "cash→raw materials→goods in process →finished products→accounts receivable→cash". In every stage of goods until the finished products, the ownership value is normally measured, as stated above, by the total invested money in the consumed production inputs. Thus, historical acquisition costs are appropriate valuation bases for all goods up to the finished goods, so long as that total amount can be expected to be recoverable. Upon converision of the products into accounts receivable by a sale, the ownership value of the receivable is now equal to its net money amount. When accordingly a difference emerges between the acquisition cost of the product and the net amount of the receivable (i.e., its recoverable amount), this stage of "products to the receivables", that is, the sales stage, is seen to be the time point when the major income of a company is to be recognized and measured. This in turn suggests that a consistent measurement and application of "ownership value" for all resources in each stage of G→W→G′ will naturally and logically require the trading profits to be recognized at the time of sale, which serves to explicate the semantic content of the "sales basis" for revenue recognition.

The net income concept under current business accounting thus can be seen to be interpretable as "a difference between ownership values" between goods delivered and received (the latter usually being a monetary asset). In contrast, the dominant accounting theory seems to be still defining income as a "difference between sacrifice value and benefit value, which, however, is not so persuasive for this author. To show

this, suppose one gets \$100 cash or account receivable from making a sale. If this firm is expected to sustain a relatively high profitability the \$100 money received surely will have a "benefit value" (i.e., the present value of future net cash inflows by the most favorable investment of the money) in excess of that quantity (\$100) of the monetary units. But such a number of the received monetary units per se are now being recorded as the sales revenue in current practice. Hence, our conclusion is that current accounting measurement is not reflecting "benefit value" in actuality.

3. Losses from "the lower-of-cost-or-market" valuation as a decrease in ownership value

Imagine an item of inventory asset with its acquisition cost of \$100, whose expected recoverable amount (as approximated by its net realizable value) at this year-end, however, has fallen to \$80. Now, if the good were deprived at this point in time, we argue that it would be only \$80 in the historical cost (\$100) that would have been lost by such assumed disappearance of the good. That is, the remaining invested money \$20 had already been denied any prospect of recovery because of the price (and value) decline, prior to the assumed deprival. It suggests that that \$20 cannot properly be called "deprival loss". We may therefore generally state that if the historical cost is in excess of the net realizable value, ownership value of the good is measured at the latter, lower amount (\$80 in our example).

Furthermore, we will bring the year-end replacement cost of the above good into consideration. In case this should be greater (say, \$90) than the net realizable value \$80, its replacing at the deprival time is not worthwhile (i.e., revenue 80<cost 90), so no replenishment will be made. But if the replacement price is smaller (e.g., \$70) than its net realizable value \$80, our rational manager will replace it. In this situation, the assumed deprival would make the invested recoverable capital \$80 lost, but a possibility of its recovery would now be provided by the reacquisition of a similar good at the lower replacement cost \$70. In summing up this analysis, the ownership value of the inventory good (i.e., of the future cash inflow \$80) can be considered equal to its year-end replacement cost \$70 in the sense that its deprival would lead to the \$70 replacement outlay of cash.

Table 1 is our result of full extension of this kind of analysis. For detailed explanation, cases (1) and (4) give the possibility of full recovery of the acquisition cost. Hence, ownership value as the lost invested money upon hypothetical deprival is clearly equal to the historical acquisition cost (HC).

Consider next cases (2) and (6). This is a situation of the recoverable amount (NRV) being smaller than the historical cost (HC), with no prospect of replacement after the deprival. The above analysis in the top paragraph of this section has shown

Table 1. Historical cost (HC), net realizable value (NRV), replacement cost (RC) and ownership value of an inventory good*

(1)	(2)	(3)	(4)	(5)	(6)
RC	RC	NRV	NRV	HC	HC
NRV	HC	HC	RC	NRV	RC
HC	NRV	RC	HC	RC	NRV

Ownership value at year-end is indicated by the underlined value in each column.
*The values in each column are shown in decreasing order of amounts.

the net realizable value to be the ownership value in both cases.

And last of all, in cases (3) and (5), the recoverable invested amounts consist of all (in case (3)) or part (in (5)) of the respective historical costs. If deprived of the recoverable capital, our manager would be justified in replacing another good by $RC expenditure, thereby restoring an opportunity of recovering the invested money (HC) from future operations. In consequence, ownership values in both cases are equal to their year-end replacement prices as additional losses occasioned by hypothetical deprival.

As for fixed assets like buildings, machines and land, immediate replacement after the assumed deprival would be almost impossible. So much time is required for the selection of the supplier, contracting, constructing as well as for delivery. Another element is loss from stopped business activities between the deprival and the completed replacement which would naturally have to be included in "deprival loss" (i.e., in "ownership value"). But estimation of such a loss would be subjected to a high degree of uncertainty. In addition, the amount of future recoverable capital by the good would also be difficult to measure correctly in case of fixed assets. So, our conclusion is that no downward revaluations of costs of fixed assets are justified unless a major and probably persistent fall in their replacement costs and/or recoverable capital invested in the goods has occurred. And this conclusion seems to fairly well correspond to fixed asset valuation in practice.

4. Normality of costs and ownership value

The Japanese "Cost Accounting Standards" state, "Costs should be normal. They are measured value consumptions which would have resulted from normal business operations, to the exclusion of any value declines from abnormal business situations."

If we apply our "ownership value" concept and define cost as the ownership value of a good or service at the time of its acquisition, we can show that costs in this sense must logically possess a sort of normality.

To see this, note **Table 2.** Actual expenditure for the acquisition (AE), average (normal) acquisition price in the market at this time-point (MP), and a maximum

Table 2. Acquisition expenditure (AE), mean acquisition price (MP), maximum expected net inflow (NRV) and normality of cost*

(1)	(2)	(3)	(4)	(5)	(6)
AE	AE	MP	NRV	MP	NRV
MP	NRV	AE	AE	NRV	MP
NRV	MP	NRV	MP	AE	AE

The underlined item is the "normal cost" as the ownership value at date of acquisition.
*The amounts in each column are shown in decreasing order of size.

expected net money inflow from the good's future utilization (NRV) are the elements we consider. Table 2 is a combination and comparison of them.

We have defined ownership value as invested money which will be recoverable from the future expected cash inflow from the good's use (or sale). Hence, in cases (1) and (3) of Table 2, not all of the actual expenditure (AE) but only the portion of expected inflow (NRV) would be the money lost by the assumed deprival, which therefore is our ownership value at the acquisition date. Replacement prices (MP) are here irrelevant because reacquisition outlay of cash (which would be approximated by MP) is in excess of the thereby recovered future income (NRV), which means the replacement is not justified.

Next move to (2) and (4), Future incomes (NRV) exceed mean (re-)acquisition prices (MP) in these cases. So, it would lead to reacquisition of the deprived good at the expense of MP. Hence, a part equalling MP of the whole outlay cost (AE) is the loss additionally occasioned by the deprival, that is, the acquisition cost as "ownership value."

The last problems are cases (5) and (6). In (5), no replacements would be made after the assumed deprival because the expected inflow is below the required expenditure. Hence, we would have a loss of NRV in this case. That is, the otherwise obtainable net profit (NRV-AE) and the actual investment (AE) would both be gone. Therefore, as for the actual expenditure (AE), its total amount would be lost by deprival, which is "ownership value." On the other hand, in case (6), the maximum expected income (NRV) is larger than mean acquisition price (MP), so a deprival would result in a reacquisition. And this replacement price (MP) is expected to be recovered by the future income (NRV) probably along with a normal profit (NRV-MP). In sum, the amount of deprival loss is equal to the original (not replacement) cost (AE).

We can summarize and state that if the actual expenditure (AE) is in excess of the market value (MP or NRV) significantly a normal cost is obtained by reducing the actual outlay to the lower of the market prices. This seems to correspond to our sense of normality. And further, in case the acquisition expenditure should turn out to be lower than the markets, the actual outlay (AE) is our basis for normal cost

valuation of assets.

This latter prescription may well sound strange in that the market values are not consistently used as the criterion for normality. But referring to fixed asset valuation in practice,

"[i]t is possible for assets to be acquired at a bargain price, perhaps in a distress sale. In this event authorities differ as to whether actual cost should be written up to market value. Since accounting practices tend towards conservatism in this situation, in conformity with the concept of valuation at the lower-of-cost-or-market price."[3]

Accordingly, the general tendency of accounting practice seems to concur with our conclusion of the lower acquisition price being recquired as the valuation basis instead of the higher market value (MP or NRV). The apparent inconsistency of our valuation basis has been shown to be logically explicable as the "ownership value" measurement, even though, of course, the normative theory of "present value measurement" will certainly insist upon consistent use of the market value. Our purpose, however, has been a descriptive analysis of the current accounting practice, not extension of any normative accounting theory.

Lastly, the acquisition cost of a donated asset will be considered in the context of normal cost problem. Conventional accounting practice is arguing that such a good is to be measured at the "fair value."[4] To understand and operationalize this, note that acquisition of an asset with no given considerations is almost tantamount to obtaining cash in the amount of the normal (average) acquisition price of the good, under the condition that the money should strictly be expended for its purchase. And we can assume as if an immediate outlay of the cash has resulted in acquisition of the good. Considering now possible relationships between the invested money sum (MP) and the expected cash inflow from the resource (NRV), two cases

(a) $MP \leqq NRV$,

and (b) $NRV < MP$

are possible. In case (a), an assumed deprival of the good would lead to its replacement, and hence deprival loss would be MP, the expected invested money for replenishment, which is the "ownership value" for this case. The other case (b) would not make the deprived firm replace the lost good. Hence, the deprival loss is equal to NRV, which is the amount of ownership value in this situation.

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3) S. Davidson (ed.), Handbook of Modern Accounting, McGraw-Hill 1970, pp. 17–18.

4) According to the Japanese Corporate Accounting Principles, "as for donated, or otherwise costlessly acquired assets, their fair values should be regarded as their costs." (Principle 3–5–F). For the American accounting rule, see the following provision: Accounting Principles Board, Statement No. 4; Basic Concepts and Accounting Principles Underlying Financial Statements of Business Enterprises, October 1970, 182.2.b.

In sum, the ownersip value of a donated asset is the lower of its mean acquisition price and its expected future cash inflow. The characteristic of "normality" can properly be admitted to such market valuation us a reflection of the consensus of the market participants. In consequence, normal "fair value" measurement in this kind is seen to have the semantic content of ownership value information.

5. Conclusion

We have demonstrated that three aspects of conventional financial accounting measurement, viz., (1) sales basis, (2) the lower-of-cost-or-market rule, and (3) normal cost valuation all cooperate to produce a consistent measurement of "ownership value" and its changes. Future studies are needed to investigate applicability of this value concept to explanations of the other phenomena in current financial accounting practice.

A PRODUCTION SYSTEM FOR TRANSPORT SERVICES

Tetsuji SHIMOJO

I Preface

The transport industry specializes itself in producing and selling transport services. As often stated, a commodity like service always produces and consumes at the same time and at the same place, so that service can be sold only while being produced according to the specification contracted between producer and consumer prior to production.[1] Almost all services including the transport services, therefore, have to be sold under an advance contract, and the production and sale of services are indivisible.

Moreover, the transport services are a kind of so-called instantaneous goods, and they have similar characteristics as other services in general. In addition to that, the transport services have several peculiarities with regard to their supply, as they have a peculiar production system. In this paper, we are going to observe a system prepared for the production of transport services, and investigate its peculiarities compared with general visible goods and other kinds of services.

Although general services have been discussed in many papers, no comprehensive and authorised investigation has been made. There is a variety of definitions for services according to the industries designed as service industries.[2] According to Ihara who dealt with a service in the common meaning the peculiarities of services are as follows:[3]

(a) impossibility of storage and carriage,

(b) dependence of production on demand, and

(c) incapability of planned production.

Planned production in (c) means not a production according to a specification given in advance by consumers, but a production for the sake of a future demand, so that all three peculiarities have instantaneousness of services in common.

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1) It is not rare that the specification of services is given not by the consumer but by the supplyer. In such a case the consumer will buy a service after he agreed to the specification given by the supplyer. And further, the production will be commenced after the supplyer has recieved the consumer's instruction to do so.

2) Victor R. Fuchs; *The Service Economy*, National Bureau Economic Research, 1968, translated by K. Emi, Nippon Keizai Shimbunsha, 1974.

3) Tetsuo Ihara; *Service Keizaigaku Nyumon*, Toyo Keizai Shimposha, 1979, pp. 31–41.

Ihara further listed the following peculiar phenomena in the service industry:[4]

(A) overdemand and oversupply
(B) high increase rates of price
(C) district gathering of supplyers
(D) labour intensive
(E) small business

This list proves that he was dealing only with an industry supplying services in the popular meaning, and that he never aimed at an independent industry producing and selling a kind of goods named service in the original and genuine meaning.

What we are going to consider in this paper is this kind of goods where economical goods are classified into three kinds: visible goods, action goods, and intelligence goods. They correspond to the three physical concepts: materials, energy and information respectively, but it might be better to state that service corresponds to action or work-done by the energy.[5]

II Production of Services

In accordance with Hicks' definition of production being an action to fulfill other people's desires through exchange,[6] we can classify production into the following three concepts:

(1) Extraction: the action of extracting resources from nature and transmute them into economic goods to satisfy human desires,

(2) Processing: the action of transforming economic goods into goods of higher value by changing their physical or chemical character, and

(3) Removing: the action of transposing economic goods into goods of higher value by changing their spacial, temporal or social position.

These actions can be further classified into more detailed actions according to respective objects. The objects of human actions may include, not only materials as visible goods, but also information as intellectual goods and sometimes human beings themselves. The reason why services are not included here is that, as said before, they cannot be the object of these actions. But it must be borne in mind that all actions of extraction, processing or removing are nothing other than services themselves.

This can be easily understood when we compare those three kinds of actions with their respective objects. The action of extracting coal from a coal mine and to supply it as a commodity can be deemed akin to the action of collecting fruits and

4) *Ibid.*, pp. 3–13.
5) Tetsuji Shimojo; *Economic Analyses of Shipping Freights*, Kobe University, 1979, pp. 23–29.
6) J.R. Hicks; *The Social Framework—An Introduction to Economics*, Oxford, 1942, Chapter 2.

animals by using natural growing powers in agriculture, forestry or livestock industries. Further, a similar kind of productive action exists in the natural and social sciences that observe and analyze natural and social phenomena and extract natural and social rules. They extract information from the natural and social environment.

The other kinds of actions to process and remove materials or information extracted from the environment in order to improve human satisfaction can be called productive actions. Educational, medical or passenger services are production rendered to the human beings.

Here, what we would like to stress is that all of these actions are fundamentally human activities. Extraction, processing and removing are, at least primitively, work done by human beings. Though most of these actions are accomplished with hand tools or by machines with mechanical motive power, they are human actions.

If we admit this, we can say that all production activities are services. In most production activities, however, services themselves are not treated as objects of exchange, and only visible or intellectual goods which are extracted, processed and removed by the actions of services can be exchanged as commodities. The reason is that services cannot be separated from the objects of their own actions.

We agree that a kind of goods named services can be exchanged between producer and consumer, but we cannot separate them from the objects for two peculiar characteristics: instantaneousness and connectiveliness. Services are instantly consumed by their objects while they are produced. Of further importance is that during the time and the place they are produced, the object must be directly connected with the service producing facilities.

All production activities are the actions of services. However, the general classification of industries focuses on the point that the objects of services are being exchanged. The iron and steel industries exchange their products, which were processed thanks to the services from iron ore and coal. In the production process not only iron ore and coal but also labour and capital are input. Iron ore and coal compose a physical part of the product, but labour and capital do not compose any physical part of the final product. They compose an important part of the cost. Thus, in most other industries as well, services will not be an object of exchange.

As far as an industry can input its materials and output its products through exchange, it does not need to separate the services of labour and capital from its final products, it has only to evaluate their portion in the final value of the products.

There is another kind of industries, however, where, for various reasons, the objects of services cannot be input as materials into their own production process. It is easy to see a case where services serve human beings. Even in the case where services are rendered on visible goods, there are many industries where the objects

of services are input not as materials but as consigned goods for economical reasons or for convenience sake. A typical example is the transport industry which specializes itself in rendering services on cargo entrusted by customers.[7]

Hence we can define the service industry in its widest sense as: "An industry that does not input any materials in its own production process but renders services of labour and capital on the objects entrusted by customers." And production of services means to render services to some objects by means of labour and capital. The objects of transaction in this industry, therefore, may be the quantity and value of services rendered by capital and labour.

III Cooperation of Labour and Capital

It is difficult to measure directly quantity and value of services. But it is possible to evaluate the total costs of services rendered by labour and capital to some objects. However it is not always possible to assess the average cost per unit unless the quantity of the objects can be determined. In reality, the quantity of the objects is measured and the average costs are evaluated very roughly or in some convenient manner.

These facts are based on the inherited characteristics of services. Services economically speaking are actions or work effectively added to some objects. An action or work can be rendered only when an object is connected to a power. Even if there is a power capable to render an action or work, the power can not be significant without any object.

Power has various physical forms: heat energy, magnetic energy, motion energy, and so on. These forms of energy can be converted, so that power will be applied effectively in the most convenient form. There must, therefore, be an equipment prepared to convert power into the most convenient form. The most primitive type of heat-converter is human beings. A human being creates energy by means of metabolism, and converts it into motion energy of the arms and legs to apply various actions to surrounding objects. This action is called labour.

The human being invented various kinds of tools in order to save and to amplify his own labour power, and utilized various kinds of power in his environment, e.g. animal power like the bull and horse, or natural power like wind and water stream. This primitive power, however, was much more difficult to control compared with his own labour power, and was not always available at any time and at any place needed. The invention of steam engines solved such difficulties for the first time, and

7) In its development process the transport industry transformed itself from Private Carrier to Common Carrier. This means that the industry changed into an industry specialized in producing only services. See Sempei Sawa; *Kaiun Riron Taikei*, Yuuhikaku, 1949, and Sempei Sawa; *Kotsu Gairon* (revised edition), Yuuhikaku, 1954.

in a short period, new techniques to utilize mechanical power were diffused in the world. Thus, tools that were handled by human labour have evolved to the machines with their own power generators, and a remarkable change in the cooperative relationship between human labour and machines as capital appeared.

Capital, in general, is input into the production process to render a service to an object on behalf of the human being. In order to make capital work for a certain objective, however, it always needs more or less support from human labour. There are still many types of machines that need human labour as an energy source, and even the machines with their own built-in power generators almost always require human labour for their maneuvouring control. Further more, we can not imagine the substitution for the human labour in devising those machines and in designing these working processes.

Human labour is now working production activities in cooperation with machines or capital. Thus, we find the following human contribution in the production system of cooperation between capital and labour:[8]

(1) as power source in the production system

(2) as controller of the production system

(3) as designer of the production system.

This contribution can be called muscle labour, nerve labour, and brain labour respectively likening to each function in the production system.

When capital renders its inherent service, it needs cooperation of human labour. Machines with built-in power generators which do not owe to human labour for the power need fuel instead of human power. In the cases where natural power like wind and water stream are utilized, no expense of fuel is needed but highly skilled labour will be needed to control those powers.

At the present stage, the maneuvouring control of machines owes greatly to human labour, and yet, an increasing number of apparatus assist human labour, and we must not forget that knowledge and techniques are indispensable not only to control those machines but also to design them. Thus, we can say that the production system is a complex of services rendered by human labour and capital, and that the respective contribution varies corresponding to the stages of development.

As Marshall says, human being inherently creates nothing but ideas.[9] Neglecting the object of services in the production process, all production activities consist of only rendering of services. Human labour has been rendering these three sphares of contribution to the production processes in an indistinguishable manner, but gradually a distinction among them became apparent as capital became more and more manifold and production processes became more and more complex. A number

8) Shimojo *op. cit.*, p. 29.

9) A. Marshall; *Industry and Trade*, 1919, III-3(1).

of firms specializing merely in a few sphares of services can be found. The lease industry is an example, it specializes in rendering capital goods to other firms.

IV Characteristics of Transport Services

If we define the transport industry as an industry specialized in producing and selling transport services, then the transport industry is one of the service industries according to our classification. The transport industry produces and sells services to remove visible goods or cargo entrusted by customers or to carry human beings or passengers.[10] It is a very important fact that the cargo or passengers receiving transport services are input into the production process of the industry not through exchange in the market.

There are various industries whose production process involves a removal of visible goods or human beings, and transport services are produced. Nevertheless, unless an industry is specializing transport services, we can not call it transport industry. The visible goods or human beings receiving such transport services are materials, fuel or employees input into their own production processes.

The transport services are understood to overcome spacial distance or spacial removal of objects. Capital and labour to produce the services must exist at the same time and at the same place as the objects receiving the services. Production of services always needs a certain length of time, during which this condition must be satisfied. Therefore, capital and labour for the production must be removed along with the objects or must exist as to cover the whole process of spacial removal, from origin to destination. This is one of the peculiarities of the transport services and of the production system, as compared with other services.

In order to remove certain objects, they must be separated from other objects before all. In other words, the objects to be removed must be distinguished from objects not to be removed. For this purpose, we preferably use a container with the objects to be removed instead of carrying them directly.

The carriage of cargo or passengers in a container prepared for this purpose consists of two functions: to heave the container vertically and to remove it horizontally.[11] To heave it vertically is to separate the container from the space in

10) Communication can be included in the concept of the transport industry, then it is deemed as a spacial removal of information. We are concerned with the spacial removal of cargo and human being, but our discussion can be applied to the service industry in a wider meaning.

11) In dynamics, a quantitative expression of work-done W is $dW=Fdr$ denoting a force by F and a distance by r. If F can be expressed as $F=ma$ and a considered as inertia in vertical direction, then F will be a weight of cargo and container. Thus we can see that a work-done of removal is a compound of two components, weight and distance.

which the carriage is done, in order to lessen friction and to minimize motive power needed during the horizontal removal. Rollers or wheels are tools devised for these purposes, and pavement of roads or construction of railroads make them more effective. On the water surface, water-tight containers are utilized in order to realize a natural power of buoyancy, and number of devices are added to lessen water resistance.

Horizontal removal needs a certain quantity of motive power. Primitively human labour was used for this purpose, and later animal or natural power like the wind or water stream. It is less than two handred years that steam engines became popular. As stated before much devices were made to lessen friction and resistance during the removal in order to obtain better movement with smaller motive power.

For the transaction of transport services, the supplyer must remove objects from one point to another. This implies another type of service to control the direction from the place origine to the destination. Not only to control the direction and speed but also to select a route is a very important function for this type of service, because the route relates not only to distance but to effectiveness of motive power and safety during the removal.

Thus transport service is understood as a compound of three kinds of services: to heave objects, to remove them, and to control the direction and select a route. All these services were primitively done by human labour, but in every historical stage of development a great number of tools, machines and knowledge were introduced to save human labour.

As transport service is a kind of services, it has the characteristics of services in general. Physically they have the characteristics of instantaneousness and connectiveliness, which means that power rendering action and objects being rendered action must always exist at the same place at the same time. This further means that the action takes a certain length of time. As every action takes a certain length of time, the power and the object must be at the same place during the time. The same applies where the object is being removed.

An additional characteristics of the transport services is that the power rendering action must remove itself along with the object being removed. A service which gives the object only inertia and no aftercare is not a transport service.[12] This fact leads to the unique necessity for the transport service to return capital and labour in the production process to the original point once the production is over by the removal along with the objects.

We have mentioned before that the production of services is significant only

12) In case of carriage of lumber on a river, it is necessary to collect the lumber at the destination and to put it on the stream avoiding obstacles.

when the objects exist at the same place as capital and labour in use. In the production of transport services, however, if there is no object to remove, production can not be rendered while capital and labour are removing themselves to the next point for the next objects. Can removal of capital and labour themselves be called production? That may be a point of dispute, while it is true that such a service can not be sold in any way.[13]

V Components of the Transport System

Production of transport services is done through the cooperation of capital and labour prepared for this purpose. Let us call this cooperative system of capital and labour simply the transport system. The transport system, as we have discussed heretofore, has several unique peculiarities in addition to some characteristics common to the production system of other types of services.

The transport system, as we understand it, is slightly different from the transport facilities in texts of transport economics. Transport facilities correspond to a set of physical equipments prepared to remove objects,[14] while for us they are a cooperative system of those equipments and human labour. The transport system can be said to be, therefore, a perfect system for the production of transport services.

When we say that the transport system is a cooperative system of capital and labour, capital is defined as a set of equipments invested by the transport firm for its own production activities. This means that the sea for sea transportation, the air for air transportation or the roads for road transportation are not a component of the transport system. These natural and man-made things constitute no investment by the transport firms and are only external environment for transport systems, and their most effective utilization is the only problem for the transport systems.

Transport facilities as a set of physical equipments are said to consist of three components: (a) way, (b) vehicle and (c) motive power.[15] In contrast, the transport system consists of slightly different components. This is due to a difference in definition, and a difference of objectives basing on such a definition.

Transport system, as we understand it, consists of three components corresponding respectively to three kinds of services. As discussed before, transport service contains actions to heave and separate objects from others, to obtain mainly a horizontal movement, and to control direction and speed and to select a route. The

13) This is similar to fixed cost in general production. Capital and labour are input into the production process to supply services but have no exact realation to the quantity of objects receiving services.

14) See Sawa, *Kotsu Gairon*, *op. cit.*, p. 19.

15) *Ibid.*, pp. 20~.

components of the transport system corresponting to these three kinds of services are:

(a) Vehicle,

(b) Motive Power, and

(c) Control.

Though the first two are identical to those in transport facilities, there are some differences as for thier implication, which we shall discuss hereafter.

(a) Vehicle: The first step to transport cargo or passengers is to heave and separate them from other things. A single unit of cargo can be removed directly as it is, but in general it is more convenient to carry it in one lot in a container. Thus, the container is only an object of transport, and furthermore it can easily be transformed into the most convenient shape. Hence, to serve as a container is the first implication of the vehicle.

To remove the container itself, it is necessary to lessen friction and resistance between the container and the earth or water surface. Wheels are sufficient for comparatively smooth surfaces like pavement, but not for rough surfaces like wasteland, for which railroads or caterpillers were invented. On or in the water, containers are shaped such as to minimize resistance from the water. For more effective removal of containers the earth surface itself is often transformed. Railroads, pavements or canals for private use are a few examples for a vehicle as we define it.[16]

Vehicles include another kind of equipment to load cargo or passengers into the container. Cargo handling equipments in railroad stations or ports are, so far as they are prepared for the firms' private use, a part of the vehicles. More often, they are not included in the vehicle in our detinition as they are investments by other firms for their respective objectives.[17]

(b) Motive Power: Force is necessary to remove something. Steam engines transform heat energy obtained by burning coal in a boiler into steam energy, and then into motion energy by pistons and cylinders, and finally into propelling power by screws or wheels. It is easily understood that such power is the same as human or animal power of the past, and as the power obtained by electric motors or gasoline engines.

Human and animal power are obtained by metabolism of food which cannot be called fuel, while mechanical power needs some form of fuel as an energy source, and some equipment to transform it into propelling power. There are many kinds of equipment to obtain propelling power through transformation, e.g. from heat energy by burning of coal or oil, from explosion power of gasoline or heavy oil, from electric

16) Here we understand vehicle as private capital invested by a certain transport firm so that only private roads and canals are our objects. Social capital is not included in our transport system.

17) These firms may be a sort of transport firms. Shimojo *op. cit.*, deals with them as supplementary transport services.

power, and so forth. Fuel and such equipments are now the second component of our transport system.

(c) Control: Removal of things suppose always an origine and a destination, and a route between them. The transport services constitute removal of objects from a point of origine to a point of destination. The route is usually determined by the carrier unless it badly affects the object, so that the transport services select the most economical and the most efficient route for the carriage. Hence, the control of direction, speed and route are the most important and the most self-controlable components of the transport system.

This kind of services is so far rendered in most cases by human labour. Or we can say that service is the least modernized sector in our transport system. More and more tools and machines, however, assist human labour of this kind. Meters to measure distance, speed, height, depth, etc. and various kinds of communication equipment are now in use. In addition to such hardwares we must not forget a great number of softwares to make services more effective.

Again, the transport system is a cooperative system of capital and labour, and the cooperation exists in each of the three subsystems. Sometimes it may be difficult to divide clearly one from the other as there are very close and organic relations between them. Any way, it is certain that every transport system consists of these three subsystems.[18]

We find some examples of the close and organic relations between these subsystems. Because railways have adopted railroads as their subsystem of vehicles, control of direction as an important part of its control subsystem can be done by only trifle labour to change points.[19] In general, a transport system giving regular services on a fixed route enables firms to avoid a bigger part of service of selecting routes.

If we define the transport system as consisting of capital privately invested by a transport firm and labour of people employed by the firm, then a service the firm receives from external sectors is the purchased product of other firms. Beginning from pavements, highways, etc. to various road-marks or signals, and other traffic control systems, or up to NNSS, many kinds of services are supplyed by public and private institutions. Various forms of charges and fees are payed for these services, so that there is a sort of exchange of services.[20]

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18) An indirect administration sector is necessary for production, but we neglected it in our discussion.

19) For this reason Shimojo *op. cit.*, insists that the way as one of the transport facilities is functioning by human labour. In this sense, rails and cables can be said to be components of the control system.

20) From this point of view, the railway invested almost all systems by themselves while road transport depends entirely on external services.

Furthermore, it must be recollected that transport systems are setting lots of services from nature. The sea for sea transport and the air for air transport, but also the wind and water stream for water transport are all a gift of nature. People may enjoy the gift as a reward for their efforts and expenses to utilize them efficiently, but we would like to warn that pollution of the air and the sea water through their activities must be reasonably indemnified.

VI Postscript

We have dicussed heretofore implications and production systems of services in general, and then listed peculiar characteristics for the production of transport services, in order to establish a theory for a cooperative system of capital and labour and a production system for transport services. This problem has been dealt with as a trifle matter of common sense and seldom discussed in any academic paper. The words service and transport service themselves, therefore, have been used without any precise definition nor description.

Transport services, similar to services in general, have the peculiarity that there is no exact relation between the capacity of production system and the quantity of products. Thus it is very difficult to find a production function for services. Though we tried to establish a sort of production function in our discussion, it is rather difficult to define the quantity of products. In the production of services wholy dependent on demand, idleness of capacity is the most common and inevitable phenomenon.

In addition to the high variety of demand, the fact that an expansion of capacity can not always conclude an increase of the products discouraged investment in the production facilities for services. This may be the reason why the service industry is often characterized as labour intensive. It is appropriate that Fuchs classified Transport and Communication in the Mining and Factory Industry, for both require huge capital facilities and high complex technology.[21]

As we have observed, however, the transport system itself has originated from a system of only labour. Since the transport industry specializes itself in the production of transport services, it has always tried to improve the contribution ratios of capital and labour. For the peculiarities of the transport services, mechanization of its production system is less easy than the inevitable need for modernization. Even if the transport industry has many peculiarities different from the service industry in general, it has nevertheless a number of common merits and demerits as for production and sale of the products. Our discussion, we trust, could supply an inertia to the general theory of service. (82/11/30)

21) Fuchs, *op. cit.*, pp. 39–42.

SOME EVIDENCES BETWEEN FOREIGN DIRECT INVESTMENTS AND FOREIGN EXCHANGE RATES: A PRELIMINARY NOTE

Kazuhiro IGAWA

1. Introduction

It is not sure whether effects of a foreign exchange rate on foreign direct investments are strong or weak. A generally accepted idea is;

(i) In the long-run, the effects are weak, and

(ii) In the short-run, they are not weak.

we can find many articles in news papers saying that a foreign direct investment is strongly affected by movements of foreign exchange rates. The views in news papers are mainly or usually concerned with current (or short-run) problems. However, a foreign exchange rate is neglected or paid only few attentions as a determinant of long-term capital movements, in a textbook of international economics. The stress is on the "long-term", in this case. It might be interesting to find factors distinguishing the concepts of the short-run and the long-run. However, it is much more meaningful to see the real facts. This paper is devoted to get some empirical facts of real world, especially the relations of foreign direct investments between United states and major European countries.

It is reasonable to pick up advanced major countries as sample countries of finding a role of a foreign exchange rate in determining foreign direct investments. This is because, a foreign direct investment to developing countries is probably determined through many reasons other than a foreign exchange rate. United states is chosen because of data availability. We take a time period of a flexible exchange rate system of 1970s, in our empirical research. Although a direct investment is not an useful concept in discussing a real capital movement, this is a main problem in this paper, we use the data of foreign direct investments as a substitute of international real capital movements. This is because, on the one hand, no available data exist for international real capital movements. On the other hand, real capital movements are captured as an increase of real investments in one country accompanied with a decrease of them in other countries and foreign direct investments include some of these phenonena.

In section 2, we summarize other empirical papers related to our topic and we show our own results in sections 3 and 4.

2. Some related works

In his paper [1980], Agarwal gives us a survey of current literatures on determinants of foreign direct investments. The relation between a direct foreign investment and a foreign exchange rate is summarized as "Currency Area Hypothesis". He says that the majority of economists have come to the conclusion;
"devaluation encourages inflows of foreign direct investments and discourages outflows of foreign direct investments."
This is exactly the proposition which we want to test, in section 3.

There exist many determinants of foreign direct investments and a foreign exchange rate is one of them. The one who take currency area hypothesis does not argue that a foreign exchange rate is a main factor influencing foreign direct investment decisions but wants to show that the foreign exchange rate has some influence on them.

Before going to our empirical study, let us summarize three papers, which are closely related to our analysis in this paper.

Using a neoclassical investment function, Goldsbrough [1979] explains how a multinational firm locates its production facilities among different countries. Using the relation that a desired capital stock K^* is positively related to a output level, Q, he mostly pays attention to the determination of Q. From a profit maximization condition, Q is determined to equalize marginal revenue and marginal cost. When a foreign exchange rate changes, both a marginal revenue and a marginal cost move and an equilibrium output level must be adjusted and thus K^* is adjusted. K^* has some relation to direct foreign investment.

Now, problem is how a marginal revenue and a marginal cost are affected and this depends on whether outputs and inputs are traded or nontraded goods. He argued that the subsidiary's final outputs are more likely to be a traded good than are its inputs, particularly its labor inputs. In this case, a devaluation of the foreign currency would tend to increase the outputs of the foreign subsidiary and thus increase a direct foreign investment. This is a simple application of the theory of currency devaluation with domestic or non-tradable goods (or inputs). Empirical resutls show significant relations between relative labor costs and foreign direct investment flows (see **Table 1 by Goldsbrough**). Furthermore, the relative unit labor costs reflect changes in foreign exchange rates (see **Chart 1 by Goldsbrough**). Therefore, the relations between a foreign exchange rate and direct foreign investments are determined.

Kohlhagen's study [1977] showed that the currency devaluations of the United Kingdom, France and Germany during 1960s increase the relative profitability of domestic production and decrease the one of foreign production and thus induce

Table 1. Four countries: Cumulative effects on foreign direct investment (FDI) flows of a 1 per cent increase in host country's real level of demand ($\bar{Q}$) or in relative unit labor costs (C_{AV})[1]
(In per cent)

Country and FDI Flow	1 Per cent Increase in Real Demand	1 Per cent Increase in Relative Labor Costs
United States		
Inflow	0.39	−0.84
Outflow	1.53	−1.49
Federal Republic of Germany		
Inflow	0.76	0.29
Outflow	0.59	−0.45
United Kingdom		
Inflow	1.60	−2.48
Outflow	0.51	−0.26
Japan		
Outflow	1.83	−1.86

[1] The figures in the table give the percentage changes in the total flow of FDI over a four-year period following a permanent 1 per cent increase in real demand or in relative labor costs (i.e., for the United Kingdom, a 1 per cent increase in demand causes total FDI inflows over the next four years to rise by 1.6 per cent).

The estimates are calculated on the assumption that the rate of interest, r, is a constant 10 percent. A lower rate of interest would lead to larger elasticity estimates.

the inflow of foreign direct investments. He correctly pointed that, under a floating regime, if exchange rates in the long run approach to the purchasing power parity, then the "average" industry should receive no incentives for direct foreign investments from exchange rate changes, but the timing of direct foreign investments will certainly be affected by anticipated changes of foreign exchange rates. Using the expected parity change dummy of ... $-e^3$, $-e^2$, $-e$, 1, e, e^2, e^3 ... for an anticipated devaluation abroad; of ... e^3, e^2, e, -1, $-e$, $-e^2$, $-e^3$ ... for an anticipated revaluation (where $0<e<1$), he got the empirical results (see **Table 2 by Kohlhagen**). This shows that the regression coefficients except for the second German revaluation are the expected sign and the coefficients are significant.

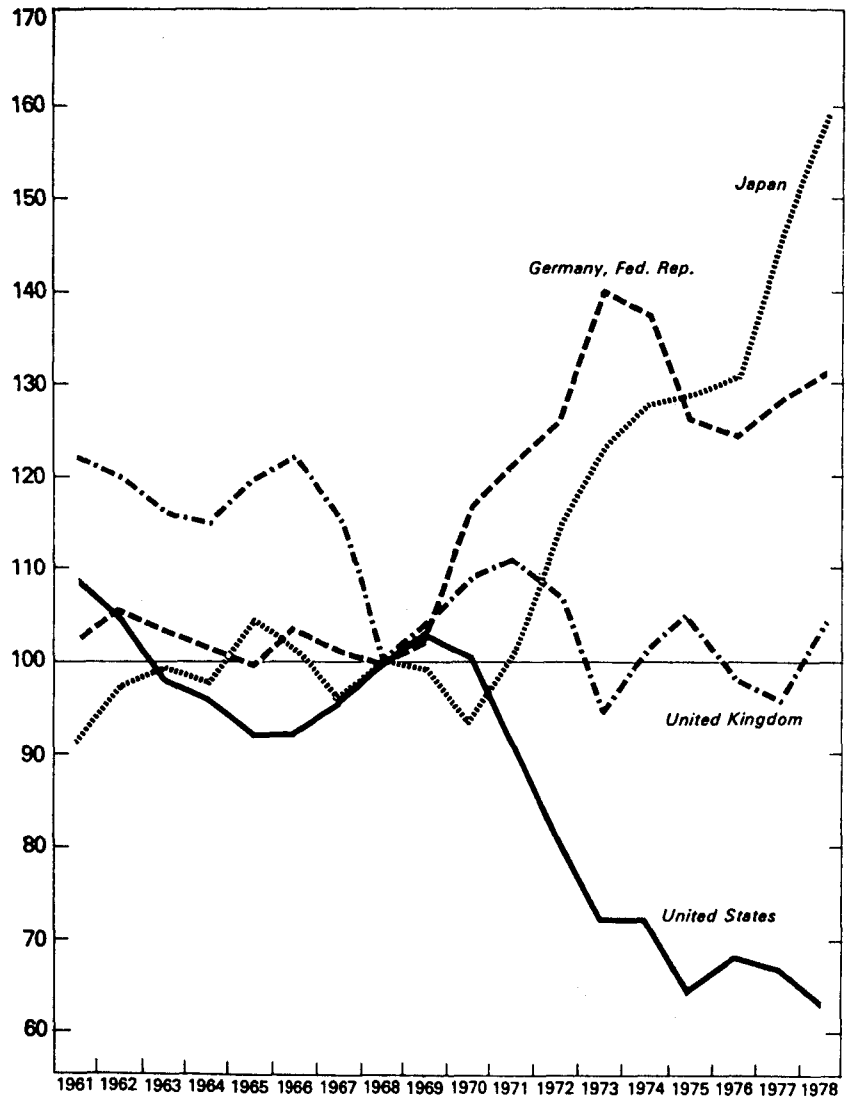
Lupo [1978] investigate the relations between capital expenditures by majority-owned foreign affiliates of U.S. companies and exchange rates. The regression equation is of the following form:

$$lnCEM_t = lnA + a\ lnOM_{t-1} + b\ lnWP_{t-1} + c\ lnER_{t-1} + \sum^{10} h_j D_j$$

where CEM_t is the value of capital expenditures by majority-owned foreign manufacturing affiliates of U.S. companies in year t and OM_{t-1} is output in host-country in year $t-1$. WP_{t-1} is wholesale prices in host-country in year $t-1$ and ER_{t-1} is foreign exchange rate of host-country currency in year $t-1$. D_j ($j=1, \ldots, 10$) is a country dummy variable. The results are:

Chart 1. Four countries: Relative unit labor costs in manufacturing, adjusted for exchange rate changes, 1961–78

(1968=100)



Source: International Monetary Fund, *International Financial Statistics*, various issues.

Table 2. The Herring-Willett results for individual countries

Dependent Variable	Sample Period	Constant	DM	T	D1C1	Parity Change Dummy	S.E.	R^2	D.W.
UPE	1957-73	-1475.65 (-1.68)	27.83 (2.67)	22.68 (1.34)	-193.52 (2.20)	-	110.09	.916	1.91
FPE	1957-73	-1310.56 (-3.47)	15.21 (3.38)	19.12 (2.62)	-133.53 (-3.53)	-	47.46	.961	1.28
GPE	1957-73	-3589.34 (-4.05)	11.50 (1.09)	60.01 (3.51)	-351.06 (-3.96)	-	111.31	.935	.95
UPE	1957-73	-997.39 (-1.23)	32.21 (3.40)	13.93 (0.9)	-307.73 (-3.26)	UKD 106.87 (2.13)	97.55	.939	2.29
FPE	1957-73	-1068.16 (-3.63)	15.72 (4.63)	15.21 (2.71)	-94.63 (-3.07)	FD 51.29 (3.30)	35.75	.979	2.47
GPE	1957-73	-4448.78 (-5.48)	3.74 (0.40)	76.22 (4.89)	-335.19 (-4.51)	GD1 96.05 (2.58)	92.95	.958	1.85
GPE	1957-73	-2503.13 (-3.21)	18.53 (2.16)	40.45 (2.73)	-194.06 (-2.24)	GD2 -151.34 (-3.05)	87.01	.963	1.81
GPE	1957-73	-4294.96 (-3.10)	5.93 (0.44)	73.05 (2.80)	-389.23 (-3.64)	GD12 43.76 (0.67)	113.73	.937	1.13

Definitions of Variables and Data Sources

Numbers in parentheses are *t*-statistics

UPE = the total plant and equipment expenditures by all foreign manufacturing affiliates of U.S. corporations in the U.K. in millions of dollars.

FPE = the total plant and equipment expenditures by all foreign manufacturing affiliates of U.S. corporations in France in millions of dollars.

GPE = the total plant and equipment expenditures by all foreign manufacturing affiliates of U.S. corporations in Germany in millions of dollars.

UKD = the variables representing the effects of the 1967 pound devaluation on direct foreign investments in the U.K. (as described in the Appendix).

FD = the variable representing the effects of the 1969 French franc devaluation on direct foreign investments in France (as described in the Appendix).

GD1 = the variable representing the effects of the 1961 Deutschemark revaluation on direct foreign investments in Germany (as described in the Appendix).

GD2 = the variable representing the effects of the 1969 Deutschemark revaluation on direct foreign investments in Germany (as described in the Appendix).

GD12 = the variable representing the effects of the 1961 and 1969 Deutschemark revaluations on direct foreign investments in Germany (as described in the Appendix).

$a=2.2, \quad b=0.2, \quad c=-0.5$

The negative sign of the coefficient c indicates that as a host country's currency becomes more expensive relative to the dollar, affiliate's capital expenditures decline. Therefore an appreciation of a host-country currency has a small negative impact on capital expenditures.

3. U.S. Foreign Direct Investment Inflows and Outflows

As a first step for the more rigorous empirical studies, we just tested the relations as follows:

(i) U.S. currency depreciation has a negative effect on foreign direct investments

from U.S. to major countries (France, Germany, U.K. and Japan).

(ii) Depreciation of U.S. currency induces foreign direct investments from those countries to U.S.

The first equation for regression investigating the relation (i), is

(1) $DI_t=a_1+b_1ER_{t-1}+c_1DI_{t-1}$

where, DI_t is an index (base year is 1970) of foreign direct investments from U.S. to the countries (France, Germany, U.K. and Japan) in year t and ER_{t-1} is an index (base year is 1970) of a foreign exchange rate to those countries in year $(t-1)$.*)

The results are:

$a_1=-0.07$, $b_1=0.13$, $c_1=1.11$

(1.03) (29.98):(t-value)

D/C (determination coefficient): 0.97

D/W Ratio : 1.96

These results are very unsatisfactory. First, t-value of b_1 is small and, secondly, c_1 is larger than one. Even if we use ER_t instead of ER_{t-1} or use time trend instead of DI_{t-1}, we get worse results. The only reason we showed above results is the sign of b_1 which satisfies relation (i),

Following Lupo, let us use country dummies, CDF of France, CDG for Germany and $CDUK$ for U.K.. With these country dummy variables, the equation is

(2) $DI_t=a_2+b_2ER_{t-1}+c_2DI_{t-1}+f_2CDF+g_2CDG+k_2CDUK$

The results are

$a_2=-0.09$, $b_2=0.24$, $c_2=1.11$, $f_2=-0.09$, $g_2=-0.06$, $k_2=-0.11$

(1.31) (28.80) (−1.58) (−1.02) (−1.52)

D/C: 0.97, D/W: 2.24

Here we get rather improved results for the t-value of b_2 but it is not sufficient.

If we restrict the analysis on manufacturing industries, similar equation as (1) and (2) do not give us desirable results. This is contrary to our expectations that foreign direct investments in manufacturing industries are more significantly affected by foregn exchange rate movements.

Next, foreign direct investments to U.S. from four countries, which is the relation (ii) above, are examined in a similar way. Using the following equation:

(3) $USDI_t=a_3+b_3ER_t+c_3USDI_{t-1}$

we get

$a_3=1.96$, $b_3=-1.96$, $c_3=1.19$

(−2.53) (20.12)

*) Data of boreign direct investments is from Survey of Current Business, and data of foreign exchange rates is from International Financial Statistics (IMF).

D/C: 0.95, D/W: 1.39

where, $USDI_t$ is an index (base year is 1970) of foreign direct investment from four countries (France, Germany, U.K. and Japan) to U.S. in year t.
If country dummy is introduced

(4) $USDI_t=a_4+b_4ER_t+c_4USDI_{t-1}+f_4CDF+g_4CDG+k_4CDUK$

$a_4=3.23$, $b_4=-2.87$, $c_4=1.17$, $f_4=-0.68$, $g_4=0.92$, $k_4=-0.13$
(−2.32) (19.05) (−1.82) (−2.43) (−0.25)
C/D: 0.96, D/W: 1.80

These are good results for supporting the relation (ii). In the above equations (3) and (4), we have used the current exchange rate index instead of the one of the previous year, which is used in equations in (1) and (2). Using ER_{t-1} in equations (3) and (4) does not change the results seriously, but give us small t-value for b (−1.26), in the case with country dummy variables.

In the above equations (3) and (4), both c_3 and c_4 are larger than one and thus it seems better not to use distributed lags. Therefore, let us put a time trend instead of $USDI_{t-1}$ in those equations, which is now equations (5) and (6), respectively. The results are follows, where T is time trend.

(5) $USDI_t=a_5+b_5ER_t+c_5T$

$a_5=5.35$, $b_5=-6.87$, $c_5=0.81$
(−3.88) (5.99)
D/C: 0.66, D/W: 0.38

(6) $USDI_t=a_6+b_6ER_t+c_6T+f_6CDF+g_6CDG+k_6CDUK$

$a_6=8.01$, $b_6=-9.15$, $c_6=0.77$, $f_6=0.44$, $g_6=-2.36$, $k_6=-0.15$
(−3.34) (6.07) (0.50) (−2.66) (−0.12)
D/C: 0.75, D/W: 0.62

In both equations (5) and (6), Durbin-Watson statistics are small and thus error terms seem to have strong positive correlations. We need further investigation, in this point. However, taking into account of the results in equations (3)–(6), it cannot be denied that foreign exchange rates have some effects on foreign direct investments from other countries to U.S..

So far, we have used the data from 1970 to 1979, but the data of foreign direct investments of manufacturing industry, to U.S. from four countries, are not available for 1970–1972. Therefore, we choose 1973 as a base year and use smaller samples. Regression, using similar equation:

(7) $MUSDI_t=a_7+b_7ER_t+c_7T$

gives us the following results.

$a_7=3.59$, $b_7=-2.82$, $c_7=0.34$
(-5.17) (7.78)
D/C: 0.81, D/W: 1.24

Here, $MUSDI_t$ is a foreign direct investment of manufacturing industry from the four countries to U.S. in year t and T expresses time trend. Using the equation with country dummies,

(8) $MUSDI_t=a_8+b_8ER_t+c_8T+f_8CDF+g_8CDG+k_8CDUK$

we get:

$a_8=3.68$, $b_8=-2.50$, $c_8=0.34$, $f_8=-0.49$, $g_8=-0.63$, $k_8=-0.60$
(-3.59) (8.98) (-2.30) (-2.96) (-2.27)
D/C: 0.87, D/W: 1.81

The above results for manufacturing industry's inflow in U.S. are better than other cases. The developed four countries increase foreign direct investments to U.S. when their foreign exchange rates appreciate for U.S. dallor and the elasticity is between 2–3 in manufacturing industries.

Summarizing the above investigation in this section, it becomes evident that the relation (i) is not supported and the relation (ii) is supported by our data and simple regression analyses.

4. Effects of foreign exchange rate variability

When a foreign exchange rate is fluctuating, a timing of foreign direct investments is a very important factor for investment decisions. Not only the timing but a volume of the investment may also depend on the exchange rate valiability. For a safety-first investor, he will decrease a volume of investments when the fluctuation of foreign exchange rate is large. However, a very aggressive investor may increase it in the case of large fluctuations of exchange rates. In this section, we investigate how foreign direct investments are affected through variabilities of foreign exchange rates.

We now add a new variables, which shows variabilities of foreign exchange rates, for the equations (1)–(6) in the previous section. The new variable is a standard deviation of monthly data of foreign exchange rates, more precisely, a ratio of the standard deviation to mean average of a year.

From the new equations (1)′ and (2)′, which correspond to equations (1) and (2) respectively, we will get the following results, where, SD_t is the new variable.

(1)′ $DI_t=a_1'+b_1'ER_{t-1}+c_1'DI_{t-1}+d_1SD_t$

$a_1'=-0.12$, $b_1'=0.13$, $c_1'=1.10$, $d_1=0.02$
(1.11) (30.21) (2.01)
D/C: 0.97, D/W: 2.07

(2)′ $DI_t=a'_2+b_2'ER_{t-1}+c_2'DI_{t-1}+d_2SD_t+f_2'CDF+g_2'CDG+k_2'CDUK$

$a_2'=-0.17$, $b_2'=0.26$, $c_2'=1.09$, $d_2=0.02$, $f_2'=-0.07$, $g_2'=-0.06$, $k_2'=-0.12$

(1.51) (29.20) (1.99) (−1.21) (−1.07) (−1.74)

D/C: 0.98, D/W: 2.42

The coefficient of SD_t is positive and this show that an increase of foreign exchange variability increases foreign direct investments from U.S. to the developed four countries. However this does not necessarily mean that an increase of foreign exchange risks stimulate foreign direct investments and investors are risk-lover. This is because, an increase of SD_t does not necessarily mean the increase of volatile movement of foreign exchange rates. When foreign exchange rates move fast in one direction, SD_t increases. Therefore, if this is the case, positive values of d_1 and d_2 mean that the faster a one-way movement of foreign exchange rates the more a volume of foreign direct investments is affected. However, as t-values of b_1' and b_2' are small, it is difficult to know whether positive values of d_1 and d_2 help to support the relation (i) or not.

Next, let us investigate the case of inflow of foreign direct investments to U.S., with additional explanatory variable SD_t. Adding SD_t to equations (5) and (6), we have the following equations (5)′ and (6)′ and the regression results.

(5)′ $USDI_t=a_5'+b_5'ER_t+c_5'T+d_5SD_t$

$a_5'=4.43$, $b_5'=-6.57$, $c_5'=0.77$, $d_5=0.21$

(−3.71) (5.69) (1.26)

D/C: 0.68, D/W: 0.47

(6)′ $USDI_t=a_6'+b_6'ER_t+c_6'T+d_6SD_t+f_6'CDF+g_6'CDG+k_6'CDUK$

$a_6'=6.01$, $b_6'=-7.97$, $c_6'=0.74$, $d_6=0.29$, $f_6'=0.77$, $g_6'=-2.25$, $k_6'=-0.51$

(−2.95) (5.99) (1.87) (0.88) (−2.62) (−0.41)

D/C: 0.77, D/W: 0.90

These results again show the existence of positively auto correlated disturbances (i.e. D/W value is small). The t-values of d_5 and d_6 are not very small and if we choose periods of standard deviation with lags (such as SD_{t-1} is used for SD_t) we can get different t-values. These results from equations (5)′ and (6)′, show that standard deviations of foreign exchange rate affect foreign direct investments to U.S. from other four countries. The positive values of the coefficient of SD will imply a behavior of investors to accelerate or delay the timing of foreign investiment with some confidence.

5. Concluding remarks

From our own investigation, it is shown that a foreign exchange rate is not an im-

portant determinant of foreign direct investments from U.S. to other developed countries and is one of the determinants of those from the developed countries to U.S. There will be some reasonings for this. First, a foreign direct investments behavior of U.S. is possibly different from those of other developed countries. The U.S. enterprise usually has advantages for the products with high-technology and with large R & D (research and development) investments. If this is the case, price effects from a foreign exchange rate movement is not a very important factor which affect foreign investments. On the other hand, developed countries which invest in U.S. usually consider the competitiveness to U.S. domestic firms in prices. In this case a foreign exchange rate is an important factor for the decision of location of production points.

Second, the role of U.S. dollor as an international currency might explain some of them. When the developed countries invest in U.S. they often must consider a U.S. dollor value of their funds denominated by their own currencies and thus a foreign exchange rate is a very important factor for their decisions. However, U.S. firms can use U.S. dollor in other counteies, especially in European countries, and an exchange rate is not a crucial factor for their foreign investments descisions.

Third, wage adjustments or wage indexations may be different between U.S. and the other developed countries. In the developed countries, other than U.S., wage adjustments for price changes are fast and thus advantages or disadvantages for investment accompanied with foreign exchange rate movements are canceled out by the adjustment of wages in those countries. Therefore, U.S. firms can neglect of the foreign exchange fluctuations. On the contrary, wage adjustments in U.S. have time lags for price changes, and thus for foreign exchange rates, there remain advantages or disadvantages caused by foreign exchange rate fluctuations. Therefore, foreign investments into U.S. are sensitive to exchange rates.

Lastly, we should mention the problem which is caused by the way of accouting. Both inflows and outflows of foreign direct investments of U.S. are calculated in U.S. dollor. With this calculation, the outfows of foreign direct investments are over-evaluated when U.S. dollor depreciates and are under-evaluated when it appreciates. The inflows of foreign direct investments are over-evaluated when U.S. dollor is depreciated and are under-evaluated when it is appreciated. Therfore, for the period of seventies when U.S. dollor depreciated, foreign direct investment inflows and outflows in U.S. dollor should be adjusted in such a way as outflows increase and inflows decrease in real term. This adjustment will back up to the bad results for relation (i), but will discount the good results for relation (ii).

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TWO TYPES OF RAILROAD REGULATION BY STATES IN THE 19TH CENTURY OF THE U. S.

—Search for the Social Foundation of Modern Corporate Financial Reporting—

Hidetoshi YAMAJI

I

There is a certain consensus on the proposition that the economy and the society of the United States changed at the turn of the century. But, needless to say, the change did not take place in a short time. Evolutional developments occured in such areas as economy, society, politics and so on from the latter half of the 19th century to the early years of the 20th century. Moreover many states in the United States haven't experienced such a development simultaneously. We can find the time lag of modernization among various states.

Turning our attention to the railroad regulation, some states regulated the railroads within the state by fixing the rate directly, while the other states regulated them by using corporate publicity. It seems to me that the difference of regulation form relates to the difference of extent of modernization between two groups of the states.

In taking the cases of two states (Illinois and Massachusetts) as examples, more detailed causes of difference between two types of railroad regulation will be examined in the following sections. This examination will be useful to understand the social foundation of modern corporate financial reporting.

II

In this section, the railroad regulation of the state of Illinois will be analyzed.

Content of railroad regulation. Many times in Illinois, in the 1860s, public opinion demanded that the state regulated the railroad companies. But it was not until 1869 when the Act concerning Railroad Rates was passed that the people of Illinois had

a railroad regulation. This Act, however, rejecting the famous pro-rate principle, didn't have any concrete alternative procedures of rate setting so that it was not enforced effectively.

Thus, it can be said that in Illinois the Constitution of 1870 was the first real railroad regulation law. When the fourth constitutional convention was held, most delegates didn't have a plan to contain the railroad regulation sections in the Constitution. But during the period of the convention opening, the pressure of public opinion, which consisted mainly of farmers' opinion, forced the delegates to pass the sections concerning railroad regulation which was proposed by R. Benjamin.[1)]

This Constitution was decided by the direct voting of electors. In regard to the Constitution as a whole, it was passed by a vote of 134,227 to 35,443 and the sections concerning railroad regulation were also passed by a vote of 144,750 to 23,525.[2)] They were quoted under:

> *Section 12.* Railways ... are hereby declared public highways, and shall be free to all persons for the transportation of their persons and property thereon, under such regulations as may be prescribed by law. And the General Assembly shall, from time to time, pass laws establishing reasonable maximum rates of charges for the transportation of passengers and freight on the different railroads in this state.
> *Section 15.* The General Assembly shall pass laws to correct abuses and to prevent unjust discrimination and extortion in the rates of freight and passenger tariffs on the different railroads in this state, and enforce such laws by adequate penalties, to the extent, if necessary for that purpose, of forfeiture of their property and franchises.[3)]

Following the Constitution convention, in 1871, was enacted the law establishing reasonable maximum rates of charges for the transportation of passengers which prescribed many concrete regulatory laws and enabled the Board of Railroad and Warehouse Commissioners to be established. The enactment of the Act of 1871 was partly due to the rise of the Granger Movement in Illinois.

Turning our attention to the content of the railroad regulation prescribed by this Act, a reporting system, or in other words, a publicity system was adopted to regulate the rates of railroad transportation. That is to say, the railroad companies were required to report to the Board their annual gross earnings and some other accounting data on which it classified railroads from A rank to D rank to recommend the maximum rate of each rank. After that, the Board disclosed the ranking and the

1) J. Cornelius, *A History of Constitution Making in Illinois*, University of Illinois, Illinois, 1969, pp. 58–59.

2) S.J. Buck, *The Granger Movement*, University of Nebraska Press, Lincoln, Originally published in 1913, p. 128.

3) *Ibid.*, pp. 129–130.

rates in the newspapers.[4]

But the Board had no means and no power other than publicity to enforce its recommendations. So it didn't take any real actions even if a railroad violated its recommendations or adopted discriminative rate system. It was only the person (or party) concerned who could sue the railroad for damages. Railroads were too big for an individual to bring an action against them so that he couldn't be paid for the damage which accrued from illegal rates. This fact means that the railroad regulation by publicity didn't function effectively.[5]

Ineffectiveness of the 1871 Act provoked the revision of railroad regulation law in 1873. According to the Act of 1873, the Board could decide the maximum rates of railroad transportation and could bring suits if necessary. Namely in 1873, the railroad regulation form of Illinois changed from publicity to direct control of business.[6]

It should be added that railroad companies sued the state for the Act of 1873 being in violation of the Federal Constitution. This famous case—Mann vs. Illinois in 1876—was called Granger Case. The suit was rejected by the Supreme Court.

Subsequently we must make clear the reasons why in Illinois the railroad regulation by publicity became ineffective and the direct control of business could not help being adopted.

Social Structure. First of all, attention must be paid to the conditions of farmers because the farmer class was thought to be the main social class which established the railroad regulation in Illinois.

In the 1860s, Illinois farmers suffered from the oppressivly high rate system of railroad transportation and the discriminative rate system because the farmers had not yet organized themselves to take some counter measures against railroad companies. At this time farmers throughout the United States suffered from these disadvantages.

Seeing farmers suffer from high rates of railroad transportation, in 1867, O.H. Kelley organized the first grange in Minnesota. This was the beginning of the Granger Movement, which developed throughout the United States in provoking the anti-monopoly, that is, the anti-railroad sentiment among farmers. The statistics concerning the development of the Granger Movement in Illinois is shown in Table I.[7] Judging from Table I, it seems that the anti-railroad sentiment of farmers affected

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4) *First Annual Report of the Railroad and Warehouse Commission of the State of Illinois*, 1872, pp. 4–5.

5) *Ibid.*, pp. 5–6.

6) *Fourth Annual Report of the Railroad and Warehouse Commission of the State of Illinois*, 1874, pp. 9–10.

7) C.C. Taylor, *The Farmers' Movement*, 1620–1920, American Book Company, New York, 1953, pp. 135–137.

Table I. The number of granges from 1868 to 1876 in Illinois

1868	1869	1870	1871	1872	1873	1874	1875	1876
—	2	3	8	—	431	1.503	1.533	646

Table II. The Population Structure of Illinois by Occupation

All Occupations	Agriculture	Professional & Personal Service	Trade & Transportation	Manufactures, Mechanical & Mining Industries
742,015	376,441	151,931	80,422	133,221
100%	51%	20%	11%	18%

especially the enactment of the railroad regulation law of 1873. Furthermore, it should be kept in mind the population structure of Illinois by occupation in this period which was as follows. (Table II)[8] According to the Table II, about one-half of population was farmer and the major part of the other half consisted of small producer and private business so that the polarization between farmers and railroads could occur. This antagonism was sharply strenthened by the industrial structure in Illinois. In 1870, the gross value of manufactured products totaled $92 million in Cook County, where the main offices of the railroad companies were gathered, while the next highest county total was only $8 million in Peoria County.[9] In Illinois, there was also antagonism between the urban and the rural communities in regard to industrialization. These antagonisms necessarily led the railroad regulation of Illinois to the rigid and direct control of business.

Management of Railroad Company. The factor which forced the state to adopt the direct control of business as railroad regulation lies in the state of affairs of railroad company management. The management of the Illinois Central Railroad serves as an example.

The conditions which confronted the management of the Illinois Central from 1857 to 1870 were peculiar. Panics, crop failures and the Civil War prevented the natural development of the system and forced it into policies not suited to its geographical location. Moreover, the officers of the company were handicapped by its foreign control and often adopted more conservative methods than would have been followed under a different system of ownership. It may be said in this connection that the securities issued by the company were sold mainly in the British capital market. As a result, the company couldn't pursue the policy adopted by some of the more aggressive of its competitors and often lost traffic as a result. Moreover, many of the successes obtained by the Illinois Central from 1858 to 1870 were merely

8) Calculated from *The 9th Census of the United States.*

9) J. Cornelius, *op. cit.*, p. 43.

temporary, and they inflicted later losses upon the company.[10]

From these reasons, the company adopted the policies from which weak farmers suffered and it sold the land which was previously donated by the state.

Judging from the typical railroad management, the railroad companies in Illinois were in a position of free competition which in turn forced them into an unstable management. In such a condition, railroads couldn't help adopting oppressive management policies against farmers. Conversely speaking, railroads couldn't afford to take the demand of farmers (or the public) into account. It seems that this fact stimulated the anti-railroad sentiment of farmers and led necessarily the railroad regulation to direct control of business.

III

In this section, the railroad regulation of the state of Massachusetts will be examined. *Content of the railroad regulation.* In the state of Massachusetts, the Act of 1869 regulated railroad companies within the state and established the Board of Railroad Commissioners to which the following duty was assigned:

> The first duty imposed upon the Commissioners was to examine the railroad of the State, with a view to keeping themselves informed as to their condition, the manner in which they are operated with reference to the security and accommodation of the public, and the compliance of the several railroad corporations with the provisions of their charters and the laws of the Commonwealth.[11]

To perform its duty, the Board had two measures; one was to require the railroad companies of the State to report their business conditions and to inform them of the improvements and changes which the Board adjudged to be proper; the other was to visit and inspect all the railroads within Massachusetts if necessary.[12] That is to say, it can be said that only publicity was given to the Board as a regulatory measure. This measure is similar to the one adopted in Illinois in 1871. In Illinois this regulatory measure was forced to change while in Massachusetts it didn't change. And according to A. T. Hadley, the railroad regulation of Massachusetts was successful,[13] which would be partly shown in Table III.[14] Table III tells us that in two

10) H.G. Brownson, *History of the Illinois Central Railroad to* 1870, University of Illinois, Illinois, 1915 (Reprinted in 1967), p. 73.

11) *First Annual Report of the Board of Railroad Commissioners*, Massachusetts, 1870, p. 4.

12) *Ibid.*, pp. 5–6.

13) A.T. Hadley, *Railroad Transportation, Its History and Its Laws*, G.P. Putnam's Sons, New York, 1903, pp. 137–139.

14) *Sixth Annual Report of the Railroad and Warehouse Commission of the State of Illinois*, 1876, pp. 446–447. *Seventh Annual Report* (Appendix), pp. 70–71. *Eighth Annual Report* (Appendix), pp. 84–85. *Tenth Annual Report*, p. 17. *Twelofth Annual Report of the Board of Railroad Commissioners of the State of Massachusetts*, 1881, p. 12.

Table III. The Average Fare per Mile Received from Each Passenger (¢)

Year	Massachusetts	Illinois
1873	2.32	3.42
1874	2.30	3.33
1875	2.42	3.19
1876	2.40	3.10
1877	2.40	3.07
1878	2.40	3.18
1879	2.12	3.14
1880	2.24	2.89

states, the average fares per mile gradually dropped down regardless of the difference of regulations.

Then, why in Massachusetts was the railroad regulation by publicity successful? The reasons will be made clear in this section, following the same course as previous section.

Social Structure. The state of Massachusetts was a center of the 13 Eastern States after the Independence. And it had perhaps already a large population in about 1800, judging from the fact that the population increased by degrees.

Boston, the leading city in Massachusetts was also the central port of the world-trade. Thus, Boston and some other cities in Massachusetts could early have had a large capital by accumulating the profits accrued from the trades. But as New York supplanted Boston as a center of world-trade, it became necessary for merchants and industrialists of Boston to invest their large capital in railroads for the purpose of organizing the transportation system within the state and of securing the connection with the inland area.[15]

Moreover, when Boston lost in a contest with New York for supremacy of world-trade, the capital used in the trades began to seek other investments. This extra-capital raised textile industry and iron industry in Massachusetts, which was the beginning of the industrial revolution in the United States. The industrial conditions of 1830s in Massachusetts was shown in Table IV, derived from the McLane Report.[16] In addition, agriculture developed in Worcester. In the 1830s–1840s there had already appeared in Massachusetts a mature economy where commercial capital, banking capital, industrial capital and agriculture were established as stable interest groups. These interest groups in turn had enough countervailing power to check railroad managements, which was one of the main reasons why in Massachusetts the railroad regulation by publicity was successful.

15) S. Salsbury, *The State, the Investor, and the Railroad*; *The Boston* and *Albany*, 1825–1867, Harvard University Press, Massachusetts, 1967, chapter I.

16) From, T. Kusui, *American Capitalism and Industrial Revolution*, Kobundo, 1970, pp. 463–497, which explains the McLane Report minutely. (in Japanese)

Table IV. Industrial Development in Massachusetts

	Textile Industry			Iron Industry (steel)		
	employee	factory	capital	employee	factory	capital
Berkshire	638	18	341,100	(100)	(1)	(11,000)
Bristol	2,404	46	1,499,700	261	3	156,000
Essex	355	2	270,000	28	4	4,030
Franklin	15	1	4,500	—	3	1,550
Hampden	1,329	5	1,014,000	—	—	—
Hampshire	391	4	537,200	—	—	—
Middlesex	3,577	12	4,070,699	—	11	86,825
Norfolk	649	19	585,900	77	7	77,350
Plymouth	388	13	193,390	567	14	709,684
				(12)	(3)	(8,200)
Boston (Suffork)	—	—	—	341	4	744,800
Worcester	2,839	45	1,938,250	86	16	53,370

Management of Railroad Company. Next, the conditions of railroad managements should be analyzed. In particular, the ones of the Boston and Worcester Railroad and the Western Railroad would be quoted as examples.

The Boston and Worcester Railroad, opened to traffic in 1834, was one of the oldest railroads in Massachusetts. An interesting occurrence concerning management policy was the controversy between D. Denny, C. D. Henshow and W. Hale over the rate policy. D. Denny and C. D. Henshow asserted that the rate of transportation should be low for the purpose of meeting the demand of the public, while W. Hale insisted that the rate should be raised to satisfy the profit maximizing principle. The overcoming of W. Hale temporarily brought the rate to be raised. But a few years later, the rate was cut when the earnings of the company increased,[17] because the board of directors realized that satisfying the public interest was prudent management policy.

Turning to the Western Railroad, while under construction, in Worcester a mass meeting was held to demand to the company the joint resolution concerning the location of railroad stations upon which the value of real estates depended. On the other hand, the railroad published bulletins titled "Address to the People" to persuade the public opinion.[18]

The controversy over rate policy also arose between E. H. Derby and W. Jackson who were directors of the Western Railroad. In this dispute, E. H. Derby disclosed accounting data concerning the rate making in a newspaper to obtain the support of the public opinion.[19]

The above-mentioned cases tell us that railroad companies in Massachusetts

17) S. Salsbury, *op. cit.*, p. 125.
18) *Ibid.*, p. 146.
19) *Ibid.*, pp. 213–214.

were forced to adopt management policy in taking many interested groups into account. Under such a circumstance, checking railroad managements by publicity could be a good measure to regulate railroad companies.

Viewed from the railroad company side, railroads had enough reserve to consider many interested groups, that is, the public interests and realized that they could maximize the long-term profit on condition that they met the public interest.[20] This conjecture could be also drawn from the fact that the dividends of the two

Table V. Development of dividends of two companies

Year	Boston & Worcester R.R.			Western R.R.		
	Gross Earnings	Total Costs	Dividend Rates	Gross Earnings	Total Costs	Dividend Rates
1834–1835	$ 161,806.95	$ 85,533.28	2	—	—	—
1836	183,189.03	103,674.69	4	—	—	—
1837	209,261.31	119,062.49	5–3	—	—	—
1838	212,325.03	93,492.97	3–3	—	—	—
1839	231,807.18	126,384.83	3–3½	$ 17,609.15	$ 14,380.64	—
1840	267,547.41	140,441.00	3–3	112,347.39	62,071.72	—
1841	310,807.87	162,998.58	3–3	182,308.99	132,501.45	—
1842	349,206.67	168,509.51	4–4	512,688.28	266,619.30	—
1843	383,367.10	206,641.42	3–3	573,882.51	303,973.06	—
1844	428,437.34	233,273.92	3–3½	753,752.72	314,074.20	—
1845	487,455.53	249,729.50	4–4	813,480.15	370,621.25	3–3
1846	554,712.46	283,876.11	4–4	878,417.89	412,679.80	2–3
1847	722,170.32	381,985.63	4–5	1,325,336.06	676,689.75	3–4
1848	716,284.11	381,917.42	5–4½	1,332,068.29	652,357.11	4–4
1849	703,361.15	405,551.05	4–3	1,343,810.57	588,323.58	4–4
1850	757,946.79	377,041.03	3–3	1,366,252.47	607,549.36	4–4
1851	743,922.60	393,687.03	3½–3½	1,353,894.63	597,756.20	4–4
1852	758,819.47	409,740.26	3½–3½	1,339,373.09	656,687.17	4–3½
1853	887,219.87	455,528.01	3½–3½	1,525,223.02	778,487.92	3–3½
1854	952,895.28	594,528.56	3½–3½	1,763,944.26	1,045,241.19	3½–3½
1855	1,008,004.90	603,542.89	3–3	1,858,861.75	1,236,659.74	3½–3½
1856	1,108,781.90	671,719.87	3½–3	2,115,820.05	1,228,219.46	3½–3½
1857	1,019,148.70	612,686.42	4–3	1,910,342.48	1,084,118.55	4–4
1858	923,223.63	570,929.36	3–3	1,700,293.50	890,930.40	4–4
1859	1,067,070.73	565,434.51	3–3	1,767,068.13	936,920.12	4–4
1860	1,045,683.01	606,398.88	4–4	1,881,350.72	993,096.30	4–4
1861	928,932.79	520,338.40	4–4	1,894,567.96	1,081,571.17	4–4
1862	1,006,129.82	515,825.72	4–4	2,095,922.50	1,111,358.20	4–4
1863	1,202,654.05	714,296.29	4–4	2,435,712.14	1,207,006.90	4–4
1864	1,471,985.08	984,520.45	5–5	2,994,998.74	1,818,141.71	5–5
1865	1,697,164.10	1,160,100.47	5–4½	3,431,584.10	2,204,925.58	5–4
1866	1,914,729.54	1,424,528.21	5½–5	3,932,017.29	2,525,226.58	6–5
1867	—	——	5–5	4,086,707.63	2,837,411.77	5–5

20) A.T. Hadley, *op. cit.*, p. 138.

companies gradually arose and were kept stable as shown in Table V.[21]

Then, what do they mean the sufficient reserve and the stable dividends? They mean that the railroad companies in Massachusetts had already enjoyed the oligopolistic (or monopolistic) stability. Generally speaking, it can be said that the oligopolistic stability of railroads could assure high quality transportation and management, while the free competition accelerated railroad constructions.

IV

As a conclusion, we summarize the discussions which were developed in previous sections.

As in the 1860s–1870s there didn't yet emerge the modern socio-economic structure whose nucleus was big business, the antagonism between farmers and railroads as a new comer of big business appeared in Illinois. And it was in turn the main reason why railroad regulation by publicity was rejected and the direct control of business was forced to be adopted as regulatory measure in Illinois.

On the other side, it should be kept in mind that in 1830s–1840s of Massachusetts there had already emerged many interested groups in contrast to the antagonistic condition of Illinois and there had also appeared the oligopolistic stability of railroad companies as compared with the free competitive condition of Illinois. These factors could explain why the railroad regulation by publicity was valid in Massachusetts.

Furthermore, it should be added that there was a democratic tradition in the United States. This means that the senses of "the public's right to know" and "the sovereignity rests with the people" were firmly established in the American people's mind. It seems that these senses of rights also validated the big business (railroad) regulation by publicity. Namely the regulation by publicity is valid provided that the public expect that they can watch the behavior of big business and can regulate them through democratic government if necessary.

We can say that only when socio-economic factors and an ethical and ideological factor (democracy) are met simultaneously, the regulation or control by publicity becomes valid. This proposition is very significant for accountancy because it means that corporate financial reporting can be established as a social institution only in modern democratic society which satisfies those factors.

Reference

[1] Adams, C. F., Jr., and H. Adams, *Chapters of Erie*, Augustus M. Kelly, New York, 1967, originally published in 1871.

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RESEARCH INSTITUTE FOR ECONOMICS AND BUSINESS ADMINISTRATION, KOBE UNIVERSITY

HISTORICAL SKETCH

In 1919, a research organization named the Institute for Commerce was founded in Kobe Higher Commercial School, one of the chief predecessors of Kobe University, with a gift made by F. Kanematsu & Company, a leading mercantile firm in Kobe. The organization was designed to carry on and facilitate integrated research on business and commerce and to formulate and publish the results of these studies and investigations in such form as to make them available to the business community.

With the founding of Kobe University of Commerce, successor of Kobe Higher Commercial School, in 1929, the Institute extended its research activities by adding several divisions. One was the famous Latin-American Library, which soon became the center of research in this field in Japan. A room for statistics equipped with various computing machines was established and began publication of *Jūyō Tōkei Keizai* monthly and *Sekai Bōeki Tōkei* annually. A filing room was prepared to deposit press clipping files systematically arranged by topics and dates. Another room was designed to become the center of all possible original records and data having to do with the beginning and progress of Japanese business.

On the campus of Kobe University of Commerce, another organization named the Institute for Business Mechanization was founded in 1941 utilizing business machines donated by the IBM Corporation and others. With Professor Yasutaro

Hirai as its head a broad and forward-looking plan for business mechanization in Japan was developed.

In 1944, Kobe University of Commerce changed its name to Kobe University of Economics. After the War, however, the University was consolidated with three other colleges in Hyogo Prefecture to become Kobe University. With this development, the two Institutes were also amalgamated into the Research Institute for Economics and Business Administration, Kobe University. At present, the Institute, with its seventeen full-time professional staff members, carries on studies and investigations in international economic, international environment, comparative economic, international business and management information systems.

LOCATION AND BUILDINGS

The Research Institute for Economics and Business Administration is located on the campus of Kobe University, Rokko, Kobe. It consists of two three-storied buildings. One is named the Kanematsu Kinenkan and has a floor space of about 2,900 square meters, which includes a president's room, forty-one offices, six rooms used as a library, a room for statistics, etc. Another is built in 1964. It has a floor space of about 1,900 square meters, which is chiefly used as the Documentation Center for Business Analysis, a library and a conference room.

ORGANIZATION

Under the directorship of the president, the Institute operates with five research sections. Each section and its research subjects are as follows:

1. **International Economic Studies**
   - International Economics
   - International Monetary Economics
   - Maritime Economics
   - International Labor Relations
2. **International Environmental Studies**
   - Resource Development
   - International Organizations
   - International Industrial Adjustment
3. **Comparative Economic Studies**
   - Pacific Basin I
   - (Oceanian Economy)
   - Pacific Basin II
   - (North and South American Economics)
4. **International Business Studies**

Comparative Business
Multinational Enterprise
International Business Finance

5. Management Information Systems

Business and Accounting Information
Information Processing System
International Comparative Statistics

Besides the regular work of the Institute, research committees may be created to carry on special works requiring joint studies of academic and business circles. At present, there are five standing research committees, as follows: Experts Group on the World Trade Structure, Committee of International Finance, Committee of Information Systems, Committee of Oceanian Economy and Committee of Maritime Economics.

For convenience and greater efficiency in carrying out its research activities, the Institute has a general office which is responsible for 1) the collection and preservation of a comprehensive collection of books, periodicals, pamphlets, and original records and data of finance, trade, commerce, industry and business generally; 2) the classification, cataloguing, indexing arranging, annotation and compilation of these research materials; and 3) the formulation and publication of the results of the investigations and studies accomplished by the professional staff members of the Institute.

As an affiliated institute, the Documentation Center for Business Analysis has been established in 1964. It is the first systematic information facilities in the field of business administration in Japan that has been recognized and authorized by the Ministry of Education. The purpose is to collect and to make intensive control of all kinds of materials on business administration and to make them available to scholars, universities, governments, and business world with the aid of modern documentation techniques.

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