Commercial banks' participation in financing agriculture has increased both directly and indirectly after nationalization. In Madhya Pradesh the amount outstanding under direct financing to farmers by the Scheduled Commercial banks has increased from Rs. 203.5 lakhs in 1969 to Rs. 2906.8 lakhs in 1974. The number of borrowal accounts rose from 7431 to 77694 during this period. Similarly, the amount outstanding under indirect financing stood at Rs. 600.9 lakhs in 1974 as against Rs. 249.5 lakhs in 1969. Number of accounts went up to 34262 in 1974 which was only 231 in 1969.
Advances to agriculture by banks through direct and indirect sources are given in table No. LX.

Out of the total credit outstanding, the share of 14 nationalized banks was Rs. 1421.0 lakhs by the end of June, 1974, while the State Bank of India group contributed Rs. 786.2 lakhs. In terms of percentages, the former contributed 64 per cent and the latter 35 per cent of the total amount outstanding against agriculture. Bank group-wise position of outstanding credit to agriculture as on 30th June, 1974 is given in table No. LXI.

Growth of Advances:-

The average growth rate of agricultural advances has been pointed out as over 50 per cent from the date of nationalization of Banks. In order to encourage the banks to lend more money to the needy farmers, the lead banks scheme was formulated. According to the scheme the Central Bank of India has allotted seventeen districts and the State Bank of India has allotted Nine districts. Advances of these two banks for the period 1971 to 1975 are given in table No. LXII & LXIII. As far as Central Bank of India is concerned the amount advanced in lead districts increased from Rs. 17 lakhs to 488 lakhs during 1971 to 1975. The number of accounts increased from 906 in 1971
to 15278 in 1975. Their advances in Non-Lead districts which was Rs.61 lakhs in 1971 went up to Rs.208 lakhs in 1975. The number of accounts increased from 527 to 9134 during this period.

Total Agricultural advances by State Bank of India increased from Rs.24875 thousand in 1971 to Rs.90417 thousand in 1975. Number of accounts increased from 13593 to 35520 during this period.

I

Relationship between number of borrowal accounts and agricultural advances by nationalized banks:

An increase in the number of accounts followed by an increase in the amount advanced for agricultural purposes can be considered as a healthy sign of agricultural financing by nationalized banks. But an increase in the amount outstanding against agriculture by these banks need to be examined further. In this context it can be pointed out that the increase in the outstanding credit may be due to the poor recovery standards or/and an increase in the amount advanced to farmers. However, the amount outstanding is taken as a representative of advances since data regarding only for advances is not available. It is assumed that larger the outstandings greater will be the amount disbursed to farmers. It is therefore, intended to find out if a relationship exists between the two variables. In fact, a linear relationship is assumed
between number of accounts and the amount outstanding against agriculture.

Total number of accounts \((X)\) is assumed to be an independent variable and total outstanding credit \((Y)\) is taken as a dependent variable. Therefore the linear relationship between \(X\) & \(Y\) is expressed as \(^1\)

\[
Y = a + bX
\]

where \(a\) and \(b\) are the unknown parameters indicating the intercept and slope of the function.

On the basis of the linear relationship between the two variables \(X\) and \(Y\) (whose values are given below), the values of \(a\) and \(b\) are estimated, solving the following equations.

\[
\sum Y = Na + bX \quad ---(1)
\]
\[
\sum XY = aX + bX^2 \quad ---(2)
\]

where \(X = 364233\)

\(N = 6\)

\[
\sum Y = 9135.9
\]
\[
\sum X^2 = 2920503935
\]
\[
\sum XY = 713704898
\]

When these values are substituted in the equation

\(^1\) J. Johnston: Econometric Methods, P. 4.
the equations will be

\[ 9135.9 = 6a + b \quad 364233 \quad \ldots (1) \]
\[ 713704898 = a \quad 364233 + b \quad 29205030935 \quad \ldots (2) \]

i.e. \[ 364233a + 29205030935b = 713704898 \]
\[ 364233a + 22110946331b = 554540175 \]

\[ 7094084554 \quad b = 159164723 \]

\[ \therefore \quad b = .0224 \]

\[ \therefore \quad 6a = 9135 - 81588192 \]
\[ = + 976.1808 \]
\[ a = \frac{976.1808}{6} \]
\[ = 162.6968 \]

Therefore the regression equation of \( Y \) on \( X \) is

\[ \hat{Y} = 162.69 + .224 \quad (X) \]

On the basis of the estimated values of \( a \) and \( b \), the values of outstanding credit \( (Y) \) for given number of borrowal account \((X)\) were estimated.
The estimated values of Y for the given value of X as follows:

<table>
<thead>
<tr>
<th>Year</th>
<th>X (No. of accounts)</th>
<th>Y (amount outstanding)</th>
<th>( \hat{y} = a + bX )</th>
</tr>
</thead>
<tbody>
<tr>
<td>1969</td>
<td>7562</td>
<td>453.0</td>
<td>334.3</td>
</tr>
<tr>
<td>1970</td>
<td>37933</td>
<td>1034.9</td>
<td>1013.7</td>
</tr>
<tr>
<td>1971</td>
<td>44272</td>
<td>1174.5</td>
<td>1154.3</td>
</tr>
<tr>
<td>1972</td>
<td>76049</td>
<td>1463.5</td>
<td>1410.9</td>
</tr>
<tr>
<td>1973</td>
<td>84365</td>
<td>1993.1</td>
<td>2082.2</td>
</tr>
<tr>
<td>1974</td>
<td>111961</td>
<td>3007.9</td>
<td>2670.6</td>
</tr>
</tbody>
</table>

To test the hypothesis of no relationship between the given variables X and Y, F value is computed by using the analysis of variance method.  

\[
F = \frac{Q_1}{Q_2 / (n-2)}
\]

Where \( Q_1 = \sum \hat{y}_1^2 \)

Source: J. Johnston, p. 32.
\[ q_2 = \sum e_1^2 = \sum y_1^2 - \sum \hat{y}_1^2 \]

\[
\begin{bmatrix}
  y_1 \\
  \hat{y}
\end{bmatrix} = y - \bar{y}
\]

\[ \sum y_1^2 = 3928646 \]

\[ \sum \hat{y}_1^2 = 3555424 \]

\[ \sum e_1^2 = 373222 \]

Therefore \( q_1 = 3555424 \)

\[ q_2 = 373222 \]

The calculation is set out in the analysis-of-variance table as shown below:

<table>
<thead>
<tr>
<th>Source of Variation</th>
<th>Sum of squares</th>
<th>Degrees of freedom</th>
<th>Mean squares</th>
</tr>
</thead>
<tbody>
<tr>
<td>( X )</td>
<td>( q_1 = \sum \hat{y}_1^2 )</td>
<td>1</td>
<td>( \sum \hat{y}_1^2 )</td>
</tr>
<tr>
<td>Residual</td>
<td>( q_2 = \sum e_1^2 )</td>
<td>( n - 2 )</td>
<td>( \sum e_1^2/(n-2) )</td>
</tr>
<tr>
<td>Total</td>
<td>( \sum y^2 = q_1 + q_2 )</td>
<td>( n - 1 )</td>
<td></td>
</tr>
<tr>
<td>Source of Variance</td>
<td>Sum. of Squares</td>
<td>Degrees of freedom</td>
<td>Mean square</td>
</tr>
<tr>
<td>--------------------</td>
<td>-----------------</td>
<td>--------------------</td>
<td>-------------</td>
</tr>
<tr>
<td>X</td>
<td>35,55,424</td>
<td>1</td>
<td>35,55,424</td>
</tr>
<tr>
<td>Residual</td>
<td>3,73,222</td>
<td>4</td>
<td>93,305.8</td>
</tr>
<tr>
<td>Total</td>
<td>39,28,646</td>
<td>5</td>
<td></td>
</tr>
</tbody>
</table>

\[
F = \frac{3555424}{93305.8} = 38.10\text{ with 5 degrees of freedom.}
\]

For 5 degrees of freedom the table value of \( F_{0.01} \) is 21.02. On comparing the two \( F \) values, the hypothesis of no relation between the two variables \( X \) and \( Y \). Thus there is no evidence which rejects the relationship between the number of accounts and volume of outstanding credit. Further, the positive sign of the slop coefficient \( b \) shows a positive relationship between the number of accounts and the volume of advances.

The above analysis shows that an increase in the amount outstanding against agriculture by the banks is due to an increase in the number of borrowal accounts. It indicates that since
nationalization more farmers have been benefited through credit supply by the nationalized banks.

II

In this part an effort has been made to assess the role of nationalized banks in the sphere of agricultural lending. The analysis has been done on the basis of data regarding occupation-wise classification of outstanding credit, provided by the journal Banking Statistics, BSR, an RDI publication. Data for the 45 districts of Madhya Pradesh from 1972 to 1975 have been used for the purpose since such data is available for only that period.

In simple mathematical terms, the 'Share' of agriculture in the total credit outstanding of the state is the ratio of agricultural outstanding to the total outstanding credit. However, this concept is inadequate for certain important purposes. Firstly, it absolutely ignores the different statuses of the districts, both in the agricultural and total outstanding credit. Secondly, the concept is inadequate in the sense that it does not give any weight to the contribution of a particular district to the total agricultural outstanding of the state. Thirdly, a district which contributes a substantial proportion of the agricultural outstanding of the state may be poorly placed when the total outstanding credit of the district is also taken into
account. That is, the proportion of agricultural outstandings of a district to the total agricultural outstandings of the state will be greater than the proportion of agricultural outstandings to the total credit outstandings of the districts. In this case the total outstanding credit in a particular district may exceed the total agricultural outstandings of the state. For example, in 1972 the total outstanding credit in Indore is greater than the total agricultural outstandings of the state as a whole. On the other hand, districts with meagre share in the total agricultural outstandings, in certain cases, may rank high when the total outstanding credit of the district is also taken into consideration.

Taking all these aspects into consideration the concept of the "district-weighted share" can be employed here in order to find out the share of agriculture in the total outstanding credit of the state. Thus the object is to find out the share of agriculture in the total outstanding credit of each district instead of what is its share in the total outstanding credit. An overall index for the state as a whole is derived by weighting these individual shares into a single average, by weighting each of them according to the importance of the district in

* The concept of "Weighted Share" is taken from Michael Michaeley's book "concentration in...

...cont.
the total agricultural outstandings of the state.

Symbolically the "district-weighted share" of agricultural outstandings of the state is denoted by

\[ W_{jx} = 100 \sum_{i=1}^{n} \left[ \frac{X_{ij}}{X_i} \cdot \frac{X_{ij}}{X_j} \right] \]

where for any given period \( X_{ij} \) stands for outstanding credit against agriculture in \( i \)th district, \( X_i \) denotes total credit outstandings in the same district and \( X_j \) stands for total agricultural outstandings of the state. This index of "district-weighted share" is used to measure the share of agriculture in the total credit outstandings of Madhya Pradesh.

The upper limit of this index is 100 and the lower limit is the simple total ratio of agricultural outstandings to the total outstanding credit. In the former case, agricultural outstandings constitute sole of the total outstanding credit of each district. The lower level is reached when the agricultural outstandings of the state is distributed among various districts in exactly the same proportion as the total credit outstandings of the district.

International Trade*. The author has used the concept of "Commodity-weighted share" to find out a country's share in the total world exports and imports. (Refer page 27 of the book.)
The index of 'district-weighted share' of agriculture in total outstanding credit reflects three basic factors. In the first place it indicates the simple ratio of agriculture outstandings to the total outstanding credit. Secondly it denotes the regional concentration of agricultural credit outstandings. (In this case a district is considered as a region.) Thirdly, the index is affected by the extent to which agricultural outstandings concentrate have a large or smaller proportion in the total outstanding credit. The larger the outstandings against agriculture, the more the regional concentration and the smaller the total credit outstandings in these districts in which the agriculture credit has concentrated the higher the 'district-weighted share' of agriculture outstandings in the total outstanding credit.

The indexes of 'district-weighted share' of agriculture in the total outstanding credit thus computed is given in Appendix. To have a clear understanding, the simple share of each district in the total agriculture outstandings and in respective of their total credit outstandings have given separately.

The 'share' of agricultural outstandings in the total outstanding credit is, therefore, found
21.55 in 1972, 26.78 in 1973, 29.09 in 1974 and 34.62 in 1975. The contribution of each district in the total 'share' is shown in table No. LXIV.

According to the table districts like Raisen, Raipur, Hoshangabad, Chhatarpur, Narsinghpur, Seoni, Vidisha and Mandsaur have contributed substantial part to the total 'share' of agricultural outstandings in all the years under consideration. The lowest contributors are Sidhi, Shahdol, Gwalior, Mandla, Panna, Raigarh, Rewa and Morena. In 1972 Raipur, Raisen and Seoni have ranked for the higher proportion while Shivapuri, Sidhi and Shahdol have zero share to contribute. In the year 1973, Raisen, Raipur and Mandsaur ranked the top when Sidhi and Panna have zero share. Again, in 1974 Raisen contributed the biggest part followed by Narsinghpur, Hoshangabad and Chhatarpur. Districts like Sidhi, Shahdol and Gwalior were the lowest contributors and their position has remained more or less same in 1975. During the year Hoshangabad have contributed the major share followed by Chhatarpur and Vidisha.

In this respect it is significant to note that the contribution of a district to the 'share' of agriculture outstanding in the total outstanding credit has been influenced by two factors. (1) the proportion of the agricultural outstandings to the total outstanding credit in a district and
(2) the proportion of agricultural outstandings to the total agricultural outstandings of the state. The effect of these two factors on the contribution of a district to the total 'share' is evident from the appendix tables A, B, C and D. The greater the proportion of agricultural outstanding to the total outstanding credit in a district and to the total agricultural outstandings of the State, the higher will be the contribution of a district to the total 'share' of agriculture outstandings in the total Bank credit. In other words, regional concentration is one of the factors which influences the 'share' of agriculture in the total bank credit. In this context it should be recalled that regional concentration is one of the factors which reflects in the 'District-weighted share' concept. Therefore, coefficient of variation is used here in order to compare the degree of concentration or the relative dispersal of agricultural credit among the districts over a period of time.

Coefficient of Variation is defined as

\[ v = \frac{\sigma}{\bar{x}} \times 100 \]
Accordingly the coefficient of Variation is calculated and is given below. In order to get a clear understanding, the 'District-weighted share' indices for the respective years are also given.

<table>
<thead>
<tr>
<th></th>
<th></th>
<th></th>
<th></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>W_{xj}</td>
<td>21.55</td>
<td>26.78</td>
<td>29.09</td>
<td>34.52</td>
</tr>
<tr>
<td>V</td>
<td>142.44</td>
<td>136.49</td>
<td>107.10</td>
<td>105.09</td>
</tr>
</tbody>
</table>

It is obvious from the above values that the value of the Coefficient of Variation is higher in the year 1972 indicating a greater degree of regional concentration in agricultural outstanding credit. In fact, the uneven dispersal of agricultural credit among the districts was highest in 1972. In 1973, the 'Share' of agricultural outstandings has increased to 26.78 against 21.55 in 1972, while the Coefficient of Variation has decreased from 142.44 to 136.49. Thus an increase in the 'Share' of agricultural outstandings followed by a more or less proportionate decrease in the Coefficient of Variation shows that further concentration in the credit outstandings among the
regions has been checked. However, the degree of concentration has not been reduced considerably because the contribution of a few districts to the total 'share' of agricultural outstandings was remarkably higher during the year (see table LXIV.) In the year 1975, the value of the coefficient has steeply declined to 107.10, with a slight increase in the 'share' of agricultural outstandings. It indicates that the degree of concentration has diminished or the relative dispersal of agricultural credit among the districts was more uniform during the year. However, in 1975 an increase in the 'Share' of agricultural credit outstandings (34.52) has not followed by a proportionate decrease in the value of coefficient of variation (105.09). Therefore, it is significant to note that the increased 'Share' of agriculture in the total bank credit was due to concentration of outstanding credit in certain regions. It indicates an increase in the 'Share' of agricultural outstanding credit has unevenly distributed among the districts.

The foregoing analysis reveals the fact that the 'share' of agricultural credit in the total outstanding credit has increased over a period of time. However, this phenomenon was not the result of a more uniform dispersal of credit among the districts.
of Madhya Pradesh. On the other hand, credit has concentrated in certain regions.