CONTENTS

The Change of Spatial Characteristics of Industries in Japan

.............................................................. Minoru Beika 1

Functions of Screen Account

.............................................................. Nobuko Nose 19

On Mr. Stoleru's Optimal Policy for Economic Growth

.............................................................. Hikoji Katano 31

A Note on Shorter Working Hours for Seamen

.............................................................. Hiromasa Yamamoto 39

Objectivity Reexamined

.............................................................. Isao Nakano 47

A Note on the Behavioral Theory of Innovation

.............................................................. Hideki Yoshihara 55
THE CHANGE IN REGIONAL CHARACTERISTICS OF INDUSTRIES IN JAPAN

Minoru Beika

I Introduction

The necessity of re-examining the "National Regional Development Plan" begun in 1962, and due to be completed in 1970, has been gradually noticed because of apparent gaps between the political aims and the actual change. The government authorities in Japan, having admitted the situation, started their examination in the spring of 1965 and set forth the interim report in 1966 and the final report in 1967. This year they are trying to publish the "New National Regional Development Plan", due to be completed in 1985 on the basis of these two reports. The writer's concern in this article is not in the contents of these plans, but in how the problem of industrial location, which has a considerable bearing on the problem, is treated, and in what kinds of problems are found in them.

The reports mentioned above pointed out the tendency of industrial location — dividing the industries into two main types — "foot-tight" and "foot-loose."

The industries called "foot-tight" here are to a considerable extent limited by local conditions. These industries include lumber and wood products, paper, pulp, pottery etc. which are the raw material-oriented industries, and petroleum refining, chemicals, steels, ship building which are located in coastal areas. They are mainly located in the three central industrial districts in Japan, but are located in other local districts as well.

"Foot-loose" type industries, or the other hand, are generally taken to be the high value-added industries which are rather free in location, including electric machinery, precision engineering and other higher processed engineering industries (so-called growth industries). In the case of Japan, in addition, their tendency to concentrate strongly in the three central industrial districts is a distinctive feature.

The final report concludes that foot-loose type industries, which have shown extreme concentration until the present, ought to be literally foot-loose, and to contribute to the development of local districts, admitting the notable roles foot-tight industries will play from now on in the development of local districts.
Having divided Japanese main industries into foot-tight and foot-loose types, the writer, in this article, intends to focus on the following point: the extreme concentration of the foot-loose type, contrary to its name, is a remarkable tendency compared with the actual conditions in western countries.

The writer's concern in this area originated from his previous study on the regional characteristics of Japanese industries with British and American ones, based on the study of Professor P. S. Florence who had grasped the characteristics of industrial locations in U.S. and Britain by the concept of regional concentration. (P.S. Florence "The Logic of British and American Industries" 1953). The writer has previously published a comparative study between Japanese and British, American industries, focusing on their relation to the business features of industrial location in Japan using the 1951–52 data, using the method of Professor Florence (M. Beika "Spatial Characteristics of Industries Relating to their Business Features" The Kobe Economic & Business Review 2, 1954). In this article, the writer is going to investigate the change in Japanese industries on the basis of 1956 and 1966 data. The main point of investigation will be the characteristic change of foot-loose type industries during these ten years.

II Study on Change using Florence's method

Professor P.S. Florence, a well-known scholar in the studies of industrial organization and business structure, still working actively in his old age, has a great influence in Britain on the study of location theory as well. Recently he has caught the attention of Japanese scholars in this field. In this chapter, the writer intends to study the regional concentration and management conditions in Japan by types, and refer to the problems related to regional concentration, the concept of which prompted this study, as the premise to the main subject.

The term, regional concentration, used here means the comparison between the regional (prefectural in our case) distribution rate of the workers in a certain industry and that of the total number of workers in all industries. And its coefficient is obtained by deducting the former from the latter for each prefecture, and summing up all the plus and minus deviations of the distribution rates of workers in a certain industry compared with the distribution rates of workers in all industries. That means the nearer the distribution of a certain industry is to that of all industries, the nearer the coefficient is to zero. The more the distribution differs, the nearer the coefficient is to 100 per cent. However, whereas Florence used occupied persons as norms, the writer has used the total number of industrial workers instead. The writer has adopted Professor Florence's method of portraying the characteristics of each industry by classifying them in
THE CHANGE IN REGIONAL CHARACTERISTICS
OF INDUSTRIES IN JAPAN

terms of number of workers, admitting the considerable connection between the
features of regional concentration and the business features of each industry.

In addition, the writer has supplemented the data on the actual concentra-
tion of each industry in three leading prefectures, fearing that, while such a
coefficient of localization somehow indicates the extent of concentration of
industries relatively on the one hand, it might make the overall concentration
unclear on the other.

In conclusion, Professor Florence, relating the coefficient of localization to
plant size, grasped the logic of industries inductively when he compared British
and American industries and found the points of similarity between them. But
it is the writer's finding that the Japanese condition forms a considerable contrast
with British and American conditions, as regards foot-loose type industries,
following the terms used before.

No small change can be found between the data of 1956 and the data of
1966.

III The regional concentration in 1956 and plant size

Combining the data gained from the "1956 Census of Japanese Manufac-
tures" and the same indexes noted above, the writer completed Table 1. The
writer only suggests his conclusive viewpoint here because of space limitations.
Seven types were devised by the writer in connection with industrial location
and business features in Japan, and they were put together in Table 1, for want
of space in classifying all industries by types.

Combining each item in the Table and considering the actual conditions of
each industry, the writer devised seven types as follows:

Type 1. Industries which are closely related each other and are concen-
trated chiefly in a few central industrial districts

They include large, medium and small plants, for which regional concentra-
tion is a prerequisite demand. One distinctive feature of this type is the heavy
concentration in the three central industrial districts, especially in the Keihin
area. Machine industry, electric machinery etc. — all of them are higher pro-
cessed engineering industries and are typical examples of the foot-loose type.

Type 2. Industries consisting mainly of large plants located both in the
central industrial districts and other local industrial areas

They are big plants which are located not only in the central industrial
districts but in other local industrial areas, depending upon the local conditions
such as ports, transportation, water, electricity, special raw materials, etc. Some
typical examples are iron and steel, shipbuilding, chemical fertilizer. Pulp,
Table 1. Coefficient of Localization and Size of Plant in 1956

<table>
<thead>
<tr>
<th>Group of Industry</th>
<th>Coefficient of Localization</th>
<th>3 Leading Prefectures</th>
<th>Percentage of Workers (No. of workers) by Size of Plant</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td></td>
<td>I</td>
<td>II</td>
</tr>
<tr>
<td>1 Pottery</td>
<td>72 80 Aichi Gifu Mie</td>
<td>47.4</td>
<td>13.2</td>
</tr>
<tr>
<td>2 Surveying instruments</td>
<td>70 85 Tokyo —</td>
<td>30.9</td>
<td>69.1</td>
</tr>
<tr>
<td>3 Lacquer ware</td>
<td>68 59 Ishikawa Kagawa</td>
<td>73.8</td>
<td>26.2</td>
</tr>
<tr>
<td>4 Natural resin and wood chemical products</td>
<td>64 52 Kagoshima Hyogo Miyazaki</td>
<td>85.2</td>
<td>14.8</td>
</tr>
<tr>
<td>5 Optical instruments and lenses</td>
<td>61 81 Tokyo Nagano Saitama</td>
<td>36.8</td>
<td>11.6</td>
</tr>
<tr>
<td>6 Silk reeling plants</td>
<td>61 41 Nagano Gunma Yamanashi</td>
<td>19.9</td>
<td>6.4</td>
</tr>
<tr>
<td>7 Watches and clocks</td>
<td>61 84 Tokyo Aichi Nagano</td>
<td>19.2</td>
<td>10.2</td>
</tr>
<tr>
<td>8 Musical instruments</td>
<td>60 82 Shizuoka Tokyo Aichi</td>
<td>26.4</td>
<td>33.0</td>
</tr>
<tr>
<td>9 Clay refractories</td>
<td>59 53 Okayama Hyogo Aichi</td>
<td>13.1</td>
<td>11.9</td>
</tr>
<tr>
<td>10 Electric measuring instrument</td>
<td>57 74 Tokyo Hiroshima Nagano</td>
<td>26.4</td>
<td>17.7</td>
</tr>
<tr>
<td>11 Shipbuilding</td>
<td>54 50 Hyogo Hiroshima Kanagawa</td>
<td>9.7</td>
<td>3.6</td>
</tr>
<tr>
<td>12 Medical instruments</td>
<td>53 70 Tokyo Kyoto Saitama</td>
<td>69.4</td>
<td>30.6</td>
</tr>
<tr>
<td>13 Pens and pencils</td>
<td>51 75 Tokyo Osaka Kanagawa</td>
<td>47.6</td>
<td>7.0</td>
</tr>
<tr>
<td>14 Electric bulbs</td>
<td>50 79 Tokyo Osaka Kanagawa</td>
<td>38.4</td>
<td>12.5</td>
</tr>
<tr>
<td>15 Communication equipment</td>
<td>50 78 Tokyo Kanagawa Osaka</td>
<td>20.1</td>
<td>11.4</td>
</tr>
<tr>
<td>16 Ropes and nettings</td>
<td>49 49 Hokkaido Aichi Mie</td>
<td>34.0</td>
<td>11.6</td>
</tr>
<tr>
<td>17 Drugs and medicines</td>
<td>48 63 Tokyo Osaka Toyama</td>
<td>27.3</td>
<td>12.9</td>
</tr>
<tr>
<td>18 Bicycles, rear cars</td>
<td>48 82 Osaka Tokyo Aichi</td>
<td>21.2</td>
<td>28.8</td>
</tr>
<tr>
<td>19 Paper mills</td>
<td>46 39 Shizuoka Hokkaido Tokyo</td>
<td>19.4</td>
<td>10.7</td>
</tr>
<tr>
<td>20 Chemical fertilizers</td>
<td>45 30 Niigata Fukuoka Toyama</td>
<td>1.4</td>
<td>0.7</td>
</tr>
<tr>
<td>21 Sea food products</td>
<td>44 32 Shizuoka Hokkaido Chiba</td>
<td>64.9</td>
<td>11.4</td>
</tr>
<tr>
<td>22 Oils and Paints</td>
<td>44 74 Tokyo Osaka Hyogo</td>
<td>33.0</td>
<td>14.3</td>
</tr>
<tr>
<td>23 Railroad equipment</td>
<td>44 50 Osaka Aichi Hyogo</td>
<td>9.3</td>
<td>4.8</td>
</tr>
<tr>
<td>24 Rollingmills, except smelting and steel works</td>
<td>43 64 Osaka Tokyo Hyogo</td>
<td>25.2</td>
<td>16.9</td>
</tr>
<tr>
<td>No.</td>
<td>Industry</td>
<td>Prefecture</td>
<td>City</td>
</tr>
<tr>
<td>-----</td>
<td>----------------------------------------------</td>
<td>---------------</td>
<td>--------------</td>
</tr>
<tr>
<td>25</td>
<td>Sugar</td>
<td>Hokkaido</td>
<td>Tokyo</td>
</tr>
<tr>
<td>26</td>
<td>Paper products</td>
<td>Aichi</td>
<td>Tokyo</td>
</tr>
<tr>
<td>27</td>
<td>Textile machinery</td>
<td>Osaka</td>
<td>Aichi</td>
</tr>
<tr>
<td>28</td>
<td>Household electric appliances</td>
<td>Ibaragi</td>
<td>Osaka</td>
</tr>
<tr>
<td>29</td>
<td>Canned fruits and vegetables</td>
<td>Shizuoka</td>
<td>Tokyo</td>
</tr>
<tr>
<td>30</td>
<td>Industrial inorganic chemicals</td>
<td>Yamaguchi</td>
<td>Kagawa</td>
</tr>
<tr>
<td>31</td>
<td>Motor vehicles</td>
<td>Tokyo</td>
<td>Aichi</td>
</tr>
<tr>
<td>32</td>
<td>Animal and vegetable oil and fats</td>
<td>Hyogo</td>
<td>Kanagawa</td>
</tr>
<tr>
<td>33</td>
<td>Metal working machinery</td>
<td>Tokyo</td>
<td>Osaka</td>
</tr>
<tr>
<td>34</td>
<td>Tincans</td>
<td>Tokyo</td>
<td>Osaka</td>
</tr>
<tr>
<td>35</td>
<td>Dyeing and finishing textiles</td>
<td>Aichi</td>
<td>Osaka</td>
</tr>
<tr>
<td>36</td>
<td>Woven fabric mills</td>
<td>Aichi</td>
<td>Osaka</td>
</tr>
<tr>
<td>37</td>
<td>Heating apparatus</td>
<td>Tokyo</td>
<td>Osaka</td>
</tr>
<tr>
<td>38</td>
<td>Toys and sporting goods</td>
<td>Tokyo</td>
<td>Aichi</td>
</tr>
<tr>
<td>39</td>
<td>Structural clay products</td>
<td>Aichi</td>
<td>Osaka</td>
</tr>
<tr>
<td>40</td>
<td>Rubber products</td>
<td>Hyogo</td>
<td>Fukuoka</td>
</tr>
<tr>
<td>41</td>
<td>Metal stamping</td>
<td>Tokyo</td>
<td>Osaka</td>
</tr>
<tr>
<td>42</td>
<td>Glass</td>
<td>Tokyo</td>
<td>Osaka</td>
</tr>
<tr>
<td>43</td>
<td>Agricultural machinery</td>
<td>Niigata</td>
<td>Osaka</td>
</tr>
<tr>
<td>44</td>
<td>Yarn and thread mills</td>
<td>Aichi</td>
<td>Gifu</td>
</tr>
<tr>
<td>45</td>
<td>Paper coating</td>
<td>Tokyo</td>
<td>Aichi</td>
</tr>
<tr>
<td>46</td>
<td>Rolling of non-ferrous metals</td>
<td>Tokyo</td>
<td>Osaka</td>
</tr>
<tr>
<td>47</td>
<td>Table ware and cutlery</td>
<td>Osaka</td>
<td>Niigata</td>
</tr>
<tr>
<td>48</td>
<td>Miscellaneous metal products</td>
<td>Tokyo</td>
<td>Osaka</td>
</tr>
<tr>
<td>49</td>
<td>Fabricated wire products</td>
<td>Osaka</td>
<td>Tokyo</td>
</tr>
<tr>
<td>50</td>
<td>Office machines</td>
<td>Osaka</td>
<td>Tokyo</td>
</tr>
<tr>
<td>51</td>
<td>Measuring instruments</td>
<td>Tokyo</td>
<td>Osaka</td>
</tr>
<tr>
<td>52</td>
<td>Flour and grain mills products</td>
<td>Hokkaido</td>
<td>Aichi</td>
</tr>
<tr>
<td>53</td>
<td>Electric wire and cable</td>
<td>Tokyo</td>
<td>Kanagawa</td>
</tr>
<tr>
<td>#</td>
<td>Section</td>
<td>Code</td>
<td>Page</td>
</tr>
<tr>
<td>----</td>
<td>----------------------------------</td>
<td>------</td>
<td>------</td>
</tr>
<tr>
<td>54</td>
<td>Iron and steel</td>
<td>33</td>
<td>41</td>
</tr>
<tr>
<td>55</td>
<td>Steel forgings and castings</td>
<td>32</td>
<td>42</td>
</tr>
<tr>
<td>56</td>
<td>Industrial organic chemicals</td>
<td>32</td>
<td>46</td>
</tr>
<tr>
<td>57</td>
<td>Knitting mills</td>
<td>32</td>
<td>49</td>
</tr>
<tr>
<td>58</td>
<td>Electrical generating and</td>
<td>32</td>
<td>46</td>
</tr>
<tr>
<td>59</td>
<td>General industry machinery</td>
<td>32</td>
<td>54</td>
</tr>
<tr>
<td>60</td>
<td>Seasonings</td>
<td>31</td>
<td>23</td>
</tr>
<tr>
<td>61</td>
<td>Sawmills and Planing mills</td>
<td>31</td>
<td>21</td>
</tr>
<tr>
<td>62</td>
<td>Miscellaneous machinery</td>
<td>30</td>
<td>46</td>
</tr>
<tr>
<td>63</td>
<td>Bolts and nuts</td>
<td>30</td>
<td>64</td>
</tr>
<tr>
<td>64</td>
<td>Iron castings</td>
<td>29</td>
<td>48</td>
</tr>
<tr>
<td>65</td>
<td>Non-ferrous foundries</td>
<td>29</td>
<td>54</td>
</tr>
<tr>
<td>66</td>
<td>Concrete products</td>
<td>28</td>
<td>21</td>
</tr>
<tr>
<td>67</td>
<td>Beverage industries</td>
<td>28</td>
<td>19</td>
</tr>
<tr>
<td>68</td>
<td>Fabricated structural metal</td>
<td>27</td>
<td>56</td>
</tr>
<tr>
<td>69</td>
<td>Meat and dairy products</td>
<td>27</td>
<td>34</td>
</tr>
<tr>
<td>70</td>
<td>Boilers and turbines</td>
<td>24</td>
<td>41</td>
</tr>
<tr>
<td>71</td>
<td>Printing</td>
<td>23</td>
<td>49</td>
</tr>
<tr>
<td>72</td>
<td>Paper containers</td>
<td>23</td>
<td>53</td>
</tr>
<tr>
<td>73</td>
<td>Special industry machinery</td>
<td>22</td>
<td>49</td>
</tr>
<tr>
<td>74</td>
<td>Furniture</td>
<td>16</td>
<td>34</td>
</tr>
<tr>
<td>75</td>
<td>Bakery and confectionery products</td>
<td>12</td>
<td>36</td>
</tr>
</tbody>
</table>

(The writer calculated by the data of 1956 Census of Japanese Manufactures)
chemical fibers, petroleum and cement, which are not listed in the Table for want of data, also belong to this type. They are typical examples of foot-tight type industries.

Type 3. Medium size plants which are market-oriented
Many of them are industries in which medium size plants form the majority. As business enterprises, they are fairly big in scale and show medium regional concentration. This is the type in which several industries are located in their own market centers, dividing the whole domestic market into three or four parts. Drugs and medicines, sugar, and beverage (not in the Table) typify this group.

Type 4. Medium size plants which orient local markets and local raw materials
They are almost similar to Type 3 size and in regional concentration, but one difference is that most of those plants are centered not on general central markets but on dispersed local markets in some cases, or on local raw materials in others.

Type 5. Localized industries
They are formed by the concentration of medium or small industries of the same group. They are dispersed all over the country and are typical examples of cases where location depends largely on external economies. The coefficient of localization ranks middle or high and the actual regional concentration is high as well. Pottery, lacquer ware, woven fabric mills are typical examples.

Type 6. Small plants which orient the central markets
Small and petty industries form the majority and they are concentrated in the Keihin, Hanshin and Chukyo districts. Though the actual regional concentration is rather high, the coefficient of localization ranks middle or low. They fairly resemble in the distribution of the whole industries in general. The names of the groups are given in the Table.

Type 7. Small size plants depending on local raw materials
Most of them are small or petty industries which have a low coefficient of localization. One difference from Type 6 is that they orient local raw materials and some of them orient dispersed local markets as well. Remarkably low concentration in leading prefectures is a characteristic of this type.

These are the distinctive types, which the writer has devised on the basis of the 1956 census, revising Florence's method in consideration of practical conditions in Japan.
IV Comparative study of regional concentration between the 1956 and 1966 data

In order that the picture may be clear, it will be necessary to make a detailed analysis of the industrial scene. Using the minute classification per prefecture given in the “1966 Establishment Census of Japan”, the writer proceeds with the study focusing on the change in these ten years.

But in the 1966 census, twice as many groups are noted, and also several new industries are added due to the rapid development of industrial structures. The writer proceeds with his study on the change during this decade by looking at both the coefficient of localization in 1966 and that of 1956 as shown in Table II.

In this Table, 146 groups of industries are shown according to the relative orders of coefficient of localization in the 1966 census and 75 groups in the 1956 census. The writer classifies them into three ranks and surveys the changes in ranks and orders — for example, the type which changed its rank from top to middle, the type which changed its order which is almost the same as changing the rank, the type which changed its rank from middle to bottom, or the change in the opposite direction, and the slight change in order, etc.

(1) Those which have a slight upward change in rank (from bottom to middle)

<table>
<thead>
<tr>
<th>Type</th>
<th>Order in the coeff. of localization in 1956</th>
<th>Concentration in 3 leading prefectures</th>
<th>Type</th>
</tr>
</thead>
<tbody>
<tr>
<td>7</td>
<td>61 \rightarrow 63</td>
<td>21% \rightarrow 20%</td>
<td>7</td>
</tr>
<tr>
<td>53</td>
<td>53 \rightarrow 85</td>
<td>54% \rightarrow 56%</td>
<td>1</td>
</tr>
<tr>
<td>55</td>
<td>55 \rightarrow 94</td>
<td>42% \rightarrow 43%</td>
<td>1</td>
</tr>
<tr>
<td>70</td>
<td>70 \rightarrow 96</td>
<td>41% \rightarrow 36%</td>
<td>1</td>
</tr>
</tbody>
</table>

(2) Those which show a downward change in rank and order (Type 1)

(a) Downward change in the top rank

<table>
<thead>
<tr>
<th>Type</th>
<th>Order in the coeff. of localization in 1956</th>
<th>Concentration in 3 leading prefectures</th>
<th>Type</th>
</tr>
</thead>
<tbody>
<tr>
<td>7</td>
<td>2 \rightarrow 34</td>
<td>85% \rightarrow 78%</td>
<td>7</td>
</tr>
<tr>
<td>5</td>
<td>5 \rightarrow 24</td>
<td>81% \rightarrow 73%</td>
<td>5</td>
</tr>
<tr>
<td>7</td>
<td>7 \rightarrow 35</td>
<td>84% \rightarrow 62%</td>
<td>7</td>
</tr>
<tr>
<td>1966</td>
<td>1956</td>
<td>Group of Industry</td>
<td>Coefficient of Localization</td>
</tr>
<tr>
<td>------</td>
<td>------</td>
<td>------------------</td>
<td>-----------------------------</td>
</tr>
<tr>
<td>1</td>
<td>1</td>
<td>Cut tobacco</td>
<td>97</td>
</tr>
<tr>
<td>2</td>
<td>2</td>
<td>Small arms</td>
<td>81</td>
</tr>
<tr>
<td>3</td>
<td>3</td>
<td>Cigars</td>
<td>74</td>
</tr>
<tr>
<td>4</td>
<td>4</td>
<td>Leather gloves</td>
<td>72</td>
</tr>
<tr>
<td>5</td>
<td>5</td>
<td>Rubber scrap products</td>
<td>71</td>
</tr>
<tr>
<td>6</td>
<td>6</td>
<td>Pottery</td>
<td>71</td>
</tr>
<tr>
<td>7</td>
<td>7</td>
<td>Pulp mills</td>
<td>66</td>
</tr>
<tr>
<td>8</td>
<td>8</td>
<td>Iron smelting with blast furnaces</td>
<td>64</td>
</tr>
<tr>
<td>9</td>
<td>9</td>
<td>Musical instruments</td>
<td>62</td>
</tr>
<tr>
<td>10</td>
<td>10</td>
<td>Rubber foot wear</td>
<td>62</td>
</tr>
<tr>
<td>11</td>
<td>11</td>
<td>Ophthalmic goods</td>
<td>62</td>
</tr>
<tr>
<td>12</td>
<td>12</td>
<td>Applied electronic equipment</td>
<td>62</td>
</tr>
<tr>
<td>13</td>
<td>13</td>
<td>Chemical fibres</td>
<td>62</td>
</tr>
<tr>
<td>14</td>
<td>14</td>
<td>Physical and chemical instruments</td>
<td>61</td>
</tr>
<tr>
<td>15</td>
<td>15</td>
<td>Lacquer ware</td>
<td>61</td>
</tr>
<tr>
<td>16</td>
<td>16</td>
<td>Publishing</td>
<td>60</td>
</tr>
<tr>
<td>17</td>
<td>17</td>
<td>Reclaimed rubber</td>
<td>60</td>
</tr>
<tr>
<td>18</td>
<td>18</td>
<td>Iron smelting not with blast furnaces</td>
<td>59</td>
</tr>
<tr>
<td>19</td>
<td>19</td>
<td>Clay refractories</td>
<td>58</td>
</tr>
<tr>
<td>20</td>
<td>20</td>
<td>Leather tanning and finishing</td>
<td>57</td>
</tr>
<tr>
<td>21</td>
<td>21</td>
<td>Silk reeling plants</td>
<td>57</td>
</tr>
<tr>
<td>22</td>
<td>22</td>
<td>Electron tubes and semi-conductor devices</td>
<td>57</td>
</tr>
<tr>
<td>23</td>
<td>23</td>
<td>Petroleum refining</td>
<td>56</td>
</tr>
<tr>
<td>24</td>
<td>24</td>
<td>Optical instruments and lenses</td>
<td>56</td>
</tr>
<tr>
<td>25</td>
<td>25</td>
<td>Other textile goods</td>
<td>55</td>
</tr>
<tr>
<td>26</td>
<td>26</td>
<td>Wooden foot wear</td>
<td>55</td>
</tr>
<tr>
<td>27</td>
<td>Industrial leather products materials</td>
<td>54</td>
<td>66</td>
</tr>
<tr>
<td>28</td>
<td>Miscellaneous leather products</td>
<td>54</td>
<td>82</td>
</tr>
<tr>
<td>29</td>
<td>Book-binding and printed matters worked</td>
<td>54</td>
<td>84</td>
</tr>
<tr>
<td>30</td>
<td>Electric measuring instruments</td>
<td>53</td>
<td>67</td>
</tr>
<tr>
<td>31</td>
<td>Aircraft</td>
<td>53</td>
<td>82</td>
</tr>
<tr>
<td>32</td>
<td>Cement</td>
<td>53</td>
<td>49</td>
</tr>
<tr>
<td>33</td>
<td>Other petroleum products</td>
<td>53</td>
<td>67</td>
</tr>
<tr>
<td>34</td>
<td>Surveying instruments</td>
<td>52</td>
<td>78</td>
</tr>
<tr>
<td>35</td>
<td>Watches and clocks</td>
<td>51</td>
<td>62</td>
</tr>
<tr>
<td>36</td>
<td>Fur goods</td>
<td>51</td>
<td>54</td>
</tr>
<tr>
<td>37</td>
<td>Precious metal products</td>
<td>51</td>
<td>61</td>
</tr>
<tr>
<td>38</td>
<td>Coated steel</td>
<td>50</td>
<td>68</td>
</tr>
<tr>
<td>39</td>
<td>Sea food products</td>
<td>49</td>
<td>30</td>
</tr>
<tr>
<td>40</td>
<td>Service industries for printing trade</td>
<td>49</td>
<td>79</td>
</tr>
<tr>
<td>41</td>
<td>Shipbuilding</td>
<td>48</td>
<td>42</td>
</tr>
<tr>
<td>42</td>
<td>Ropes and nettings</td>
<td>48</td>
<td>40</td>
</tr>
<tr>
<td>43</td>
<td>Coal products</td>
<td>48</td>
<td>54</td>
</tr>
<tr>
<td>44</td>
<td>Natural resin and wood chemical products</td>
<td>48</td>
<td>50</td>
</tr>
<tr>
<td>45</td>
<td>Leather foot wear</td>
<td>46</td>
<td>65</td>
</tr>
<tr>
<td>46</td>
<td>Sugar</td>
<td>46</td>
<td>50</td>
</tr>
<tr>
<td>47</td>
<td>Industrial leather products</td>
<td>46</td>
<td>76</td>
</tr>
<tr>
<td>48</td>
<td>Carbon and graphite products</td>
<td>46</td>
<td>34</td>
</tr>
<tr>
<td>49</td>
<td>Primary smelting and refining of non-ferrous metals</td>
<td>45</td>
<td>37</td>
</tr>
<tr>
<td>50</td>
<td>Luggage</td>
<td>45</td>
<td>77</td>
</tr>
<tr>
<td>51</td>
<td>Electric bulbs</td>
<td>45</td>
<td>61</td>
</tr>
<tr>
<td>52</td>
<td>Pens and pencils</td>
<td>44</td>
<td>67</td>
</tr>
<tr>
<td>53</td>
<td>Chemical fertilizers</td>
<td>44</td>
<td>37</td>
</tr>
<tr>
<td>54</td>
<td>Rolling mills, except smelting and steel works</td>
<td>44</td>
<td>65</td>
</tr>
<tr>
<td>55</td>
<td>Woven fabric mills</td>
<td>44</td>
<td>37</td>
</tr>
<tr>
<td>56</td>
<td>Lubricating oils and greases</td>
<td>43</td>
<td>69</td>
</tr>
<tr>
<td>Page</td>
<td>Category</td>
<td>Location 1</td>
<td>Location 2</td>
</tr>
<tr>
<td>------</td>
<td>-----------------------------------------------------------</td>
<td>------------</td>
<td>------------</td>
</tr>
<tr>
<td>57</td>
<td>Miscellaneous non-ferrous metal products</td>
<td></td>
<td></td>
</tr>
<tr>
<td>58</td>
<td>Bicycles, rear cars</td>
<td></td>
<td></td>
</tr>
<tr>
<td>59</td>
<td>Communication equipment</td>
<td></td>
<td></td>
</tr>
<tr>
<td>60</td>
<td>Handbags</td>
<td></td>
<td></td>
</tr>
<tr>
<td>61</td>
<td>Paper mills</td>
<td></td>
<td></td>
</tr>
<tr>
<td>62</td>
<td>Costume related products</td>
<td></td>
<td></td>
</tr>
<tr>
<td>63</td>
<td>Saw mills and planing mills</td>
<td></td>
<td></td>
</tr>
<tr>
<td>64</td>
<td>Yarn and thread mills</td>
<td></td>
<td></td>
</tr>
<tr>
<td>65</td>
<td>Textile machinery</td>
<td></td>
<td></td>
</tr>
<tr>
<td>66</td>
<td>Medical instruments</td>
<td></td>
<td></td>
</tr>
<tr>
<td>67</td>
<td>Cigarettes</td>
<td></td>
<td></td>
</tr>
<tr>
<td>68</td>
<td>Paper products</td>
<td></td>
<td></td>
</tr>
<tr>
<td>69</td>
<td>Dyeing and finishing textiles</td>
<td></td>
<td></td>
</tr>
<tr>
<td>70</td>
<td>Railroad equipment</td>
<td></td>
<td></td>
</tr>
<tr>
<td>71</td>
<td>Canned fruits and vegetables</td>
<td></td>
<td></td>
</tr>
<tr>
<td>72</td>
<td>Motor vehicles</td>
<td></td>
<td></td>
</tr>
<tr>
<td>73</td>
<td>Drugs and medicines</td>
<td></td>
<td></td>
</tr>
<tr>
<td>74</td>
<td>Oils and Paints</td>
<td></td>
<td></td>
</tr>
<tr>
<td>75</td>
<td>Miscellaneous electrical machinery</td>
<td></td>
<td></td>
</tr>
<tr>
<td>76</td>
<td>Tyres and tubes</td>
<td></td>
<td></td>
</tr>
<tr>
<td>77</td>
<td>Reclaiming of waste petroleum oils</td>
<td></td>
<td></td>
</tr>
<tr>
<td>78</td>
<td>Religious furniture</td>
<td></td>
<td></td>
</tr>
<tr>
<td>79</td>
<td>Household electric appliances</td>
<td></td>
<td></td>
</tr>
<tr>
<td>80</td>
<td>Tyre reclaiming plants</td>
<td></td>
<td></td>
</tr>
<tr>
<td>81</td>
<td>Structural clay products</td>
<td></td>
<td></td>
</tr>
<tr>
<td>82</td>
<td>Steel works</td>
<td></td>
<td></td>
</tr>
<tr>
<td>83</td>
<td>Hats</td>
<td></td>
<td></td>
</tr>
<tr>
<td>84</td>
<td>Abrasive products</td>
<td></td>
<td></td>
</tr>
<tr>
<td>85</td>
<td>Electric wire and cable</td>
<td></td>
<td></td>
</tr>
<tr>
<td>86</td>
<td>Rolling of non-ferrous metals</td>
<td></td>
<td></td>
</tr>
<tr>
<td>87</td>
<td>43</td>
<td>Agricultural machinery</td>
<td>36</td>
</tr>
<tr>
<td>88</td>
<td>35</td>
<td>Secondary smelting of non-ferrous metals</td>
<td>35</td>
</tr>
<tr>
<td>89</td>
<td>35</td>
<td>Plywood products</td>
<td>35</td>
</tr>
<tr>
<td>90</td>
<td>42</td>
<td>Glass</td>
<td>35</td>
</tr>
<tr>
<td>91</td>
<td>34</td>
<td>Industrial rubber products</td>
<td>35</td>
</tr>
<tr>
<td>92</td>
<td>34</td>
<td>Office machines</td>
<td>33</td>
</tr>
<tr>
<td>93</td>
<td>33</td>
<td>Table ware and cutlery</td>
<td>33</td>
</tr>
<tr>
<td>94</td>
<td>33</td>
<td>Steel forgings and castings</td>
<td>33</td>
</tr>
<tr>
<td>95</td>
<td>33</td>
<td>Miscellaneous iron and steel</td>
<td>33</td>
</tr>
<tr>
<td>96</td>
<td>33</td>
<td>Boilers and turbines</td>
<td>33</td>
</tr>
<tr>
<td>97</td>
<td>33</td>
<td>Miscellaneous rubber products</td>
<td>33</td>
</tr>
<tr>
<td>98</td>
<td>31</td>
<td>Measuring instruments</td>
<td>31</td>
</tr>
<tr>
<td>99</td>
<td>31</td>
<td>Miscellaneous chemical products</td>
<td>31</td>
</tr>
<tr>
<td>100</td>
<td>31</td>
<td>Fabricated wire products</td>
<td>31</td>
</tr>
<tr>
<td>101</td>
<td>31</td>
<td>Industrial inorganic chemicals</td>
<td>31</td>
</tr>
<tr>
<td>102</td>
<td>31</td>
<td>Miscellaneous apparel</td>
<td>31</td>
</tr>
<tr>
<td>103</td>
<td>31</td>
<td>Newspapers</td>
<td>31</td>
</tr>
<tr>
<td>104</td>
<td>31</td>
<td>Iron castings</td>
<td>30</td>
</tr>
<tr>
<td>105</td>
<td>30</td>
<td>Industrial organic chemicals</td>
<td>30</td>
</tr>
<tr>
<td>106</td>
<td>30</td>
<td>Outwear</td>
<td>30</td>
</tr>
<tr>
<td>107</td>
<td>30</td>
<td>Knitting mills</td>
<td>30</td>
</tr>
<tr>
<td>108</td>
<td>29</td>
<td>Underwear</td>
<td>29</td>
</tr>
<tr>
<td>109</td>
<td>28</td>
<td>Construction and mining machinery</td>
<td>28</td>
</tr>
<tr>
<td>110</td>
<td>28</td>
<td>Miscellaneous metal products</td>
<td>28</td>
</tr>
<tr>
<td>111</td>
<td>28</td>
<td>Heating apparatus</td>
<td>28</td>
</tr>
<tr>
<td>112</td>
<td>28</td>
<td>Concrete products</td>
<td>28</td>
</tr>
<tr>
<td>113</td>
<td>28</td>
<td>Toys and sporting goods</td>
<td>28</td>
</tr>
<tr>
<td>114</td>
<td>28</td>
<td>Miscellaneous textile mills</td>
<td>28</td>
</tr>
<tr>
<td>115</td>
<td>27</td>
<td>Sliding doors</td>
<td>27</td>
</tr>
<tr>
<td>116</td>
<td>27</td>
<td>Beverage industries</td>
<td>27</td>
</tr>
</tbody>
</table>

MINORU BEIKA
| 117 | 60 | Seasonings | 26 | 24 | Tokyo | Chiba | Aichi |
| 118 | 65 | Non-ferrous foundries | 26 | 43 | Tokyo | Osaka | Saitama |
| 119 | 52 | Flour and grain mills products | 26 | 23 | Aichi | Kanagawa | Hyogo |
| 120 |  | Paper products | 26 | 37 | Tokyo | Osaka | Shizuoka |
| 121 | 32 | Animal and vegetable oil and fats | 26 | 37 | Tokyo | Kanagawa | Hyogo |
| 122 | 45 | Paper coating | 25 | 40 | Osaka | Tokyo | Saitama |
| 123 | 34 | Tin cans | 25 | 51 | Tokyo | Osaka | Kanagawa |
| 124 |  | Miscellaneous stone and clay products | 25 | 25 | Tokyo | Aichi | Osaka |
| 125 | 63 | Bolts and nuts | 25 | 59 | Osaka | Tokyo | Ibaragi |
| 126 | 58 | Electrical generating and distributing apparatus | 25 | 52 | Osaka | Tokyo | Aichi |
| 127 | 41 | Metal stamping | 24 | 55 | Tokyo | Osaka | Aichi |
| 128 |  | Miscellaneous transporting equipment | 24 | 46 | Osaka | Tokyo | Aichi |
| 129 |  | Paving materials | 24 | 39 | Tokyo | Kanagawa | Osaka |
| 130 | 62 | Miscellaneous machinery | 24 | 45 | Osaka | Tokyo | Kanagawa |
| 131 | 59 | General industry machinery | 24 | 50 | Tokyo | Osaka | Aichi |
| 132 |  | Miscellaneous food products | 24 | 23 | Shizuoka | Tokyo | Aichi |
| 133 | 71 | Printing | 23 | 52 | Tokyo | Osaka | Aichi |
| 134 |  | Miscellaneous fabricated textile products | 23 | 39 | Osaka | Tokyo | Hyogo |
| 135 | 73 | Special industry machinery | 22 | 48 | Osaka | Tokyo | Aichi |
| 136 |  | Fabricated plastic products | 22 | 48 | Osaka | Osaka | Aichi |
| 137 |  | Miscellaneous industries | 21 | 32 | Tokyo | Osaka | Hyogo |
| 138 | 33 | Metal working machinery | 20 | 44 | Tokyo | Osaka | Aichi |
| 139 |  | Miscellaneous wood products | 20 | 26 | Aichi | Tokyo | Sizuoka |
| 140 | 69 | Metal and dairy products | 19 | 30 | Tokyo | Hokkaido | Osaka |
| 141 |  | Miscellaneous furniture | 19 | 43 | Tokyo | Osaka | Aichi |
| 142 | 74 | Furniture | 19 | 34 | Tokyo | Aichi | Osaka |
| 143 |  | Wooden containers | 18 | 24 | Osaka | Tokyo | Aichi |
| 144 | 68 | Fabricated structural metal products | 18 | 42 | Tokyo | Osaka | Kanagawa |
| 145 | 75 | Bakery and confectionery products | 14 | 30 | Osaka | Osaka | Aichi |
| 146 | 72 | Paper containers | 13 | 44 | Osaka | Osaka | Aichi |

(1966 Establishment Census of Japan)
Electric measuring instruments 10 30 74% → 67%
(b) Downward change from top to middle
Medical instruments 12 66 70% → 57%
Electric bulbs 14 51 79% → 61%
Communication equipment 15 59 78% → 64%
Bicycles, rear cars 18 58 82% → 67%
(c) Downward change in the middle rank
Household electric appliances 28 79 45% → 52%
(d) Downward change from middle to bottom
Heating apparatus 37 111 52% → 54%
Tin cans 34 123 63% → 51%
Metal working machinery 33 138 52% → 44%

(Other types)
(a) Downward change in the top rank or change from top to middle

Ship building 11 41 50% → 42% (Type 2)
Chemical fertilizers 20 53 30% → 37% (Type 2)
Railroad equipment 23 70 50% → 50% (Type 2)
Drugs and medicines 17 73 63% → 60% (Type 3)
Oils and paints 22 74 74% → 67% (Type 3)
Ropes and nettings 16 42 49% → 40% (Type 4)
Paper mills 19 61 39% → 44% (Type 4)
THE CHANGE IN REGIONAL CHARACTERISTICS
OF INDUSTRIES IN JAPAN

Natural resin and wood chemical products

\[ \frac{16}{75} \rightarrow \frac{44}{146} \]
52% → 50% ⑤

Pens and pencils

\[ \frac{13}{75} \rightarrow \frac{52}{146} \]
75% → 67% ⑥

(b) Downward change from middle to bottom

Animal and vegetable fats

\[ \frac{32}{75} \rightarrow \frac{121}{146} \]
36% → 37% ③

Industrial inorganic chemicals

\[ \frac{30}{75} \rightarrow \frac{101}{146} \]
30% → 33% ④

Toys and sporting goods

\[ \frac{38}{75} \rightarrow \frac{113}{146} \]
59% → 45% ⑥

Paper coating

\[ \frac{45}{75} \rightarrow \frac{122}{146} \]
56% → 40% ⑥

Metal stamping

\[ \frac{41}{72} \rightarrow \frac{127}{146} \]
71% → 55% ⑥

(3) Little change in relative orders

In those 72 industries which are comparable, except for 4 industries which showed an upward change and 26 of downward change as stated above, there seems to be little change in the 42 industries left.

As a whole, we can see that a few industries moved upward in order and a considerable number of them moved downward. One characteristic change is that there are some industries which have moved to the top rank mainly by dint of the minute classification in the 1966 census, and some have moved into the top rank owing to the technological development during this decade. The writer will examine the relation between the coefficient of localization and business features by types in the next chapter.

V Change of regional characteristics by types

The writer's concern in this article lies in the field of regional development and industrial location in Japan and particularly the central theme is the change of high concentration of foot-loose type industries in Japan. The writer, therefore, will begin the investigation in this chapter by focusing on Type 1 (foot-loose type) and will then refer to other types.

(1) Change in Type 1 (foot-loose type)

Tentatively the writer assigns 25 industries out of 75 which were in the 1956 census to Type 1. The writer is not quite sure if all 25 fit into this type,
but they seem to have similar tendencies. The change in the 25 industries during this decade, as indicated in the above chapter, can be summarized as follows:

**1. Downward change in the top rank in the coefficient of localization**

- Downward change from the top to the middle rank: 4 industries
- Downward change in the middle rank: 1 industry
- Downward change from the middle to the bottom rank: 3 industries

**2. Upward change from the bottom to the middle rank**

- 2 industries out of 10 in the top rank

**3. Little change in orders**

- 4 industries in the top rank
- 8 industries in the middle rank
- 7 industries in the bottom rank

To summarize the findings, we can recognize several changes, for instance, a considerable number of foot-loose type industries which had relatively high coefficients of localization before have moved downward to the middle rank, and there have been little changes in the industries which were in the middle or bottom ranks, and a few of them have moved upward from the bottom to the middle rank.

We must pay attention to the fact that such industries as applied electronic equipment, physical and chemical instruments, electron tubes and semi-conductor devices which were not seen in the 1956 census and are thought to Type 1, have appeared in the very high orders in the coefficient of localization.

In the more detailed analysis, we come to the conclusion that the same phenomenon as the rapid expansion of population and industries from urban to suburban areas and the relative decrease of them in the central districts as a result can be seen in Type 1, foot-loose type industries as well.

In other words, the conclusion will be that foot-loose type industries in Japan are still maintaining their concentric character, and the urbanization of suburban areas in terms of population and industries is making the concentration more or less low.

**2. Change in Type 2 (foot-tight type)**

In the second type, foot-tight type industries, that is, those which are located both in the central and local districts, out of the three industries which have moved more or less downward in the coefficient of localization, only chemical fertilizer has changed its local condition owing to the technological development during these years and no distinctive change has been seen in others.

That means that the second type industries are still influential in local districts.
(3) Change in other types

Among other types, some leading industries which have moved downward in the coefficient of localization are drugs and medicines, oils and paints, animal and vegetable oils and fats (Type 3), and ropes and nettings, papermills, industrial inorganic chemicals (Type 4).

(a) Type 3 and Type 4

These types in general have shown a considerable trend, but their characteristics in the local condition have changed little within this change.

(b) Type 5 (localized industries)

Type 5, so-called localized industries, has shown little change in the regional concentration. Therefore these industries are still maintaining relatively high regional concentration. Rather, by dint of minute classification in 1966, more industries are picked up distinctly as localized industries, and also many of them rank in the top group. We can assume that this trend is the only result of the fact that the industries which originally had high regional concentration, have classified their characteristics owing to the minute classification in 1966.

(c) Type 6 and Type 7

Type 6 and Type 7 industries in which middle, small and petty industries form the majority, have changed little, except a few of them, as most of them originally occupied low orders in the coefficient of localization.

VI Characteristic changes in the decade

The scale of Japanese industrial activities taken up here through ten years from 1956 to 1966 grew nearly four times as large in production and shipment, and the number of industrial workers on which this article is based almost doubled. The extent of concentration of the workers to the main prefectures shows such a change as indicated in the following table.

Table 3. Change of percentage in 5 prefectures

<table>
<thead>
<tr>
<th>No. of workers</th>
<th>1956</th>
<th>1966</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Total of all prefectures</strong></td>
<td>5,506,000</td>
<td>11,336,000</td>
</tr>
<tr>
<td>Tokyo</td>
<td>15.0%</td>
<td>16.3%</td>
</tr>
<tr>
<td>Kanagawa</td>
<td>4.7</td>
<td>6.0</td>
</tr>
<tr>
<td>Aichi</td>
<td>9.4</td>
<td>8.5</td>
</tr>
<tr>
<td>Osaka</td>
<td>11.5</td>
<td>11.0</td>
</tr>
<tr>
<td>Hyogo</td>
<td>6.1</td>
<td>5.3</td>
</tr>
<tr>
<td><strong>Total</strong></td>
<td>46.7</td>
<td>47.1</td>
</tr>
</tbody>
</table>

(“Census of Manufactures, 1956” and “1966 Establishment Census of Japan”)
(Source) "Census of Manufactures, 1956" and "1966 Establishment Census of Japan"

Thus we have examined the features of regional concentration according to the enlargement of the Japanese industrial scale.

Now we can summarize the characteristic changes as follows:

(1) A considerable number of changes has occurred in order in the top and middle ranks.

(2) New type industries which occupied heavy positions in the 1966 census, such as electronic industries of the foot-loose type (Type 1) and chemical products of the foot-tight type (Type 2), so-called growing industries, rank relatively high in the coefficient of localization. Type 1 new industries out of them are located mainly in the central industrial districts and Type 2 new industries are located both in the central and local districts. Their typical characteristics have shown little change compared with before.

(3) In contrast with them, quite a lot of Type 1 and Type 2 industries taken up in the 1956 census have moved downward in order in the coefficient of localization. Type 1 has shown fairly wide permeant development in the central industrial districts especially in and around the suburbs of the capital. Type 2 industries, with a few exceptions, have moved a little lower in the coefficient of localization without showing any distinctive change in characteristics.

(4) There seems to have been little change in other types in this decade in local characteristics.

So far we have surveyed the characteristic changes in industrial location in this decade. Today when the regional development policy is under re-examination, it is necessary to proceed with our consideration on the basis of understanding the features of industrial location as a propelling power of regional development. From the public stand point of policy-maker, one should consider well, once at least, the logic of the actual situations of industrial locations, and from the stand point of private business, one also should examine to a large extent what sort of relation will be made between the present trend of location being formed by private business itself and the future regional problems our country will necessarily face.
FUNCTIONS OF SCREEN ACCOUNTS

Nobuko Nosé

1. Introduction

In the early 1960's the advantages claimed for the screen account, originated in the French national accounting system were known only by a few social accountants. After that it has come to be felt that a new grand design for integrating many branches of social accounts should be introduced and the traditional system of national accounting such as SNA has to be substituted for the system of accounts based on the grand design. It is also felt that a new type of account for recording transaction in detail and for rerouting the transaction flow from one branch to another is required as a key device in the new system. The interest in the screen account has been growing and its applications have been tried by leading social accountants.

In this article we intend to analyse the specific functions of the screen account with aids of matrix notation and of account forms proper.

2. The Characters and Functions of the Screen Account

There are three basic characters of the screen account which has been utilized by the French system:

i. The screen account, an account for transaction categories, i.e. commodity, factor service and transfer, is linked with the transactor account. Every transaction is recorded first in the screen account as a sub-account of the transactor account and we are able to read the operation in detail of any transactor in the accounting period, otherwise we can not have any information in detail.

ii. In any system with screen accounts, direct relationships between sectors are broken down because the screen account is set between transactor accounts as a screen in the system and the transaction flows between transactor accounts (or sector accounts) can be closed only via screen accounts as shown in table 1.

The first quadrant of table 1 where rows and columns of screen accounts intersect together is as empty as the fourth quadrant where rows and columns of transactor accounts intersect, while it is remarkable that transaction flows are

Table 1. The transaction flows in the system with transactor accounts and screen accounts

<table>
<thead>
<tr>
<th>dr</th>
<th>Commodity 1</th>
<th>Commodity 2</th>
<th>Sector 1</th>
<th>Sector 2</th>
<th>Resources transacted</th>
</tr>
</thead>
<tbody>
<tr>
<td>cr</td>
<td></td>
<td></td>
<td>t(_l1)</td>
<td>t(_l2)</td>
<td>t(_l)</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>t(_s1)</td>
<td>t(_s2)</td>
<td>t(_s)</td>
</tr>
<tr>
<td>Commodity 1</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Commodity 2</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Sector 1</td>
<td>t(_l-1)</td>
<td>t(_s-1)</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Sector 2</td>
<td>t(_l-2)</td>
<td>t(_s-2)</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Use of resources</td>
<td>t(_l')</td>
<td>t(_s')</td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

Table 2. The macro-accounting system with screen accounts

<table>
<thead>
<tr>
<th>dr</th>
<th>Screen account</th>
<th>Production a/c</th>
<th>Income a/c</th>
<th>Capital a/c</th>
<th>Consolidated a/c</th>
<th>R.O. W.</th>
<th>Total</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Screen account</td>
<td>Sector 1</td>
<td>Sector 2</td>
<td>Sector 1</td>
<td>Sector 2</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>Goods &amp; services</td>
<td>52</td>
<td>15</td>
<td>168</td>
<td>4</td>
<td>49</td>
<td>329</td>
</tr>
<tr>
<td></td>
<td>Factor services</td>
<td>202</td>
<td>31</td>
<td>9</td>
<td></td>
<td></td>
<td>242</td>
</tr>
<tr>
<td></td>
<td>Transfer</td>
<td>15</td>
<td>9</td>
<td>24</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>Claim</td>
<td>1</td>
<td>3</td>
<td>4</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>Total</td>
<td>329</td>
<td>242</td>
<td>24</td>
<td>4</td>
<td>254</td>
<td>256</td>
</tr>
</tbody>
</table>

concentrated on the second quadrant and the third quadrant respectively.

iii The accounting system with screen accounts can be extended and elaborated for analyzing an economy as a whole. This system is written in a matrix form as is shown in table 2.

The functions of the screen account, derived from these characters above mentioned are as follows:
A. Function of serving as a means of showing transaction structure by transaction categories.

There are some convenient ways which are applicable to show the transaction flow in detail when we are not contented with aggregative information available from aggregative systems of accounts like OEEC/UN system and when we wish to get more disaggregative information of the transaction structure for building the disaggregative model. They are i to deconsolidate of sector accounts, ii to show individual items in supplementary tables of aggregative accounts, iii to adopt the semi-articulated system, and iv to adopt the system with screen accounts. The last one (iv) is a more operational and consistent method than the others because they have more demerits, that is, the adoption of i, which is the best method from the theoretical point of view, is difficult and infeasible from the statistical point of view because by deconsolidation of sector accounts the cells in the matrix concerned increase enormously in numbers and accordingly the informations to give contents in the cells required also grow larger in numbers; ways ii and iii are more feasible than i, but they have another obstacle, that is, we fail to observe constituent transactions in the state of response of entries of them and their counter-entries because the individual items of transaction are not connected with its counterpart but are connected only with the aggregates in these systems. This is a common demerit of the systems of ii and iii. The system with screen accounts has greater virtue than all the others as it can provide disaggregative informations by transaction categories which are recorded on the screen accounts as sub-accounts of the transactor account. In this system it is not necessary to deconsolidate transactor accounts further. Instead of doing this, screen accounts are built in the system to show transactors' operations by transaction categories. The transaction flow is able to be analyzed in double view — aggregative and disaggregative, and the network of the transaction flow in an economy can be maintained without loose ends because both accounts — transactor accounts and screen accounts — are linked together and any transactor account is linked with each other through screen accounts.

The system with screen accounts is, therefore, a comprehensive system for excluding obstacles in observing the constituent elements in the transaction flow without loose ends. This function of screen accounts was discovered and has been utilized by the French system.

B. Function of serving as an operational system for articulating the transaction flow. To get a fully articulated system where all transaction flows are recorded on 'to whom from whom' basis, is beyond our present statistical ability, because on the part of the payable flow it is difficult to ascertain the sector of destination
and on the part of the receivable flow it is also difficult to do the sector of origin. For this reason we must abandon the ideal way and are obliged to take a more operational way as a substitute. As the operational way we have alternative system: the semi-articulated system and the system with screen accounts. The former is limited because it can articulate only the aggregates of transaction flow but it fails to articulate the constituent elements of the aggregates in the system. On the contrary, in the system with screen accounts, the whole transaction flow — not only the aggregative flow but also the elements of the transaction flow in detail — can be closed because the screen accounts serve as record keepers for the items of the transaction flow which can not find their counter-entry within the system. The screen account performs this function as if in the market where every transaction flow from the sectors of origin and of destination is met and the ex post equality of supply and demand is attainable in either case where the entry or its counter-entry is identifiable or not in the numerous transactor accounts. Moreover, from the record of market one can estimate the amounts of the transaction flows that came to the market.

The screen account is, called 'market account', by its attribute of market proper i.e. intermediating sectors of origin to sectors of destination and keeping records of transactions.

Transaction flow, composed of individual transactions as constituent elements are thus able to be closed by this accounting device even when entries of transactions in one transactor account cannot find the counter-entries in another, that is, even when there are many loose ends in the system. This function was discovered by Dr. Stuvel.

C. Function of serving as a substitute for disaggregating the sector account.

This function, derived as a corollary from the above A and B, has double merits: i the function of serving for elaborating and decomposing the transaction flow of the transactor instead of deconsolidating the sector account, and ii the function to serving for disaggregating the aggregates into separate accounts according to the many operations performed by a transactor in the accounting period.

As for ii the screen account is serving in the French system where the business sector is limited not on the establishment basis but on the institutional basis. And in SAM for the Cambridge model, they combined the screen accounts and the industry accounts instead of decomposing industries by the commodities which they produce. The screen account of the commodity is called commodity account, and we shall specify it in later.

As for ii, it serves for the system in which the transactors' operations are
various and are required to be analyzed by number of transaction categories. The typical example is the system of flow of funds accounts where it is required to represent the flow of funds from the viewpoint of the ‘who owes what to whom’ basis. In the system of flow of funds analysts intend to observe the transaction flow by three dimensions, i.e. transactor, his counterpart, and the categories of financial claims which ascertain the transactors’ portfolio selection. Hence, the screen accounts are applicable as useful accounting devices in this flow of funds accounting and we shall refer to this problem later it again.

D. Function of serving as a channel of many macro-accounting systems.

i. Functions of classifying and converting the transaction flow in the input-output accounting.

They are the main functions of the commodity account.

Table 3. Commodity flow in the system with dual classification of production account

<table>
<thead>
<tr>
<th>dr</th>
<th>commodity 1</th>
<th>commodity 2</th>
<th>industry 1</th>
<th>industry 2</th>
<th>institutional sectors</th>
<th>the other all accounts consolidated</th>
<th>total</th>
</tr>
</thead>
<tbody>
<tr>
<td>cr</td>
<td>T_{11}</td>
<td>T_{12}</td>
<td>T_{13}</td>
<td>T_{21}</td>
<td>T_{22}</td>
<td>T_{1c1}</td>
<td>T_{1R1}</td>
</tr>
<tr>
<td>commodity 1</td>
<td>T_{11}</td>
<td>T_{12}</td>
<td>T_{13}</td>
<td>T_{21}</td>
<td>T_{22}</td>
<td>T_{1c1}</td>
<td>T_{1R1}</td>
</tr>
<tr>
<td>commodity 2</td>
<td>T_{21}</td>
<td>T_{22}</td>
<td>T_{3}</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>industry 1</td>
<td>T_{11}</td>
<td>T_{12}</td>
<td>T_{13}</td>
<td>T_{21}</td>
<td>T_{22}</td>
<td>T_{1c1}</td>
<td>T_{1R1}</td>
</tr>
<tr>
<td>industry 2</td>
<td>T_{21}</td>
<td>T_{22}</td>
<td>T_{3}</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>institutional sectors</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td>T_{CR}</td>
</tr>
<tr>
<td>the other all accounts consolidated</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td>T_{R1}</td>
</tr>
<tr>
<td></td>
<td>T_{R2}</td>
<td>T_{RC}</td>
<td>T_{RR}</td>
<td></td>
<td></td>
<td></td>
<td>t_{R}</td>
</tr>
<tr>
<td>total</td>
<td>t_{1}</td>
<td>t_{2}</td>
<td>t_{1}</td>
<td>t_{2}</td>
<td>t_{c}</td>
<td>t_{R}</td>
<td>t_{R}</td>
</tr>
</tbody>
</table>

As for the classifying function, we will get table 3 first, of production accounts into the commodity accounts and the industry accounts, by deconsolidating. The four entries \( \left( T_{11}^{1}, T_{12}^{2} \right) \) in the upper middle in the table, are elements of \( T^{1.2} \) of the symbolic SAM i.e. Absorption Matrix and the four entries \( \left( T_{11}^{1}, T_{12}^{2} \right) \) in the left hand side in the table, are elements of \( T^{2.1} \) i.e. Make Matrix \( T \) shows a group of commodities and \( T \) shows a group of products produced in industries respectively.

The products of one industry are not homogeneous because the products

\( (2) \) G. Stuvel, Systems of Social Accounts, ibid.
of any establishment which is an accounting unit of an industry in input-output accounting are composed not only of its principal product but also subsidiary products which should be classified as principal products of the other industries.

The usefulness of table 3 is as follows: it works as servicable to be an acid test by which one can examine whether an industry's input-output coefficients are more reliable than commodity-input-output coefficients, that is to say, whether the assumption of industry technology should be favored or the assumption of commodity technology should be. This is because the table shows that there is one to one correspondence between the products of industries and the commodities if and when the elements of $T_{21}^1$ and $T_{12}^3$, the elements which exist away from the leading diagonal of $T^{2,1}$, are almost all zero but that there is no one to one correspondence between then if and where the elements are considerably big, that is, when the share of any commodity spreads over industries. As it will be easily understood, the former case is fit for the industry technology assumption while the latter is for the commodity technology assumption. In the latter case, $T^{1,2}$ i.e. \( \begin{pmatrix} T_{12}^1 & T_{12}^1 \\ T_{21}^2 & T_{22}^2 \end{pmatrix} \) is required for estimating exact input-output coefficients matrix.

Thus the commodity account is a useful accounting device for analyzing the input-output structure of economy and for showing commodity flow from the industry, where commodities are actually produced either as principal products or as subsidiary ones, to the sector of destination where the commodities are actually utilized.

As for the converting function of the commodity account, it serves for the system integrated by the input-output accounts and the other social accounts. The transaction flows of commodities on the input-output tables are classified by industry i.e. on industry basis. It should be remarked that the same transaction flows are classified according to the government purposes when they are recorded in the government account, but that they are classified according to the order of the private consumers' purposes like a consumer's shopping list when they are recorded in the private consumers' account. There is no one to one correspondence between the items classified in the production accounts of industries and the items of the expenditure classified in the accounts of general government or of the account of consumer's sector. Then is required, a common accounting device for connecting the same transactions classified on different basis with each other and the commodity account is called to serve for this purpose. By using the commodity account as a common sub-account of many systems with multiple classifications, the flows of government expenditure and of private consumers' consumption classified on their respective basis are reclassi-
FUNCTIONS OF SCREEN ACCOUNTS

Table 4. Conversion of the government expenditure into the commodity groups.

4 A Government income and outlay a/c

<table>
<thead>
<tr>
<th>Defence</th>
<th>1,611</th>
<th>Income</th>
<th>4,189</th>
</tr>
</thead>
<tbody>
<tr>
<td>Health, education &amp; child care</td>
<td>1,548</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Other</td>
<td>1,030</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

4 B Government expenditure reclassified by commodities and other

<table>
<thead>
<tr>
<th>Screen accounts</th>
<th>Defence</th>
<th>Health, education, child care</th>
<th>Other</th>
</tr>
</thead>
<tbody>
<tr>
<td>Commodity 1</td>
<td>74</td>
<td>46</td>
<td>41</td>
</tr>
<tr>
<td>Commodity 2</td>
<td>637</td>
<td>62</td>
<td>98</td>
</tr>
<tr>
<td>Commodity 3</td>
<td>28</td>
<td>147</td>
<td>39</td>
</tr>
<tr>
<td>Commodity 4</td>
<td>23</td>
<td>266</td>
<td>67</td>
</tr>
<tr>
<td>Net indirect tax</td>
<td>10</td>
<td>20</td>
<td>14</td>
</tr>
<tr>
<td>The other all accounts consolidated</td>
<td>839</td>
<td>1,007</td>
<td>771</td>
</tr>
<tr>
<td>Total</td>
<td>1,611</td>
<td>1,548</td>
<td>1,030</td>
</tr>
</tbody>
</table>

4 C Classification converter matrix (government expenditure)

<table>
<thead>
<tr>
<th>Screen accounts</th>
<th>Defence</th>
<th>Health, education, child care</th>
<th>Other</th>
</tr>
</thead>
<tbody>
<tr>
<td>Commodity 1</td>
<td>0.05</td>
<td>0.03</td>
<td>0.04</td>
</tr>
<tr>
<td>Commodity 2</td>
<td>0.40</td>
<td>0.04</td>
<td>0.10</td>
</tr>
<tr>
<td>Commodity 3</td>
<td>0.02</td>
<td>0.09</td>
<td>0.04</td>
</tr>
<tr>
<td>Commodity 4</td>
<td>0.01</td>
<td>0.17</td>
<td>0.07</td>
</tr>
<tr>
<td>Net indirect tax</td>
<td>0.01</td>
<td>0.01</td>
<td>0.01</td>
</tr>
<tr>
<td>The other all accounts consolidated</td>
<td>0.52</td>
<td>0.65</td>
<td>0.75</td>
</tr>
</tbody>
</table>

fied and converted into the categories on the industry basis by every item as table 4 and 5 show respectively.

Table 4A shows the government expenditure classified for government purposes and table 4B shows the account resulting from the conversion of 4A into commodity account on the industry basis. Only after routing through the commodity account, it is possible to estimate the exact effect of the expenditure flow of the government on the industries. And table 4C, the matrix of classification converters derived from tables 4A and 4B can be applicable to reclassify the government expenditure. As the coefficients in table 4C are stable in the
short run, by using this classification converter matrix, we can immediately get the government's final demand on commodity classified on the industry basis. Table 5 also shows the reclassification of consumers' expenditure into the demand for the product on industry basis. This is the table for showing the conversion of the private consumption flow based on the consumer's shopping list into the commodities classified on the industry basis.

This function of classification and conversion is found by Prof. Stone and his followers in 'Social Accounting Matrix' i.e. SAM(3) and is used again in

(3) Cambridge, Department of Applied Economics. A Social Accounting Matrix for
'Proposals for revision of the SNA'.\(^{(4)}\) ii. Functions of connecting the real account with the financial account and of connecting the system of flow accounts with balance sheet.

These functions of screen account are specified as those of so-called dummy account.

As for the first function, the dummy account serves to integrate the two types of sub-account of the capital account i.e. the capital expenditure account as a real account and the capital financing account as a financial account. To explain this, let us take the inventory formation as a kind of investment. The inventory formation is a transaction between commodity account i.e. the account of fuels and low materials and capital expenditure account and is recorded on the cells where the row of the commodity account concerned intersects the column of capital expenditure account. Then, the record of the finance for this inventory formation, shown in the capital financing account, does not give any information as to how that purchase for inventory formation by the industry is financed, because there is no one to one correspondence between the elements of industry's capital expenditure account classified on the industry basis and those of business sector's capital financing account classified on the institutional basis. Therefore in order to integrate the two types of sub-accounts based on the different criterion, it is required to have the dummy account which links them up. The items of capital expenditure, i.e. inventory formation and fixed asset formation, are put into the credit side of the dummy account as uses of funds, and the items of the financing flow, i.e. saving, borrowing from the other sectors, and depreciation, are put into as sources of funds.

The dummy account is also used to give a link between value added, a sub-account of the production account recorded on the industry basis, and factor incomes as sub-accounts of income and outlay account of the institutional sector.

As for the second function, the dummy account is introduced for connecting the capital expenditure account with the sector balance sheet. The sector balance sheet is, in the present state, provided only with one type i.e. balance sheet on the institutional basis. It is easy and straight forward to integrate the capital financing account and the sector balance sheet because both of them are on a common institutional basis and there is a definitional relationship which

---


we denote as $A_1 = A_0 + \Delta F + R$ and $L_1 = L_0 + \Delta F + R$ (where $A$, $\Delta F$, $R$, and $L$ are asset, increment of asset, item of revaluation, and liability respectively and subscripts 0 and 1 denote the beginning of the accounting period and the end of the period respectively). On the other hand, in order to connect the capital expenditure account with the sector balance sheet, it is necessary first to take a more roundabout way of rerouting the flow of real capital formation into that of capital financing account through the dummy account as above mentioned and then to sum the amount of capital financing, the amount of revaluation, and the amount of capital in the opening sector balance sheet to get the closing sector balance sheet.

The dummy account, which converts the elements of the capital expenditure account classified on the activity basis into the elements of the capital financing account classified on the institutional basis, has a pure property of the screen account. By this dummy account, two different types of accounting system, namely, sub-accounts of the capital account and the systems of flow account and stock account (sector balance sheet) are integrated at every transaction categories.

3. Screen Account in Present and in Future

It is in the Social Accounting Matrix that the screen account has been built to arrange the transaction flow to fit a disaggregative model i.e. the Cambridge model which is composed of various elements such as input-output matrix, capital matrix, consumption function, Cob-Dougous function, and the required rate of growth. The model being far from simple and static macro-model, the informations available from traditional systems of macro-accounts i.e. Blue Book and Yellow Book (The 1954 input-output tables for the United Kingdom) were not suitable and so a new elaborated system of accounts with screen accounts i.e. SAM was introduced.

SAM is a big step toward a comprehensive and integral system of social accounts. After this experience, the ‘proposals for revision of SNA’ demonstrated a revolutionary system based on the grand design attained the integration of the systems of social accounts and was fit for disaggregative model. In the system, the screen account was used again as a key accounting device. The wider use of the screen account is obviously due to its virtue — its various functions as has been explained.

The screen account in future use. The screen account tends to be adopted wider in social accounting system. There are some reasons to support our assumption: Firstly, there is a tendency to deconsolidate the type of real
account and that type of the financial account move on their basis respectively. On the other hand, it is also aimed to integrate the two types of account deconsolidated or to give a knot for real-financial dichotomy from a viewpoint of a synthestic dimension. For example we wish to have a statement of capital goods classified by age of capital goods, kind of capital goods and by industry as a user of them, and on the other hand we wish to have a balance sheet classified by size of capital, type of organization of business and the region where the business is located. And we also wish to have a general integrated balance sheet out of two different types of balance sheets i.e. the balance sheets on the industry basis and on the institutional basis. Thus the screen account is required to provide an indispensable channel between the two accounting systems on different basis.

Secondly, the proper nature of screen account for showing the operation of transactor in detail is still useful and this function should be applied wider than now. This is true especially in financial accounting. The financial activity which any institutional sector performs is observable only in the screen account of claim where the financial transactions are recorded by kinds of claim classified by different degree of liquidity and date of maturity, etc. Obviously it is an important merit of the screen account of claim to serve for analyzing how the sector selects his portfolio from among many financial objects and then to serve for getting the matrix of financial expenditure coefficients. The form of accounts which is used by financial accountants is a traditional form of financial accounts. But it can be expected that the present form of accounts will tend to change for a more concise system in matrix form and the system with screen accounts for getting better information.

From all of these considerations we conclude that the screen account is applicable the most useful weapon in many realms of social accounting systems.

References

4. Cambridge, Department of Applied Economics. Input-Output Rela-


ON MR. STOLERU’S OPTIMAL POLICY FOR ECONOMIC GROWTH

Hikoji Katano

Introduction

1. Mr. Stoleru [1] has dealt with the problem of optimal investment allocation between capital goods and consumer goods industries in a developing country. Using a new mathematical method (Pontryagin’s Maximum Principle), he has achieved the definition of an optimal investment policy.

The purpose of his study is to determine the best way to allocate investment in a developing country where there is severe unemployment. In this case, he means to make precise the words “best way” by specifying the following two goals: (1) to reach full employment as soon as possible in such a way that balanced growth is possible afterward, and (2) to produce a maximum total discounted amount of consumer goods.

The method of his study is to build a simple two sector model with a capital goods sector and a consumer goods sector, in both of which a fixed coefficient of production prevails. Then the optimal investment allocation between the two sectors is obtained by using the Pontryagin’s Maximum Principle. The general conclusion is to invest in the capital goods sector at the highest rate during the first phase, and then to shift all investment to the consumer goods sector in the second phase. Finally, the economy expands along the balanced growth path (von Newmann path) during the last stage.

We consider this general conclusion to be the completed version of Mahalanobis [4] — Domar [2] — Dobb [1]’s economic growth theory of developing countries. These economists have suggested only the investment allocation pattern in the first stage mentioned above.

2. In this paper, we examine Mr. Stoleru’s employment problem: to reach full employment as soon as possible in such a way that balanced growth is pos-

(1) Cf. L. S. Pontryagin et al. [5].
(2) As a refinement of this criteria, Mr. Stoleru adds the constraint that a minimum level of per capita consumption is fixed each year.
(3) M. Dobb has touched the investment allocation pattern in the second stage. But his consideration is not concerned with the balanced growth path after full employment is achieved.
sible afterward. Our findings are the followings:

1. Full employment cannot always be achieved within a minimum time horizon under the condition that balanced growth is possible afterward.
2. To reach full employment within a minimum time horizon, appropriate technical choice is needed.

Mr. Stoleru's Growth Model.

3. Mr. Stoleru's growth model is composed of the following relations.

A. Labour Supply: Total labour supply $L(t)$ grows at a constant rate $n$ at the same time the total population grows.

\[ L(t) = L(0) e^{nt} \]

B. Production Function: The growth model is composed of two sectors, one producing capital goods and the other producing consumer goods. We define the following notations:

- Capital Goods Sector
  - Output: $X_1$
  - Capital: $K_1$
  - Employment: $N_1$
  - Capital-Output ratio: $1/\beta_1$
  - Labour-Capital ratio: $\alpha_1$

- Consumer Goods Sector
  - Output: $X_2$
  - Capital: $K_2$
  - Employment: $N_2$
  - Capital-Output ratio: $1/\beta_2$
  - Labour-Capital ratio: $\alpha_2$

Then we have the following production functions:

\[ X_1 = \beta_1 K_1, \quad X_2 = \beta_2 K_2 \]
\[ N_1 = \alpha_1 K_1, \quad N_2 = \alpha_2 K_2 \]

C. Investment: There is no foreign aid, no lag between production of capital goods and investment, no possible shift of existing capital from one sector to the other, no depreciation prevailing in both sectors.\(^{(4)}\) Using the general notations $\dot{x} = dx/dt$, we have the equations of capital accumulation:

\[ \dot{X}_1 = \dot{K}_1 + \dot{K}_2 \]
\[ \dot{X}_2 = \dot{K}_2 \geq 0 \]
\[ \dot{K}_1 \geq 0 \]
\[ \dot{K}_2 \geq 0 \]

D. Allocation of Investment: We now introduce a control variable $u(t)$ defined

---

\(^{(4)}\) In the original paper of Mr. Stoleru, depreciation in both sectors have been considered. But, in this paper, we neglect depreciation for the sake of simplicity.
as a ratio of gross investment in the capital goods sector to total gross investment,

\[
(5) \quad u = \frac{\dot{K}_1}{\dot{K}_1 + \dot{K}_2}
\]

E. Balanced Growth: With the above definitions, we have

\[
(6) \quad \begin{align*}
\dot{K}_1 &= u \beta_1 K_1 \\
\dot{K}_2 &= (1-u) \beta_1 K_1
\end{align*}
\]

for \(0 \leq u \leq 1\).

Let us suppose that full employment is achieved after some time \(T\). This can be written as

\[
(7) \quad \alpha_1 K_1 + \alpha_2 K_2 = L(0) e^{ut}
\]

for \(t \geq T\). So that we have

\[
(8) \quad \dot{K}_1 + \dot{K}_2 = \beta_1 K_1 \\
\alpha_1 K_1 + \alpha_2 K_2 = L(0) e^{ut}
\]

for \(t \geq T\).

This system has the solution

\[
(9) \quad \begin{align*}
K_1(t) &= Ae^{ut} + e^{(t-T)}[K_1(T) - Ae^{rt}] \\
K_2(t) &= Be^{ut} + e^{(t-T)}[K_2(T) - Be^{rt}]
\end{align*}
\]

for \(t \geq T\), where

\[
\begin{align*}
A &= \frac{nL(0)}{(\beta_2 - n)\alpha_2 + n\alpha_1} \\
B &= \frac{(\beta_1 - n)L(0)}{(\beta_1 - n)\alpha_2 + n\alpha_1} \\
C &= \frac{\beta_1 \alpha_2}{\alpha_2 - \alpha_1}
\end{align*}
\]

A balanced growth is possible only for the specified values of \(K_1(T)\) and \(K_2(T)\). The balanced growth path, known as the von Neumann maximal steady growth path, is obtained when

\[
(10) \quad \begin{align*}
K_1(T) &= Ae^{rt} \\
K_2(T) &= Be^{rt}
\end{align*}
\]

and the economy is then expanding at the rate of the growth of population.

After all, Mr. Stoleru restricts his study to the path which reaches the von Neumann path at some time \(T\) and then follows it. Therefore, the growth model becomes as follows:
1) Before full employment \((t \leq T)\),

(i) equations

\[
\dot{K}_1 = u\beta_1 K_1 \\
\dot{K}_2 = (1-u)\beta_1 K_1
\]

where \(K_1(0)\) and \(K_2(0)\) are given,

(ii) conditions on the control variable

\(0 \leq u(t) \leq 1\),

(iii) path condition

\[
\alpha_1 K_1 + \alpha_2 K_2 < L(0)e^u \quad \text{for} \quad t < T
\]

(iv) terminal conditions

\[
K_1(T) = A e^{\sigma T} \\
K_2(T) = B e^{\sigma T}
\]

2) After full employment \((t \geq T)\)

\[
K_1(t) = A e^{\sigma t} \\
K_2(t) = B e^{\sigma t}
\]

Then Mr. Stoleru's employment problem is to find the policy \(u(t)\) which minimizes \(T\).

**Mr. Stoleru's Optimal Policy.**

4. The employment problem can be solved by using the Pontryagin's Maximum Principle. The solution is

\[
u(t) = \begin{cases} 1 & \quad 0 \leq t \leq \tau \\ 0 & \quad \tau < t \leq T \end{cases}
\]

where \(\tau\) and \(T\) are determined by the system

\[
K_1(T) = K_1(0)e^{\delta \tau} = A e^{\sigma T} \\
K_2(T) = K_2(0) + K_1(0)e^{\delta (T-\tau)} = B e^{\sigma T}.
\]

Thus the optimal investment policy will be to concentrate all investment to the capital goods sector in the first stage \((0 \leq t \leq \tau)\), and then to shift all investment to the consumer goods sector in the second stage \((\tau < t \leq T)\). And finally, the economy expands along the balanced growth path during the last stage \((t > T)\).
Growth Frontier

5. Taking the optimal investment policy (11), we can find a growth frontier at time $T$. The growth frontier is reduced from (11) by eliminating the turning time point $\tau$.

$$\frac{K_2(T) - K_2(0)}{K_1(T)} = T - \log \frac{K_1(T)}{K_1(0)}$$

$$K_1(T) \geq K_1(0)$$
$$K_2(T) \geq K_2(0)$$

This frontier has characteristics to be a concave to the point $S[K_1(0), K_2(0)]$, and to extend in itself at a certain rate toward the north-east direction.

6. Mr. Stoleru's full employment situation is located at the point $F[K_1(T), K_2(T)]$ on Figure 1. This situation $[K_1(T), K_2(T), T]$ is determined by the system (10) and (13). Tangent of the straight line $OF$ is $(\beta_1 - n)/n$. Mr. Stoleru’s optimal growth path is then illustrated by $S \rightarrow R \rightarrow F \rightarrow E$ on Figure 1.

![Figure 1](image)

Full Employment Level

7. By neglecting the condition that balanced growth is possible after full
employment is achieved, we can have a full employment situation which is attained within a minimum time horizon under the given condition. The full employment situation is expressed by the relation (7). We call this relation the full employment level, which expands at a certain rate toward the north-east direction. The full employment within a minimum time horizon is attained at the point whose the growth frontier touches the full employment level. To reach the full employment situation within a minimum time horizon, the rate to expand the growth frontier must be larger than the rate to expand the full employment level. Otherwise, the growth frontier can not come up to the full employment level. Thus the condition that makes it possible to reach full employment within a minimum time horizon is written as

\[
K_2(T) - K_2(0) = \frac{1 - \alpha_1}{\alpha_2} K_1(T)
\]

Then the full employment situation within a minimum time horizon \([K_1(T*), K_2(T*), T*]\) is determined by the system (7), (13) and (14).

Balanced growth or Full Employment within a Minimum Time

8. Let us illustrate the full employment situation within a minimum time horizon by the point \(F\) on Figure 1. Point \(F\) does not always identify point \(F*\). And when the point \(F\) is different from the point \(F*\), time \(T*\) is necessarily less than \(T\). This is verified by the fact that the growth frontier touches the full employment level at the point \(F*\) but the former crosses the latter at the point \(F\).

9. When full employment is attained at the point \(F*\), a balanced growth can not be expected afterward. Therefore, the growth path that leads to the point \(F*\) is not optimal. Thus it is clear that balanced growth contradicts the term of full employment within a minimum time horizon.

Optimal Choice of Technique

10. In the next stage, we have to consider the optimal choice of technique. If we can expect full employment within a minimum time horizon \(T**\) that is less than \(T*\) after any appropriate choice of technique, we call it the optimal choice of technique.

Eliminating \(K_1(T)\) and \(K_2(T)\) in the system (7), (13) and (14), we have
(15) \( L(0)e^{\alpha_T} = \alpha_2 K_2(0) + \alpha_2 K_1(0)e^{\theta_T - \left(1 - \frac{\alpha_1}{\alpha_2}\right)} \).

So that we have

(16) \( \frac{dT}{d\beta_1} < 0 \),

(17) \( \frac{dT}{d(\alpha_2/\alpha_1)} < 0 \).

Decreasing the time \( T \) required for attaining full employment, the optimal choice of technique is to increase either \( \beta_1 \) or \( \alpha_2/\alpha_1 \). The appropriate combination of both of these makes it possible to decrease the time required for attaining full

Figure 2
employment. The optimal situation can be realized at point $F^{**}$, where the growth frontier touches the full employment level and

$$\frac{K_{2}(T^{**})}{K_{1}(T^{**})} = \beta^{*} - n - n.$$

Thus the optimal growth path is illustrated as $S \rightarrow R^{**} \rightarrow F^{**} \rightarrow E^{**}$ on Figure 2. This optimal path can be realized after the optimal choice of technique.

(October, 1968)

REFERENCES

A NOTE ON SHORTER WORKING HOURS FOR SEAMEN

Hiromasa YAMAMOTO

After the introduction of the three-shift system on board of ships, the demand of seamen for shorter working hours has not resulted in the actual reduction of working hours, as demanded by the seamen, but has produced a shorter standard working week accompanied by an increase of overtime earnings. Though seamen of different countries have obtained standard working weeks of different length, all have in common that they work on a fifty-six-hour regular working week. This fact may lead to the opinion that the demands of seamen for shorter working hours in recent years are related only to wage calculation without any relationship to the regulation on actual working hours. However, the writer considers that their demands originate, similar to those of workers on land, from the protest against overwork and the desire for more leisure time. Based on this standpoint the writer will examine the relationship between the problem of shorter working hours and the early retirement of young seamen from the industry, as witnessed in many countries, and to propose ways for retaining seamen in the shipping industry.

I

Workers demand shorter standard working-days or working-weeks as one of their general demands for the improvement of their working conditions. The demands are based on the opinion that long working hours bring fatigue which could lead eventually to diseases and or absence from work. The labour movement of setting up a eight-hour working day was born as a protest against unhealthy long hours of work of ten hours and more. This state of affairs was gradually corrected by the labour movement for shortening working hours and the enforcement of the factory acts regulating hours of work. The change was partly due to the change of employers' attitude who recognized that shorter working days usually resulted in higher productivity of labour and it was not necessarily accompanied by the reduction of the total output.

With increasing income and shortening of working hours, the demands or workers for still shorter hours of work derive from a slightly different viewpoint. They put the stress on getting more leisure time not only for resting but
for their hobbies, studies and shopping, although some of them who are working under severe working conditions continue to demand shorter working hours as a requirement for their health.

Sometimes union leaders demand shorter working hours as a weapon against a decreasing demand for labour when a recession causes unemployment among union members. However, historically speaking working hours have shown a steadily decreasing trend following the pace set by the economic growth and the rise of the income level.

II

In the present time seamen of most countries work at sea on a basis of a fifty-six hour working week with a three shift system according to the provisions in trade agreements or the seamen’s acts except in the case of small vessels where the two-shift system is maintained. Though it is not our intention to describe the change of working hours at sea in detail, it is useful to indicate it briefly. At the beginning of this century seamen worked at sea on the two-shift system, and working hours sometimes amounted to seventeen or more hours without any extra overtime payment. Gradually the three-shift system was introduced on ocean-going vessels of various countries, and extended to cover smaller vessels. In 1936 the I.L.O. Maritime Convention adopted a convention according to which the hours of work at sea should not exceed eight in a day nor should they exceed fifty-six hours in a week for the crew on board of ships of 2,000 gross tons and over. Later in 1947 and 1957 the I.L.O. adopted new conventions on hours of work which remedied shortcomings and extended the coverage of the old conventions.

After the introduction of the three-shift system on board of ships, the movement by seamen for shorter hours of work has not resulted in an appreciable reduction of working hours at sea though the standard working week has gradually been shortened. For example, in the United States the National Maritime Union has gained a forty-hour week in 1951. However, men on watch have still to work eight hours in a day and fifty-six hours in a week, although day workers are not required to work on Saturdays and Sundays except for minimum routine duties. All works performed during the hours in excess of

(1) For this purpose, the documents of I.L.O. Maritime Conventions on hours of work and manning are useful.
(2) I.L.O. Convention, No. 57, Hours of Work and Manning (Sea) Convention, 1936.
the standard working week are compensated by overtime payments. In other countries where the standard working week of seamen is forty-eight, forty-four or forty hours, the same practice has, without exception, been adopted. In other words regular hours of work for men on watch are fifty-six hours in a week even if the standard working week is shorter. In short the reduction of the standard working week in the shipping industry has not been accompanied by the reduction of the actual working hours.

The fact that the reduction of the standard working week has not resulted in the reduction of actual hours of work does not necessarily mean that the shipping companies or seamen’s unions have made little effort for reducing the total hours of work. On the contrary some shipping companies have made considerable efforts for keeping overtime work at a minimum level in order to reduce overtime payments. Unions have often negotiated with managements in order to reduce excessive overtime work and demanded an increase of manning. Unions have also paid attention to minimizing overtime work at sea on Sundays and holidays.

However, no attempt has emerged either from seamen’s unions or employers to reduce the actual standard working day or to change the shift-system on board of ships. Therefore one can say that the demand of seamen for shorter hours of work is fictitious in the sense that it is not intended to affect the actual numbers of working hours in a week. Indeed, the problem of shorter hours of work at sea seems to belong to the system of calculating wages, and to have little relation with the regulation of actual working hours. But to the writer it seems necessary to reconsider whether or not the demands of seamen for shorter hours of work should belong to the system of calculating wages. Understanding of their demands might lead to an appropriate approach and policy for the retaining of seamen in the shipping industry.

The demand of seamen for shorter working hours derives, as it is the case of other industrial workers, from the fear that their health may suffer and also from the desire to enjoy more off-duty hours. After the introduction of the eight-hour working day and the three-shift system on board of ships the opposition to long hours of work seems to have become a minor or indirect factor. Improvement of accommodation and working conditions also provide

---

(5) Sharing this opinion is, for example, the “Final Report of the Court of Inquiry into Certain Matters concerning the Shipping Industry,” Feb. 1967, pp. 25–27.
seamen with more protection for their health. Although shipping companies introduced the eight-hour working day in face of the fact that fatigue of seamen caused loss of lives, vessels and cargoes, they are reluctant to shorten hours of work when the probability of marine accidents become fewer. Recently seamen's unions and employers deal with the volume of work load of the whole crew or of each member in relation with the manning scale under the three shift system, and not in relation with shortening the hours of work.

Here it should be pointed out that the shipowners' reluctance for the introduction of shorter working hours is due to the fact that it will result in a considerable increase of costs without bringing an appreciable improvement of labour-productivity. The operation of ships needs constant watchkeeping which is met in case of the three-shift system on a basis of the fifty-six hours a week. In addition, the berthing and sailing of ships cannot be timed in hours of the standard working day and necessitate overtime. Maintenance and repair works are also important factors requiring overtime. Consequently, in order to introduce a working week shorter than fifty-six hours, a considerable increase of the number of crew becomes necessary. In the shipping industry increase of manning means not only the increase of wage costs as in other industries, but also the increase of costs for additional food and accommodation on board. Larger space for accommodation decreases the space for cargo. Therefore, the actual reduction of the standard working week would burden shipowners with large expenses, and they rather choose shorter working weeks nominally and compensate hours of work in excess of the standard working day with overtime payment when unions demand shorter hours of work.

On the other hand, if unions demand shorter working hours for the sake of extra leisure hours, they tend to accept rather readily the shipowners' counterproposal, i.e., overtime compensation, when the overtime allowance rate is high enough, because the working and living conditions at sea are not suitable for enjoying leisure hours, as will be shown below and they give less value to leisure hours at sea than to those on land.

When working at sea seamen are forced to be separated from their families and friends and they cannot enjoy home life. On board the contact with other people is confined to the crew, especially to members of the crew belonging to the same shift. The hierarchy in the crew often hinders friendship between officers and ratings. Hobbies and amusements aboard are also limited. Reading, listening to the radio and talking with companions constitute the main ways for seamen for spending their leisure hours. Only a small number of ships have sporting facilities and movies for the crew. When seamen want to study some special subject, they often encounter difficulties to find correspondence
courses. Owing to the existence of all the conditions in the present working and living circumstances at sea of which some may be removed or relieved and some are inevitable, seamen cannot enjoy fully their leisure hours. Thus, it seems quite natural that they accept willingly more overtime earnings and paid vacation instead of an actual shortening of working hours at sea.

IV

Hereafter we shall examine the relationship between seamen’s wages and hours of work under the general tendency of shorter hours of work. As workers on land obtain shorter hours of work and improvement in real income, which enables them to enjoy their leisure hours in and out of their homes, it seems obvious that seamen tend to want more leisure hours, too and at the same time that they will feel that their working and living conditions at sea are more disadvantageous. Therefore, seamen do not remain in the shipping industry unless they feel that the increase of their wages earnings is high enough to compensate for their disadvantageous working conditions. In fact, in the shipping industry wage rates and overtime rates have shown a steadily increasing trend, and the wage differential between seamen and workers on land has changed favorably for the former.\(^1\) It is expected that in future this tendency becomes even clearer.

By the way, do seamen consider the present wage rates and earnings as being enough compensation for their disadvantageous working conditions? The labour shortage in the shipping industry of many countries can be regarded as a phenomenum due mainly to the dissatisfaction of seamen with regard to their wages and working conditions. In Japan, for example, the number of applicants into Merchant Marine Academies and high schools has shown the decreasing tendency in spite of the growing demand for seamen in Japan. In addition, in the coastwise trade many seamen flow out into other jobs on land and result short supply of seamen.\(^2\) Indeed, as one of the main factors which induces the movement of workers from one job to another, the opportunities of finding jobs should be taken into account in addition to the difference of wages and working conditions. But in the Japanese shipping companies the number of available jobs has increased in recent years and also there is no institutional

---


hindrance for young seamen to find jobs in the merchant marine. Therefore we may conclude that the flow out of young seamen from the Japanese shipping industry is due to their dissatisfaction of not being properly rewarded in comparison with their working conditions. Our conclusion shows the urgent necessity of establishing a policy by the Government and the shipping companies for retaining seamen in the industry. The problem of shorter hours of work should also be considered in this context.

V

Seamen are, as has been mentioned, in an unfavorable position on board of ships with regard to enjoying their leisure hours. What can be done for the improvement of their state?

As a first step, the improvement of recreation facilities should be considered as a comparatively easy remedy. Together with the provision of libraries, indoor game facilities and movie films, provisions of sporting facilities are most desirable because in sports seamen are able to spend their leisure time actively in contrast to the passive enjoyment of other amusements. Deck tennis, table tennis and deck golf are some of the sports which can be easily played by everyone and can be introduced on board with rather small expenses. Development of new types of sport which are suitable to be played aboard are also desirable. In cooperation with seamen’s unions, shipping companies should plan and carry out recreation programs which are adequate to the type of ships and trade routes. As a next step, correspondence courses for seamen should be improved and enlarged in order to give seamen the opportunities for the acquisition of higher licenses and studying other subjects. Through such improvements we can expect that in the future seamen will utilize their leisure time at sea better.

Furthermore the adoption of a port relief system is desirable in order to give the crew leisure hours in port if we consider the recent situation that owing to the improvement of loading facilities and a quicker turn round of ships seamen have to spend busier hours in port resulting heavy work load on them. It is also necessary to establish in more ports seamen’s clubs where seamen can rest and spend their leisure hours.

However, so long as seamen work at sea, it is impossible for them to enjoy their home life if we neglect the exceptional case in which companies allow wives to accompany their seagoing husbands aboard. The early retirement from the shipping industry of young seamen, especially that of newly married ones seems to be related with this problem. Even if actual shorter hours of work at sea are realized, it will not satisfy the seamen’s desire for more enjoyable
leisure hours. Only vacations will afford them the opportunity of enjoying their home life and to have activities which are impossible at sea. Therefore paid vacations and home leave have far more importance for seamen than for workers on land. Although shipping companies and unions conclude minute agreements on vacation, little consideration has been paid to the relationship between the seamen's desire for leisure hours and vacation. If we consider that vacation is the sole and indispensable occasion for seamen to have a home life, vacations should be provided regularly in shorter intervals, and of longer duration.

An increase of vacations will induce the increase of labour costs in various ways. The provision of paid vacations will result in additional wage costs. Even in the case of vacation on leave wage costs for relief crew become necessary. However, in any way the supply price of seamen will rise with their increasing distaste for working conditions at sea, of which the separation from life on land is most keenly felt, and which is beyond the control of the shipping companies. In order to retain seamen in the industry with a minimum increase of labour costs it is necessary for the management to reexamine forms in which the labour costs should be allocated. Whether or not the improvement of new vacation plan is more effective than a similar expense for wage increases or the improvement of several working conditions depends on the level of wage earnings and social customs, and it is difficult to come to a clear conclusion. But it can be expected that the vacation plan tends to become more important for seamen than the increase of wage earnings, because with rising income their desire for more leisure is getting greater than that for additional wages.

In the foregoing discussion, we have not touched on the relation between hours of work and the change of working conditions which has been brought by the technological development in the shipping industry. Today the technological development on board of ships is in a transit period, and physiological and psychological research concerning work load, fatigue and productivity of labour on automated ships remain in an early stage. If the introduction of automation apparatus on board of ships increases the mental fatigue of seamen, then shorter hours of work must be reconsidered from a different view point than that of this article.
OBJECTIVITY REEXAMINED

Isao Nakano

1

The "objectivity" concept is still regarded as an important criterion for deciding acceptable accounting principles and methods and for denoting an essential property of accounting informations. However, opinions differ as to the exact meaning of this concept and as to the concrete requirements for achievement of "objectivity". In other words, no precise and uniform definition of this term has been established.

In this paper various views (or definitions) of the "objectivity" concept will be examined, their mutual relationships probed, and further, possible ways to settle existing and misleading interpretations of this concept will be suggested.

2

Five different views on the meaning of "objectivity" will be shown and examined here.

(1) The definition of "objectivity" as "possibility of substantiation".

The proponent of this definition is Professor H.A. Arnet. Though not explained by him, the word "substantiate" means "insure the accuracy of—by the weight of evidence" according to Kohler's "Dictionary for Accountants". Perhaps with such an interpretation of the word in mind, Professor Arnet asserts "any data which are considered useful are objective to accountants, provided they are substantiated or capable of being substantiated by an independent party". Thus, his suggestion is that objectivity of a given datum or information exists when it is supported by any valid evidence. Then, when is


meant by "evidence"? On this point he says, "This type of evidence may range all the way from supplier's invoices and mathematical formulas, to data derived from the use of index numbers and fair market values."(4)

This "objectivity" concept is characteristic in that it has been "inferred from the practices and assertions of accountants". (5) In other words, it is claimed that "if the term 'objective' is to be valid at all, it should be applicable to any and all items that the accountant reflects in the accounts and financial statements",(6) and from this viewpoint this "objectivity" concept has been developed as that attribute which can (or should) be shared by all items in the financial accounting. In this sense this definition tends to justify the accounting system as it is.

(2) The definition of "objectivity" as "consensus among different measurers" or "repeatability".

According to Professor C.H. Stanley, one meaning of "objectivity" is the "agreement in the results of experiments made by different experimenters"(7) and this sense of objectivity is attained, "when it is possible for different experimenters to perform the same operation with reasonable agreement in their results. 'Repeatability', then, is the test for determining the presence of this kind of objectivity."(8) Also Professor W.B. Meigs and Professor Ch. E. Johnson say, "if a measurement is objective, 10 competent investigators who make the same measurement will come up with substantially identical results."(9) Professor Y. Ijiri adopts this concept of objectivity, defining it as "the consensus among a given group of observers or measurers."(10)

Strictly speaking, however, the phrase "consensus among different measurers" or "repeatability" seems to be open to the following two interpretations.

(2a) One interpretation would be that the hypothetical measurers should be able to reach the same results when they follow the same judgements and use the same accounting methods as were actually adopted by the firm. (For example, if a firm has valued a certain item of inventory with the periodic average method, the hypothetical measurers are also assumed to use the same inventory

---

(4) Ibid., p. 188.
(5) Ibid., p. 179.
(6) Ibid., p. 183.
(7) Curtis H. Stanley, Objectivity in Accounting, Ann Arbor, Michigan 1965, pp. 2d3.
(8) Ibid., p. 4.
method regardless of the presence of other alternative methods such as the specific identification method, the fifo method, the lifo method etc).

(2b) The other interpretation would be that the hypothetical measurers should be able to come to the same measures when the choice of any accounting method from those available within the accounting system is possible regardless of the method actually selected by the firm (except when the principle of consistency forces them to follow the same method as that used by the firm). (For instance, even if a firm has valued a new item of inventory with the periodic average method, the hypothetical measurers are assumed to be free to select any inventory method which appears most appropriate to them).

The proponents of “objectivity” concept as “consensus among different measurers” or “repeatability” have not made clear which of the above-mentioned two kinds of “consensus” or “repeatability” they have had in mind. In this sense, their definition seems to lack exactness.

(3) The definition (or interpretation) of the “objectivity” concept as “measurability with (reasonable) accuracy”.

Professor F.W. Windal, considering the term “objective”, insists that “objective” is the opposite of “subjective” and therefore, in order for an item to be sufficiently objective for recognition, it must appear substantially the same to all accountants examining it. And “the quality of measurability seems to satisfy to a large extent the demand for objectivity. If an item can be measured with reasonable accuracy, it assumes a large degree of objectivity”.{11}

But the exact meaning of the term “measurability with accuracy”{12} is not

---


(12) Of course, the concept “measurability” is used by Professor Windal not in the sense of “measurability with perfect accuracy” but in the sense of possibility of measurement within reasonable variation limits, as is indicated by the following quotation: “This factor ("measurability") has a broad connotation; an item is considered to be measurable, if it can be estimated with a reasonable degree of accuracy. The depreciation of fixed assets, for instance, is considered to be measurable even though it is based on an estimate. Likewise, the income on long-term construction contracts is estimated.” (Floyd W. Windal, op. cit., p. 75).

In the phrase “measurability with (reasonable) accuracy”, what is the exact meaning of “accurate” and how is it different from “precise”? “Accuracy” is generally defined as “the success with which the nearness to a true value is attained”, while “precision" relates “to the tendency of tests to give the same value even though the value is inaccurate” (Eric L. Kohler, A Dictionary for Accountants, 3rd ed., Englewood Cliffs, N.J. 1963, p. 20).

Further one might question what the difference between “measurability with (reasonable) accuracy” and “accuracy” is. It seems to me that the latter concept refers to a correspondence of a measurement object with its valid measurement result (or figure), but the former concept means freedom from subjective biases in the measurement process in order for "accuracy" of the measurement result to be approached. In other
clear at all and seems to be open to the following two alternative interpretations. Moreover we cannot tell which of the two interpretations Professor Windal has agreed to.

(3a) One interpretation would be that when several alternative sorts of judgements and accounting methods are available as to measurement of one and the same object within a business accounting system, the possible different measures (by using each judgement and accounting method) would be all "accurate" (so long as calculated correctly in the arithmetical sense) and therefore all these measurements would have the quality of "measurability with accuracy". (For example, when one selects one inventory pricing method from the group composed of the specific identification method, the fifo method, the lifo method, the periodic average method, the moving average method etc., any measurement result calculated correctly by applying any selected inventory method to the total inventory cost — including the beginning inventory cost — of the period would be regarded as "accurate" and therefore with respect to one measurement object one could think of the "measurability with accuracy" by the specific identification method, the fifo method, the lifo method etc.).

(3b) The other interpretation of the phrase "measurability with accuracy" would be that since "accurate" means "the success with which the nearness to a true value is attained"(13), only "one" accurate measure would be possible as to one measurement object within one accounting system (or for one accounting purpose). If this interpretation is adopted, strict logic would lead to the conclusion that when the result of the calculation by one — say the specific identification method — of several alternative accounting methods is the "accurate" measurement, then the result by any other method (ex. the fifo method, the lifo method, the average methods etc.) will have to be regarded as "inaccurate" even though the latter measurement might have been made correctly in the arithmetical sense. In other words, according to this point of view the "measurability with accuracy" would exist only where one accurately measured figure can be given to the measurement object concerned. Therefore, when a free choice of an adequate accounting method from several alternative ones is permitted without any rule or convention to specify which method should be used in a given situation (except the principle of consistency), no logical assurance exists that this kind of "measurability" is perfectly attained in practice.

words, the former is concerned with a characteristic of the "measurement process" of accounting, but the latter means a "relation between a measurement object and its measured result".

(13) Eric. L. Kohler, A Dictionary for Accountants, op. cit., p. 20. Also see the footnote (12) of this paper.
The definition of "objectivity" as "deductive certainty". This is the second "objectivity" concept developed by Professor C.H. Stanley besides his first definition of the term as the "consensus among different measurers". According to this view, "objectivity" in the sense of "deductive certainty" may be said to exist when "the relationship between, say, two statements is a matter of deductive logic. Where the implications of a statement are determinable by the application of deductive logic to that statement, all persons acting as logicians will arrive at the same conclusions, assuming that the rules of deductive logic are known and applied correctly. The statements of mathematics, for example, are objective in this sense". (14)

The significance of this concept in the context of business accounting is pointed out by Professor Stanley as follows:

(a) Accounting theories, he says, are (or should be) developed by the consistent application of deductive logic to postulates and definitions which have been established as the starting point. And this way of formation of accounting theories means providing them with the "objectivity" in the sense of "deductive certainty". (15) Therefore, one important role of this "objectivity" concept would seem to lie in that it denotes a desirable feature to be shared by accounting theories as formal systems.

(b) The "objectivity" concept in the sense of "deductive certainty" would indicate, he asserts, a characteristic of the double-entry book-keeping. Namely, he says that this book-keeping system can be developed by the application of the rules of logic and arithmetics to several predefined concepts — in Stanley's explanation four concepts of "time", "entity", "asset" and "liability" — and that in this sense the double-entry book-keeping does possess the "objectivity" as deductive certainty. (16)

Therefore, in Stanley's book this concept of objectivity is regarded as denoting a characteristic of the double-entry book-keeping or of a desirable accounting theory. However, in the context of objectivity as applied to accounting data, he uses the term "objectivity" only in the sense of the "consensus among different measurers" but not of the "deductive certainty". "Objectivity of an accounting system" as deductive certainty will probably be related with the "objectivity of the accounting data" produced by the system, but the exact relationship

(14) Curtis Holt Stanley, Objectivity in Accounting, op. cit., p. 3.
(15) Ibid., p. 17 and p. 106.
(16) Ibid., pp. 20–30.
between the two concepts has not yet been made clear.\(^{(17)}\)

(5) The definition of “objectivity” as “freedom from biases against the accounting purposes”.

Professor R.J. Chambers and Professor P.E. Fertig, insist that the “objectivity” concept should be defined as the freedom of actual measurement results from biases against the really desired figures on the part of the readers of the financial statements (therefore, against the accounting purposes) rather than as the formal “verifiability,” since all the concepts and methods of business accounting should be developed from the viewpoint of what is desired by the users of the financial statements. “If we are to measure such things as ‘financial position’ and ‘income’, and to obtain objective measures of them, it is necessary, at the outset, to define what we mean by these terms”.\(^{(18)}\) “Only if we know what we are setting out to measure, can we have an idea about the biases which may arise or about the value to which we seek an approximation”.\(^{(18)}\) And based on this standpoint, “the evidence of the purchase cost of an asset may be highly verifiable evidence, but obviously the statement that this purchase cost is an unbiased (i.e., “objective” in the broader sense of the word) measure of current value is completely unjustified”.\(^{(20)}\)

Though such a definition of the “objectivity” concept is theoretically very attractive, practical application of this concept would require “a consensus on what we are setting out to measure, i.e., general agreement on the goals of accounting and the objectives of the users of accounting information. This we

\(^{(17)}\) Of the possible relationships between the two objectivity concepts one thing is clear: “deductive certainty” as applied to an accounting system cannot always be the sufficient condition for the objectivity of accounting data (in the sense of “possibility of substantiation”, “consensus among different measurers” or “measurability with accuracy) to be attained. For instance, the income concept as a difference between the discounted present values of future net cash inflows at the beginning and the end of a period is theoretically very consistent and has deductive certainty, but uncertainty about the future events would deprive the income figure of almost all “objectivity” concerning accounting data. (As to this income concept, refer to the following literature: Ronald S. Edwards, The Nature and Measurement of Income, The Accountant 1938; Sidney S. Alexander, Income Measurement in a Dynamic Economy, The Study Group on Business Income of the American Institute of Accountants, Five Monographs on Business Income, New York 1950, pp. 1–95; G.E. Philips, The Accretion Concept of Income, the Accounting Review, Jan. 1963; David Solomons, Economic and Accounting Concepts of Income, the Accounting Review, July 1951; Palle Hansen, The Accounting Concept of Income, Kopenhagen 1962; Emily Chen Chang, Business Income in Accounting and Economics, the Accounting Review, Oct. 1962).

\(^{(18)}\) R.J. Chambers, Measurement and Objectivity in Accounting, the Accounting Review, April 1964, p. 268.

\(^{(19)}\) Ibid., p. 268.

OBJECTIVITY REEXAMINED

seem to lack to a serious degree”.(21) For example, there is still no agreement of opinions upon which of the alternative valuation bases such as the historical cost, the adjusted cost (on the basis of a general price index) or the replacement cost is theoretically most proper for accounting purposes. And as the case stands now, no one can tell to what a degree a given accounting data has attained the objectivity in the sense of “absence of biases against the accounting purposes”.(22)

3

The above analysis has made it clear that among people with different “objectivity” concepts in mind useless differences of opinion might occur as to the extent of “objectivity” which the present business accounting system will be able to achieve. To illustrate this state of affairs, a person thinking of the “objectivity” concept in the sense of “verifiability (or possibility of substantiation)” (1) would say, “The existing accounting system can attain a sufficient degree of objectivity”, while another insisting upon the “objectivity” concept as the “measurability with accuracy (3b)” would probably object that “the extent of currently available objectivity is far from enough”. Reexamination of this concept seems necessary for avoidance of such a needless disagreement.

One possible solution would be defining the “objectivity” concept anew clearly, concretely and unanimously. In this case, if the concept is to be given the definition “consensus among different measurers (2)” or “measurability with accuracy (3)” care must be taken to indicate which of the two alternative interpretations (i.e. (2a) or (2b), or (3a) or (3b)) should be followed. Of course, one could conceive some other definition than the above mentioned five possibilities, since those views on objectivity are mere illustrations.

The other, increasingly influential trend is discarding the abstract and metaphysical “objectivity” concept in favor of a more concrete and operational one. For instance, Professor N.M. Bedford has insisted as follows: “The

(21) John W. Wagner, Defining Objectivity in Accounting, the Accounting Review, July 1965, p. 604.

(22) When we compare the “freedom from biases against accounting purposes” with the “measurability with accuracy”, the latter concept requires an accurate measurement in accordance with the explicit or implicit accounting principles and procedures in a specific business accounting system as it is, while the former would mean the absence of accounting data from biases against theoretically claimed (valid) accounting purposes regardless of the accounting principles in the existing accounting system. So, the acquisition cost of an asset may completely meet the requirement of “measurability with accuracy” (3b), but whether the data has the characteristic of “freedom from biases against accounting purposes” or not is quite uncertain.
term objectivity has been used to designate certain characteristics which will provide for a standard count of money income by different accountants. The idea is that only things which can be objectively observed by everyone should be counted. This approach seems to have promise, but the use of "objective" may be unfortunate. Unprofitable discussions on whether or not something is objective or subjective have been carried on without regard to the problem objectivity was intended to solve. If an acceptable count is defined as the count that would result if different accountants were to do the counting, it could well be that counting the amount of income would not be such an unsettled issue as it now is".

Abandonment of the abstract and disturbing "objectivity" concept is claimed here in support of the concept "agreement (of measures) among measurers (accountants)". Further, the AAA's recent monograph, "A Statement of Basic Accounting Theory" does not include the objectivity concept as a criterion for selecting accounting information, but the content of the concept has found its way in the monograph under the name of "verifiability". Thus, a recent significant trend may be said to lie in discarding the abstract and disturbing concept of "objectivity" in favor of a clearer and more concrete concept, say, "consensus among measurers (repeatability)".

To sum up, a reexamination of the "objectivity" concept should be carried out along either direction.


A NOTE ON THE BEHAVIORAL THEORY OF INNOVATION

Hideki YOSHIHARA

I

"The behavioral theory of organizational decision-making," as developed by Chester I. Barnard, Herbert A. Simon, and James G. March, have focused one of its main research interests on the subject of innovation in an organizational context. And a theory of organizational innovation evolved as one of its main subtheories. We shall call this parcel of theory "the behavioral theory of innovation."

In this note we would like to do three things regarding the behavioral theory of innovation, that is, (1) to make clear its basic framework, (2) to add some critical comments upon it, and (3) to make a couple of proposals for solving its shortcomings.

The behavioral concept of innovation might be best described in the following proposition by March and Simon. They said:

Initiation and innovation are present when change requires the devising and evaluation of new performance programs that have not previously been a part of the organization's repertory and cannot be introduced by a simple application of programmed switching rules.

Under a relatively stable environment an organization carries out its goals and tasks smoothly and efficiently with its performance programs. But, when the environment changes on a large scale, this becomes difficult. For, the existing programs are not effective under the new circumstances. Then, it becomes necessary for the organization to change the existing programs or develop new ones to adapt itself to the new environment. This kind of adaptive behavior is defined as an innovative behavior or simply as an innovation.

On the basis of the previous description, we may summarize the core of


(2) James G. March and Herbert A. Simon, op. cit., pp. 174–175.
the behavioral theory of innovation in the following two propositions:

1. An organization initiates innovative behavior when it fails to satisfy its goals or anticipates such a failure in the immediate future.
2. The innovative behavior is directed toward devising new performance programs.

We shall examine the behavioral theory of innovation along these two lines in the following sections.

II

Any theory of human behavior has a set of assumptions about human behavior. In the case of the behavioral theory of organizational decision-making a model which is called “the general model of adaptive motivated behavior” is laid for such a set of assumptions. The model is defined by the following propositions:

1. The lower the satisfaction of the organism, the more search for alternative programs it will undertake.
2. The more search, the higher the expected value of reward.
3. The higher the expected value of reward, the higher the satisfaction.
4. The higher the expected value of reward, the higher the level of aspiration of the organism.
5. The higher the level of aspiration, the lower the satisfaction. (3)

The model is portrayed in Figure 1. (4)

(3) Ibid., p. 48.
(4) Ibid., p. 49, Figure 3.5.
Now, let us pay attention to the first proposition. From it we can derive a relationship of "dissatisfaction \rightarrow search \rightarrow a change in programs." And this relationship represents an essence of the behavioral theory of innovation. We may summarize the essential assertions of the theory in the following three propositions:

1. Dissatisfaction (or a problem) induces search.
2. Induced search results ordinarily in innovation.
3. Innovation solves dissatisfaction (or the problem).

These three propositions may be portrayed as in Figure 2 which is a slightly adapted version of Figure 1.

![Diagram](image)

Figure 2

On the basis of the above argument we may well conclude that the behavioral theory of innovation is built upon the adaptive model of human behavior. Cyert and March have applied the term "problem-oriented innovation" to the behavioral concept of innovation that we have just examined. Following their terminology, the behavioral theory of innovation may be said to have been developed as a theory of problem-oriented innovation.

It must be pointed out here that the theory of problem-oriented innovation has difficulty in explaining and predicting some kinds of innovation in organizations. Let us show a couple of examples that evidence this.

A recent study of research spending over a ten-year period in five large organizations...

---

firms revealed that decreases in research activity followed decreases in sales and/or profits.(6) This empirical evidence appears inconsistent with the theory of problem-oriented innovation. For, the evidence shows that a problem — in the above case, decreases in sales and/or profits — suppresses rather than stimulates an innovative behavior of organization — in the above case, research activity —.

E. Mansfield revealed that it was impossible to confirm empirically the hypothesis that, other things being equal, relatively unsuccessful firms would be quicker than relatively successful firms to begin using a new technique.(7) This evidence also appears to cast a doubt upon the concept of problem-oriented innovation.

Thus, the theory of problem-oriented innovation as it exists has difficulty in explaining and predicting some kinds of organizational innovation.(8)

As a tentative solution to this difficulty, a new concept of slack innovation has been introduced by Cyert and March.(9)

Organizational slack is the difference between the payments required to maintain the organization and the resources obtained from the environment by the organization. In general, success tends to breed slack. One of the main consequences of slack is a muting of problems of resource scarcity. Slack provides a source of funds for innovative projects that would not be approved in the face of scarcity but that have strong subunit support. These are not problem-oriented innovations. For, they are not directly linked to any specific problems. They contribute mostly to subunit goals such as professional status and subunit prestige. These slack innovations are expected to give a rather reasonable explanation to the fact that relatively successful firms (thus firms with substantial slack) are more likely to introduce some kinds of innovation.

But the concept of slack innovation seems to have the following shortcomings. One shortcoming is to be found in the treatment of the motive to innovate. As described above organizations do not have any specific problems to solve. In spite of this, innovative projects are approved and implemented in organizations. Why? Because there are plenty of resources not committed to any going operations or plans at hand, and subunits strongly demand the approve-

ment of their innovative projects to raise their status in the organization. Thus, it may be said that in the case of slack innovation the motive to innovate is explained largely in terms of subunit group demands.

We are inclined to think that this treatment of motivation is not satisfactory. Suppose a case in which a certain subunit strongly demands the approval of its innovative project. It is a large scale one, so its implementation is considered to exert a substantial influence upon the whole organization. In such a case, to be approved it is necessary for the innovative project to find support by other subunits and especially by the top management. These inside supports will likely be given when the project is judged to contribute effectively to the solution of certain problems that the organization has. If so, to explain the motive to innovate in terms of resource affluency and strong subunit group demands can not be a satisfactory one. We hold it is necessary to introduce explicitly the notion of "dissatisfaction (or a problem)" in the treatment of the motive of slack innovation.

Next, we may point out that the theory of slack innovation is not consistent with the basic assumptions of the behavioral theory of organizational decision-making. It is assumed that dissatisfaction or a problem induces organisms to undertake search behavior for new performance programs. Whereas, slack innovation is one which is to be made by relatively successful organisms having no pressing problems. Thus, the concept of slack innovation is not consistent with the model of adaptive behavior underlying the behavioral theory.

From the above argument we have learned that it is necessary to re-develop the behavioral theory of innovation in the direction toward overcoming difficulties or limitations of both the concept of problem-oriented innovation and that of slack innovation within the basic framework of the adaptive model.

Now we would like to present one proposal for the re-development of the behavioral theory of innovation.

We introduce the idea of a hierarchy of motives(10) into the adaptive model of human behavior. When lower motives such as physiological needs are not sufficiently satisfied, human beings concentrate their efforts to the satisfaction of these motives. In such a circumstance higher-order motives such as esteem-needs or lust for power remain unevoked and therefore exert almost no effect upon human behavior. But, once lower motives are sufficiently satisfied, these higher-order motives are evoked and become the main motivational forces for actions.

Then, along the lines suggested we may re-develop the behavioral theory

of innovation in the following way. We assume that we can distinguish types of innovative behavior. For example, we assume two types. Let one be called "an innovation for survival," and the other "an innovation for growth." The former would be induced when the survival of the organization is in danger. And its function would be to secure its survival. So, in the case of business organizations, it would take such forms as cost-reduction projects, disposal of unprofitable plants, reduction of administrative personnel, and curtailment of research spending. The innovation for survival corresponds roughly to problem-oriented innovations.

On the other hand, the second type of innovation, an innovation for growth, would be induced when the organization has no pressing survival problems, but does not have its motive for growth satisfied yet. And it would take such forms as diversification strategies, increases in research spending, and capital investment for modernizing plants. It is approximately equivalent to slack innovations.

As for organizational slack, it should be treated as a resource for innovation. The more the organizational slack, the easier the implementation of innovation.

III

In the behavioral theory of innovation, as has been mentioned in the first section, a change in performance programs is defined as innovation. This is the second major distinctive point of the theory. In this section we will examine this point.

Generally speaking, organizations take innovative actions to adapt themselves to the changing environment. For example, in the case of business organizations the following actions may be taken; changing standard procedures for price and output decisions, altering inventory control systems, the introduction of new technology, changing the organizational structure and/or the product-market posture.

Now, we may naturally raise the question whether it is possible to cover all these innovations with the behavioral concept of innovation, that is, the concept of a change in programs.

For example, the change of standard procedures for price and output decisions is reasonably considered to be a change in programs. Similarly, the alteration of inventory control systems may suitably be called a change in programs. Then, what about the introduction of new technology or the change of product-market posture? Is it reasonable and meaningful to regard these as a change in programs?
A change in programs should be interpreted as a change in decision rules. This is what March and Simon originally intended to mean. Thus we arrive at the following conclusion. The behavioral concept of innovation developed largely by March and Simon is concerned with only those innovations which represent changes in programs. The other innovations are outside of its domain. This is surely a shortcoming of the theory.

To remedy this shortcoming we must substitute some new concept for a change in programs.
KOBE ECONOMIC & BUSINESS REVIEW

CONTENTS

NO. 1 (1953)
Present Day Significance of Free Ports...........................................Ginjiro Shibata
Development of Devaluation-Problem in Post-War Japan........................Kiyozo Miyata
Japan's Trade with South and South-East Asian Countries......................Fukuo Kawata
The Exchange Control Policy in Post-War Japan....................................Masahiro Fujita
On the Official Statistics of Foreign Trade in the Post-War Japan........Hikoji Katano
On Business History........................................................................Tadakatsu Inoue
Problems of Regional Industrialization in Japan.......................................Minoru Beika
A Research of Wage Income in Post-War Japan........................................Nobuko Nosé
Revaluation in Japan............................................................................Susumu Watanabe
Last-In, First-Out Inventory Method under the Japanese Tax Law...............Munehiro Masuzaki

NO. 2 (1954)
Movements for the Establishment of Free Ports in Japan........................Ginjiro Shibata
Japan's Trade with Latin America in the Post-War Years..........................Fukuo Kawata
The Maritime Competitions in the Early Meiji Era....................................Seiji Sasaki
Two Deflations in the Showa Era..........................................................Masahiro Fujita
Estimation of the Effectiveness of Devaluation on Balance of Payment Deficit in Japan........Hikoji Katano
The Recovery Method of the Japanese Shipping Industry in Post-War Period........Hiromasa Yamamoto
Business Accounting and Tax Accounting.............................................Susumu Watanabe
Spatial Characteristics of Industries relative to their Business Features........Minoru Beika
Stages in Factory Organization............................................................Tadakatsu Inoue
Accounting for Fixed Assets Revaluation; Recent Views in Japan........Munehiro Masuzaki
On the Structure of the National Income Distribution in Japan..............Nobuko Nosé

NO. 3 (1956)
Industrialization and International Trade..........................................Fukuo Kawata
Econometric Determination of Foreign Exchange Rate of Japan for 1926-1953.....................................................Hikoji Katano
Present Status of Japan's Shipping......................................................Ginjiro Shibata
The Distinction between “Shasen” and “Shagaisen” as Historical Concepts in Japanese Shipping.....................................................Seiji Sasaki
The Banking System in the Middle Meiji Era (1870-1910)........................Masahiro Fujita
Disposition of Cost Variances in Japanese Tax Law................................Susumu Watanabe
Structure of Industrial Districts in Japan..............................................Minoru Beika
Note on the ZAIBATSU Combines......................................................Tadakatsu Inoue
On the Model-Building for Social Accounting Design............................Nobuko Nosé

NO. 4 (1957)
The Impact of Exchange Policy on the International Economy of Japan during the Period 1930-1940.............................................Laurence P. Dowd
A Note on the Recent Trends of Japan's Foreign Trade............................Fukuo Kawata
The Development of Overseas Banking System in Japan in the Meiji Era..........................Masahiro Fujita
More on the Structure of National Income Distribution in Japan ..........Nobuko Nose
Reconstruction of the Theory of Purchasing Power Parity ...............Hikoji Katano
Tramp Shipping Freights and International Trade .........................Ginjiro Shibata
A Little Study on the Transition from the Sailing Vessel to Steamer in Japan .................................................................Seiji Sasaki
On the Regulating Policy of Japan against the Shipping Conference — Especially in relation to the Refusal of the Entry to New Comers .........................................................Hiromasa Yamamoto
The Price Fluctuation Reserve System in Japan ..............................Susumu Watanabe
Locational Problem in the New Major Branches of Japanese Industries from 1954 to 1956 .................................................................Minoru Beika
Business Problems in an International Situation ..........................Tadakatsu Inoue

NO. 5 (1958)

History of Yen — Its Developments in the Japanese Economy (1) .......Hiroshi Shinjo
Fundamental Features of the Accumulation of Capital in the Late Meiji Era .................................................................Masahiro Fujita
Some Aspects of Japan’s Trade with South and South-East Asia, 1950–1957 .................................................................Fukuo Kawata
Curves of Diminishing Values of Japanese Merchant Ships in Proportion to Their Age .................................................................Ginjiro Shibata
The Modernization of Japanese Shipping based on the Transportation of Hokkaido Marine Products ........................................Seiji Sasaki
Development of the Marine Insurance Industry in Japan in the Meiji Period .................................................................Hiromasa Yamamoto
A Assimilação do Imigrante Japonês no Brasil .............................Hiroshi Saito
Rate of Profit and International Specialization of Production ............Hikoji Katano
Replacement Cost and Lifo Cost .........................................................Susumu Watanabe
Spatial Problems of Business Activities ........................................Minoru Beika
The Nature of the Morgan Control ..................................................Tadakatsu Inoue
On the Effect of Accelerated Amortization for Tax Purposes ..........Nobuko Nose

NO. 6 (1959)

History of Yen — Its Developments in the Japanese Economy (2) .......Hiroshi Shinjo
The Central Banking Policy in the Meiji Era .................................Masahiro Fujita
Economic Growth, Balance of Payment and Capital Movement ..Hikoji Katano
World Trade and Japan’s Export — 1953–1957 — ........................Fukuo Kawata
Alguns Aspectos da Mobilidade de Japoneses no Brasil .....................Hiroshi Saito
Problems of Emigrant-Transportation in Japan ..........................Hiromasa Yamamoto
Port Labor Conditions in Japan ......................................................Ginjiro Shibata
The Development of the Concept “Operator” in Japan ..............Seiji Sasaki
Single Industry Towns in Japan .........................................................Minoru Beika
On the Application of the Social Accounting Principle to Business Accounting .................................................................Nobuko Nose
Valuation of Work in Process .........................................................Susumu Watanabe
Developmental Stages Relating to Theories of Stock-Equity Accounting .........................................................Ryuji Takeda
On the Rate of Interest in Business Administration ......................Jiro Ono
Various Classes of Data Processing by Means of Electronic Computer .................................................................Hideo Kitani
Company Histories in Japan .........................................................Tadakatsu Inoue and Yoshiro Ikushima

NO. 7 (1960)

Japanese Emigration and Its Effect on International Payments ......Ginjiro Shibata
One-to-One Correspondence Between Goods and Factor Prices
Hikoji Katano

The Gold Standard and Banking Capital in Japan
Masahiro Fujita

World Trade and Economic Growth
Fuku Kawata

Singularity in the Structure of the Seamen's Union of Japan
Hiromasa Yamamoto

Some Reflections on Inter-Comparability of Social Accounting
Nobuko Nose

The Meaning of Inventories
Susumu Watanabe

Structure of Income Determination on the Balance Sheet
Ryutaro Lake

On the Value of Stock Rights and Its Significance
in Corporate Finance
Jiro Ono

Business Features and Management Policies of Industrial
Enterprises in Local Districts of Japan
Minoru Beika

NO. 8 (1961)

The Industrial System and Industrial Education in Southeast Asia Now on
the Threshold of Reform; and Japan's Position therein
Kiyosho Miyata

Industrial Structure and Educational System in India
Tadao Miyashita

Industrial Education in India
Tadao Miyashita

Technical Education in India
Tadao Miyashita

Industrial Structure and Vocational Education in Thailand
Fuku Kawata

The Industrial Structure and Industrial Education
in the Philippines
Tel-ichi Yamasaki

Industrial Structure and Vocational Education in Indonesia
Hiromasa Yamamoto

NO. 9 (1962)

Problems in Port Administration and Finance in Japan
Ginjiro Shibata

Types of Early Modern Japanese Shipowners
Seiji Sasaki

On the Employment System of Seamen in Japan
Hiromasa Yamamoto

A Study on Japan's Invisible Trade
Fuku Kawata

Problems of Industrial Location relating to Regional Development in
Japan
Minoru Beika

The System of Inside Contracting
Tadakatsu Inoue

A Critique on Professor Mahalanobis Model of Economic
Planning in India
Hikoji Katano

National Income Concepts: Reconsidered
Nobuko Nose

Some Problems of the Installment Basis
Susumu Watanabe

On the Purposes of a Going-Concern Valuation and its Natures
Jiro Ono

Die Betrachtungsweise der neueren betriebswirtschaftlichen
Kostentheorie
Tetsuo Kobayashi

NO. 10 (1963)

Revised Accounting Provisions of the Commercial Code of Japan
with Special Reference to the
Corporation Income Tax Law
Susumu Watanabe

Social Accounting as an Instrument of Policy
Nobuko Nose

Industrial Estates for Small Businesses in Japan
Minoru Beika

Rise of the Mutual Financing Business in Japan
Tadakatsu Inoue

The Introduction of European-Style Vessels in Japan:
A Historical Survey
Seiji Sasaki

On Industrial Relations in Japan's Shipping Industry — with
Special Concern on Personnel Management
Hiromasa Yamamoto

Regional Disparities in the Brazilian Economy:
A Case Study on the Brazilian Northeast
Yoshiaki Nishimukai

The Basic Concepts of Going-Concern Valuation
Jiro Ono

A Study on the Current Cost Theory of Fritz Schmidt
Isao Nakano
### NO. 11 (1964)

1. **Die Kostenbegriffe für die betriebliche Planung**
   - Tetsuo Kobayashi

2. **Introducing Prof. Shinjo's "History of the Yen"**
   - Zentaro Matsumura

3. **Accounting Profit and Taxable Income**
   - Susumu Watanabe

4. **On Integration in Economic Accounting**
   - Nobuko Nose

5. **Über „Cost Accounting Standards“ in Japan**
   - Tetsuo Kobayashi

6. **A Note on the Lohmann-Ruchti Effect**
   - Isao Nakano

7. **Management Approach to Regional Development Problems in Japan**
   - Minoru Beika

8. **The Continuous Employment of Seamen in American Shipping Industry**
   - Hiromasa Yamamoto

   - Yoshiaki Nishimukai

### NO. 12 (1965)

1. **Special Depreciation and Reduced Entry**
   - Susumu Watanabe

2. **Electronic Data Processing System in Japan**
   - Minoru Beika

3. **A Chronological Table of Modern Japanese Shipping — No. 1; 1600 ~ 1799**
   - Sei'i Sasaki

4. **The Continuous Employment of Seamen in American Shipping Industry**
   - Hiromasa Yamamoto

5. **The Employment System of Seamen before World War II**
   - Yoshiaki Nishimukai

6. **On the Automation of Banking in Japan**
   - Jiro Ono

7. **International Liquidity and the Tokyo Meeting of the International Monetary Fund**
   - Masahiro Fujita

8. **Intersectoral Transaction Table with Endogenous Foreign Trade Sector in the Indian Economy: 1955/56**
   - Hikoji Katano

9. **The System of Reserved Members for Seamen before World War II**
   - Yoshiaki Nishimukai

### NO. 13 (1966)

1. **Annual Income under the Corporation Income Tax Law**
   - Susumu Watanabe

2. **Trade Controls in Occupied Japan (1945~1949)**
   - Fukuo Kawata

3. **Patterns of Domestic Shipping Services — Characteristics of Japanese Coastwise Shipping**
   - Sei'jii Sasaki

4. **Approaches to the History of Individual Business Units**
   - Tadahatsu Inoue

5. **Cumulated Cost Ratios for the Japanese Economy in 1955**
   - Nobuko Nose

6. **Accelerated Growth of National Income**
   - Hikoji Katano

7. **Technological Development and Labour Relations in the Japanese Shipping Industry**
   - Hiromasa Yamamoto

8. **Brazilian Position in the Latin American Free Trade Association**
   - Yoshiaki Nishimukai

9. **Information Specification for Business Management (I) — A Case Study**
   - Yoshiaki Nishimukai
NO. 14 (1967)

A Return on the Confirmed Settlement of Accounts
Susumu Watanabe

Problems of Regional Industrial Development
Relating to National Planning in Japan
Minoru Beika

The Development of Japanese Trade with the British
Commonwealth in Asia
Fukuco Kawata

On the Kihansen (Japanese Wooden Coastwise Vessels)
Seiiji Sasaki

Approaches to Company History
Tadakatsu Inoue

Cumulated Cost Ratios for the ECAFE Countries
Nobuko Nose

International Liquidity Controversy in Japan (1)
Masahiro Fujita

Investment Criterion for Maximizing the Rate of Capital Accumulation
Hikoji Katano

Peculiarities of Maritime Labor — with special reference to the Supply of Maritime Labor
Hiromasa Yamamoto

Los Estudios Del Brasil En El Japón
— Con Referencia a las Ciencias Sociales
Yoshiaki Nishimukai

NO. 15 (1968)

Characteristic Approach for Regional Development in Western Europe and U.S.A. — Relating to the Case in Japan
Minoru Beika

Export Patterns of Leading Industrial Countries
Fukuco Kawata

The Early Development of Kobe Port
Seiiji Sasaki

Rise of Modern Shipbuilding in Japan and Promoters
Tadakatsu Inoue

A Note on the Redistribution of Profits
Nobuko Nose

International Liquidity Controversy in Japan (2)
Masahiro Fujita

Factors to Determine the Relative Share: The Case of India
Hikoji Katano

Maintenance of Capital based on Earning Power
Jiro Ono

Recent Changes in Japan's Trade with Latin America and Brazil
Yoshiaki Nishimukai

Some Inventory Accounting Problems
Isao Nakano

Organizational Slack and Adaptive Behaviour in the Firm
Hideki Yoshihara
KOBE UNIVERSITY ECONOMIC REVIEW 1968

Edited by Faculty of Economics,
Kobe University, Kobe, Japan

CONTENTS

The Commercial Banking and Mixed Banking Principles in Japan.................Jiro Yao
Industrial Organization Policy and Economic Growth
in Postwar Japan ........................................Koujiro Niino
Two Models of Farm Problem in the Open System ....................Osamu Tanaka
The Impact of Changing Food Habits on Imports and
the Future Land Use Pattern in Japan ......................Tohru Ishimitu

Aid and Trade
— A Proposal for Integrated Assistance
Policy — ....................................................Atsushi Murakami

KOBE UNIVERSITY LAW REVIEW

International Edition 1966
Edited by Faculty of Law,
Kobe University, Kobe, Japan

CONTENTS

Seventy-years of Japanese Private International Law:
A Historical Review .....................................Taro Kawakami
Discovery in Japanese Criminal Procedure ..........................Shigetsugu Suzuki
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 "Juyo Keizai Tokei" monthly and "Sekai Boeki Tokei" 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 economy, business administration, and business mechanization in Japan.

LOCATION AND BUILDINGS

The Research Institute for Economics and Business Administration is located on the campus of Kobe University, Rokko, Kobe. It is a three-storied building 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, three conference rooms, etc. Adjoining is a one-story building recently built to install business machines.

ORGANIZATION

Under the directorship of the president, the Institute operates with two research groups, each has five sections respectively. Each research group and its sections are as follows:

A **Group of International Economy**
   1. International Trade
   2. Economy of Latin-America
   3. Maritime Economy
   4. International Finance
   5. International Law of Economy

B **Group of Business Administration**
   1. Business Administration and Business Mechanization
   2. Accounting
   3. International Management
   4. Business Statistics
   5. International Labor Problems

Besides the regular work of the Institute organized in this manner, research committees may be created to carry on any special work requiring the joint study of academic and business circles. At present, there are three committees, that is, the Finance Committee, Latin-America Committee, and International Economy Committee.

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 recently established. It is the first systematic information facility 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.
### GROUP OF INTERNATIONAL ECONOMIC RESEARCH

<table>
<thead>
<tr>
<th>Name</th>
<th>Position</th>
</tr>
</thead>
<tbody>
<tr>
<td>Fukuo Kawata</td>
<td>Professor of International Trade Dr. of Economics</td>
</tr>
<tr>
<td>Seiji Sasaki</td>
<td>Professor of Maritime Economy Dr. of Economics</td>
</tr>
<tr>
<td>Jiro Yao</td>
<td>Professor of International Finance Dr. of Economics</td>
</tr>
<tr>
<td>Masahiro Fujita</td>
<td>Professor of Regional Study on Latin America</td>
</tr>
<tr>
<td>Hikoji Katano</td>
<td>Associate Professor of International Trade</td>
</tr>
<tr>
<td>Hiromasa Yamamoto</td>
<td>Associate Professor of Maritime Economy</td>
</tr>
<tr>
<td>Yoshiaki Nishimukai</td>
<td>Associate Professor of Regional Study on Latin America</td>
</tr>
</tbody>
</table>

### GROUP OF BUSINESS ADMINISTRATION RESEARCH

<table>
<thead>
<tr>
<th>Name</th>
<th>Position</th>
</tr>
</thead>
<tbody>
<tr>
<td>Minoru Beika</td>
<td>Professor of Business Administration and Business Mechanization Dr. of Business Administration</td>
</tr>
<tr>
<td>Tadakatsu Inoue</td>
<td>Professor of International Management</td>
</tr>
<tr>
<td>Nobuko Nose</td>
<td>Professor of Accounting Dr. of Business Administration</td>
</tr>
<tr>
<td>Jiro Ono</td>
<td>Associate Professor of Business Administration and Business Mechanization</td>
</tr>
<tr>
<td>Isao Nakano</td>
<td>Associate Professor of Accounting</td>
</tr>
<tr>
<td>Hideki Yoshihara</td>
<td>Research Associate of International Management</td>
</tr>
</tbody>
</table>

Office: The Kanematsu Memorial Hall, THE KOBE UNIVERSITY ROKKO, KOBE, JAPAN