ANNEXURE II
TERM LENDING PERFORMANCE OF HSIDC

An attempt has been made in this section to evaluate the term lending performance of HSIDC with respect to IDBI's Normal and Equipment Refinance Scheme in terms of the following ten variables:

i. Total assistance sanctioned
ii. Total assistance disbursed
iii. Assistance sanctioned to backward areas
iv. Assistance disbursed to backward areas
v. Total investment made
vi. Total employment potential
vii. Total expected sales
viii. Investment made in backward areas
ix. Employment potential in backward areas
x. Expected sales in backward areas

The broad analytical framework of this analysis is based on the hypothesis that the performance of HSIDC has improved through time.

The input data on term lending performance of the Normal and Equipment Refinance Scheme over 11 years from 1978-79 to 1988-89 is given in Table A.II-1.

In order to capture the trend precisely, these ten variables have been regressed on time. Best fit have been chosen for each variable on the basis of coefficient of
### TABLE A.II-1: TERM LENDING PERFORMANCE OF HSIDC UNDER IDBI'S NORMAL AND EQUIPMENT REFINANCE SCHEME

<table>
<thead>
<tr>
<th>Year</th>
<th>Amount sanctioned</th>
<th></th>
<th>Amount disbursed</th>
<th></th>
</tr>
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<tbody>
<tr>
<td></td>
<td>Backward Area</td>
<td>Non-backward Area</td>
<td>Total</td>
<td>Backward Area</td>
</tr>
<tr>
<td>1978-79</td>
<td>-</td>
<td>4.50</td>
<td>4.50</td>
<td>-</td>
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<tr>
<td>1979-80</td>
<td>131.00</td>
<td>128.79</td>
<td>259.79</td>
<td>-</td>
</tr>
<tr>
<td>1980-81</td>
<td>142.00</td>
<td>178.00</td>
<td>320.00</td>
<td>84.00</td>
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<tr>
<td>1981-82</td>
<td>227.35</td>
<td>445.80</td>
<td>673.15</td>
<td>101.68</td>
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<td>1982-83</td>
<td>366.67</td>
<td>397.82</td>
<td>764.49</td>
<td>89.75</td>
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<td>1983-84</td>
<td>275.25</td>
<td>343.25</td>
<td>618.50</td>
<td>247.54</td>
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<tr>
<td>1984-85</td>
<td>385.91</td>
<td>148.93</td>
<td>534.34</td>
<td>239.23</td>
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<tr>
<td>1985-86</td>
<td>327.80</td>
<td>427.00</td>
<td>754.80</td>
<td>313.00</td>
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<td>1986-87</td>
<td>477.42</td>
<td>350.22</td>
<td>827.64</td>
<td>287.98</td>
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<tr>
<td>1987-88</td>
<td>640.64</td>
<td>206.55</td>
<td>847.19</td>
<td>279.34</td>
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<tr>
<td>1988-89</td>
<td>534.53</td>
<td>371.99</td>
<td>906.52</td>
<td>514.39</td>
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</table>

<table>
<thead>
<tr>
<th>Year</th>
<th>Investments</th>
<th>Employment Potential</th>
<th>Expected sales</th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Backward Area</td>
<td>Non-backward Area</td>
<td>Total</td>
<td>Backward Area</td>
</tr>
<tr>
<td>1978-79</td>
<td>-</td>
<td>63.44</td>
<td>63.44</td>
<td>-</td>
</tr>
<tr>
<td>1979-80</td>
<td>307.13</td>
<td>307.73</td>
<td>614.86</td>
<td>618</td>
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<tr>
<td>1980-81</td>
<td>390.35</td>
<td>372.27</td>
<td>762.62</td>
<td>303</td>
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<tr>
<td>1981-82</td>
<td>491.53</td>
<td>1214.14</td>
<td>1705.67</td>
<td>714</td>
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<tr>
<td>1982-83</td>
<td>906.83</td>
<td>1054.00</td>
<td>1960.83</td>
<td>1203</td>
</tr>
<tr>
<td>1983-84</td>
<td>803.20</td>
<td>896.82</td>
<td>1699.82</td>
<td>757</td>
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<tr>
<td>1984-85</td>
<td>788.28</td>
<td>395.02</td>
<td>1183.30</td>
<td>788</td>
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<tr>
<td>1985-86</td>
<td>898.32</td>
<td>950.51</td>
<td>1848.83</td>
<td>764</td>
</tr>
<tr>
<td>1986-87</td>
<td>1231.20</td>
<td>699.63</td>
<td>1930.83</td>
<td>900</td>
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<tr>
<td>1987-88</td>
<td>1434.55</td>
<td>246.65</td>
<td>1681.20</td>
<td>725</td>
</tr>
<tr>
<td>1988-89</td>
<td>1626.55</td>
<td>805.06</td>
<td>2431.61</td>
<td>631</td>
</tr>
</tbody>
</table>

Note: *nt/Investment expected Sales expressed in Rs. lakhs.*
determination criterion out of the following five models:

(i) \( Y = a + bx \); (ii) \( 2Y = a + bx + cx^2 \);
(iii) \( \ln Y = a + bx \); (iv) \( \ln Y = a + b \ln X \);
(v) \( Y = a + b \ln X \).

Each variable will be discussed in detail.

A-II.1 Total assistance sanctioned

The best fitted model for total assistance sanctioned by HSIDC is,

\( Y = a + b \ln X \),
\( Y = 19.83762 + 359.56436 \ln X \)
\( R^2 = 0.8798 \)

S.E. (a) = 125.9785
S.E. (b) = 44.3093

The \( R^2 \) value shows that the model explains 88% of the variations in the amount sanctioned over the period. The standard error of regression coefficient (b) is 44.3093 resulting into a significant value at 1% level of significance. The trend curve is depicted on Graph A.II-1 along with actual observation.

The observations closely follow the trend during 1978-79 to 1979-80, and 1985-86 to 1988-89. However, there are wide downswings and upswings between 1979-80 to 1985-86. On the basis of this trend curve, the forecasts for 1989-90 and 1990-91 are Rs. 913.32 lakhs and Rs. 942.12 lakhs respectively.
GRAPH A.II - 1: TREND SHOWING TOTAL AMOUNT OF ASSISTANCE SANCTIONED
BY HSIDC

Equation

\[ Y = 19.83762 + 359.56436 \ln X \]
A-II.2  **Total assistance disbursed**

The best fitted model for total assistance disbursed by HSIDC is,

\[ Y = a + bx + cx^2 \]

\[ Y = -34.53 + 65.53 X - 0.7162 X^2 \]

\[ R^2 = 0.9049 \]

S.E. (a) = 87.0369  
S.E. (b) = 28.8064  
S.E. (c) = 2.3380

The \( R^2 \) value shows that the model explains 90.49% of the variations in the amount disbursed over the period. The standard error of regression coefficient (b) is 28.8064 resulting into a significant value at 5% level of significance. The model is depicted on Graph A.II-2 along with the values of assistance disbursed. It shows almost regular fluctuations around the trend curve. The forecast on the basis of trend curve for the year 1989-90 and 1990-91 are Rs. 648.70 lakhs and Rs. 696.32 lakhs.

A-II.3  **Assistance sanctioned to backward areas**

The best fitted model for assistance sanctioned to backward areas by HSIDC is,

\[ \ln Y = a + b \ln x \]

\[ \ln Y = 4.1553 + 0.9077 \ln X \]

\[ R^2 = 0.8938 \]

S.E. (a) = 0.2671  
S.E. (b) = 0.1106
GRAPH A.II - 2: TREND SHOWING TOTAL AMOUNT OF ASSISTANCE DISBURSED BY HSIDC

Equation

\[ y = -34.53 + 85.53 \times -0.7162 \times^2 \]
The $R^2$ value shows that the model explains 89.38% of the variations in the amount sanctioned to backward areas over 10 years. The value of regression coefficient ($b$) is found to be 0.9077. The standard error of regression coefficient is 0.1106 resulting into a significant $t$ value at 1% level of significance. The model is depicted on Graph A.II-3 along with its ln values of assistance sanctioned to backward areas. There are upswings and downswings around the trend line. On the basis of this trend curve, the forecasts for 1989-90 and 1990-91 are Rs. 608.41 lakhs and Rs. 654.29 lakhs respectively.

A-II.4 Assistance disbursed to backward areas

The best fitted model for assistance disbursed to backward area is,

\[ Y = a + bx + cx^2 \]

\[ Y = -49.301 + 36.268 X + 0.7105 X^2 \]

\[ R^2 = 0.8781 \]

S.E. (a) = 78.7453
S.E. (b) = 26.0621
S.E. (c) = 2.1153

The $R^2$ value shows that the model explains 87.81% of the variations in the amount disbursed over the period. The standard error of regression coefficient (b) is 26.0621 resulting into a significant $t$ value at 20% level of significance. The model is depicted on Graph A.II-4 along
GRAPH A.II - 3 : TREND SHOWING TOTAL AMOUNT OF ASSISTANCE SANCTIONED TO BACKWARD AREAS BY HSIDC

Equation

\[ \ln Y = 4.1553 + 0.9077 \ln X \]
GRAPH A.II - 4: TREND SHOWING TOTAL AMOUNT OF ASSISTANCE DISBURSED TO BACKWARD AREAS BY HSIDC

Equation

\[ Y = -49.301 + 38.268X + 0.7105X^2 \]
with values of assistance disbursed to backward areas. The graph shows upswings and downswings around the trend line. The forecasts on the basis of trend curve for 1989-90 and 1990-91 are Rs. 488.23 lakhs and Rs. 542.26 lakhs respectively.

A-II.5 Total investment made

The best fitted model for total investment made is,

\[ Y = a + b \ln X \]

\[ Y = 111.3317 + 837.51 \ln X \]

\[ R^2 = 0.7853 \]

S.E. (a) = 415.0805
S.E. (b) = 145.9927

The \( R^2 \) value shows that the model explains 78.53% of the variations in the amount of total investments made over the period. The standard error of regression coefficient (b) is 145.9927 resulting into a significant t value at 1% level of significance. The model is depicted on Graph A.II-5. The observations closely follow the trend during the period 1978-79 to 1979-80 and 1985-86 to 1986-87. However, there are wide downswings and upswings from 1979-80 to 1985-86 and from 1986-87 to 1988-89. The forecasts on the basis of the trend curve for 1989-90 and 1990-91 are Rs. 2192.46 lakhs and Rs. 2259.55 lakhs respectively.
GRAPH A.II - 5  TREND SHOWING TOTAL INVESTMENT MADE OF PROJECTS ASSISTED BY WAY OF TERM LOANS FROM HSIDC

Equation

\[ Y = 111.3917 + 0.3751 \ln X \]
A-II.6  Total employment potential

The best fitted model for total employment potential is,

\[ Y = a + bx + cx^2 \]
\[ Y = -228.236 + 665.5755X - 53.2063X^2 \]

\[ R^2 = 0.4620 \]

S.E. (a) = 766.3383
S.E. (b) = 253.6332
S.E. (c) = 20.5859

The \( R^2 \) value shows that the model explains 46.20% of the variations in the total employment potential over the period. The standard error of regression coefficient (b) is 253.6332 resulting into a significant t value at 1% level of significance. The model is depicted on Graph A.II-6. The trend takes the shape of a cycle around which there are wide upswings and downswings. The model cannot be used for forecasting in view of a low \( R^2 \) value.

A-II.7  Total expected sales

The best fitted model for total amount of expected sales of projects assisted by HSIDC under IDBI's Normal and Equipment Refinance scheme is,

\[ \ln Y = a + b \ln X \]
\[ \ln Y = 5.1922 + 1.8422 \ln X \]

\[ R^2 = 0.7504 \]

S.E. (a) = 10.0691
S.E. (b) = 0.3542
GRAPH A.II - 6 TREND SHOWING TOTAL EMPLOYMENT POTENTIAL OF PROJECTS ASSISTED BY WAY OF TERM LOANS FROM HSIDC

Equation

\[ Y = -228.236 + 663.5756 X - 53.2063 X^2 \]
The $R^2$ value shows that the model explains 75.04% of the variations in the amount of expected sales generated over 11 years. The value of regression coefficient ($b$) is found to be 1.8422 showing the time elasticity of amount of expected sales. The standard error of regression coefficient is 0.3542 resulting in a significant t value at 1% level of significance. The model is depicted on Graph A.II-7 along with ln values of expected sales. It shows upswings and downswings around the trend line except from 1985-86 to 1986-87 during which period the observations were closer to the trend. The forecasts for 1989-90 and 1990-91 are Rs. 17498.72 lakhs and Rs. 20281.07 lakhs respectively.

A-II.8 Investment made in backward areas

The best fitted model for the amount of investments made in backward area is,

$$Y = a + bx + cx^2$$

$$Y = -9.5305 + 121.8086 X + 1.864 \times X^2$$

$$R^2 = 0.9390$$

S.E. (a) = 173.2241
S.E. (b) = 57.3316
S.E. (c) = 4.6533

The $R$ value shows that the model explains 93.90% of the variations in the amount of investments made in backward areas over the period. The standard error of regression coefficient ($b$) is 57.3316 resulting into a
Graph A.II - 7 Trend showing total expected sales of projects assisted by way of term loans from HSIDC

Equation

\[ \ln y = 5.1922 + 1.9422 \ln x \]
significant t value at 10% level of significance. The model is depicted on Graph A.II-8. The observations closely follow the trend from 1978-79 to 1981-82 and from 1986-87 to 1988-89. However, it takes the shape of a cycle between the period 1981-82 to 1986-87. The forecasts on the basis of trend curve for the year 1989-90 and 1990-91 are Rs. 1720.59 lakhs and Rs. 1889.00 lakhs respectively.

A-II.9 Employment potential in backward areas

The best fitted model for employment potential in backward areas is,

\[ Y = a + bx + cx^2 \]

\[ Y = -149.52 + 298.2566 X -21.02 X^2 \]

\[ R^2 = 0.6373 \]

S.E. (a) = 265.1213
S.E. (b) = 87.7466
S.E. (c) = 7.1219

The \( R^2 \) value shows that the model explains 63.73% of the variations in the employment potential in backward areas over the period. The standard error of regression coefficient (b) is 87.7466 resulting into a significant t value at 1% level of significance. The model is depicted on Graph A.II-9. The trend takes the shape of a cycle. There are wide upswings and downswings around the cycle except from 1986-87 to 1988-89 during which period observations
GRAPH A.II - TRENDS SHOWING INVESTMENT MADE IN BACKWARD AREAS OF PROJECTS ASSISTED BY WAY OF TERM LOANS FROM HSIDC

Equation:

\[ y = 9.535 + 1.2180x + 1.84x^2 \]

TIME

1978-79 79-80 80-81 81-82 82-83 83-84 84-85 85-86 86-87 87-88 88-89

TOTAL INVESTMENT (THOUSAND)
GRAPH A.II - 9  TREND SHOWING EMPLOYMENT POTENTIAL IN BACKWARD AREAS
OF PROJECTS ASSISTED BY WAY OF TERM LOANS FROM HSIDC

Equation

\[ y = -149.52 + 208.2566x - 21.02x^2 \]
appear quite closer to the trend. The forecasts on the basis of trend curve for the year 1989-90 and 1990-91 are 403 persons and 175 persons respectively.

A-II.10 Expected sales in backward areas

The best fitted model for the amount of expected sales in backward area is,

\[ \ln Y = a + b \ln X \]

\[ \ln Y = 5.2027 + 1.5751 \ln X \]

\[ R^2 = 0.7133 \]

S.E. (a) = 0.8525
S.E. (b) = 0.3530

The \( R^2 \) value shows that the model explains 71.33% of the variations in the amount of expected sales generated in backward areas over the ten years. The value of regression coefficient (b) is found to be 1.5751 showing the time elasticity of expected sales in backward areas. The standard error of regression coefficient (b) is 0.3530 resulting in a significant t value at 1% level of significance. The model is depicted on Graph A.II-10 along with ln values of expected sales in backward areas. There are wide downswings and upswings during the period around the trend line. The forecasts on the basis of trend line for 1989-90 and 1990-91 are Rs. 9105.79 lakhs and Rs. 10330.25 lakhs respectively.
Graph A.II -10 Trend showing expected sales in backward areas of projects assisted by way of term loans from HSIDC.