APPENDIX II

Detailed Methodology

The Economic Freedom Index (EFI) has been calculated for 20 states of India. Ideally, all 28 states and 7 union territories should have been included; however, data unavailability prevented this. As a result only those states and union territories are included, for which data were available for most of the variables that are used to construct the index. No imputations were made.

Further, many variables that would have found a suitable place in this index could not be included as data were not available for many states. Eventually 21 variables covering diverse aspects of economic freedom in different areas were utilised to arrive at the composite freedom index. There were a few variables for which data were not available for some of the 20 states. However, since the indicator was essential for the credibility of the index, such indicators were retained.

There are many different ways of constructing a composite index. One way of doing this is to assign subjective weights to different variables. However, in order to ensure objectivity, this ranking refrains from such an exercise. No subjective weights have been used and as a result each variable is considered to be equally important.

The following steps were followed in constructing the index:

- Identifying the appropriate variables: The variables in the freedom index were chosen to enable a comprehensive view of economic freedom which could be obtained while working within the constraints of data availability.
- Normalising the variables: Indian states vary in geographical area, topography, social and economic milieu. Depending on the variable and what it aspires to measure, each variable has been appropriately 'normalised'.
- Comparability of data: Since data is collected at the state level, care has to be taken to ensure that the data are defined in the same way for different states and also that they are for the same time-point. Further, since the ranking exercise implies that higher values reflect better performance, appropriate ratios have been developed. Often this implied taking an inverse of a particular indicator or subtracting a percentage from 100.
- Creating an index of each variable: While the composite freedom index gives an overall view of freedom, it may be that while a state performs extremely well in certain indicators, its performance may not be as satisfactory in others. An index of each variable or indicator is also constructed, so that a ranking of the states is available for a detailed understanding of the situation of freedom. Details of the construction of individual indices are presented as follows:

- Creating a composite freedom index for each category: The simple arithmetic mean was used to calculate the category indices.
- Calculating a composite/overall index: This final step required all three category indices to be aggregated to arrive at a composite indicator of relative economic freedom for 20 states.

The last three steps in constructing the EFI are now explained in detail.

Creating an index of each variable: An index is obtained for each of the ratios as mentioned earlier. The following formula was used to obtain each of the indices:

$$I_{ij} = \frac{S_{ij} - \text{Min}(S_{1j}, S_{2j}, \ldots, S_{20j})}{\text{Max}(S_{1j}, S_{2j}, \ldots, S_{20j}) - \text{Min}(S_{1j}, S_{2j}, \ldots, S_{20j})}$$

Where S_{ij} represents the value of ratio j for state i. The index is constructed for 20 states of India and therefore i ranges from 1 to 21. There are 21 ratios for which the indices have been constructed, j=1,2,...21. I_{ij} is the index value that is derived for state i over ratio j. The index value lies between 0 to 1 for each ratio. The state corresponding to index value 0 can be interpreted as having the lowest level of economic freedom and the state with index value of 1 can be said to have the highest level of economic freedom relative to other states.

Note that the maximum and minimum values are the same as those used for earlier years, this ensures that the index values are comparable over time.

Creating a composite index for each category: Arithmetic mean was used to calculate the category index as follows:

$$C_{ik} = \frac{\sum_{j}^{n} I_{ijk}}{n}$$

Where C_{ik} is the category index of the i^{th} state for the k^{th} category over n indices within the category.

Calculating a composite/overall index: Once all the indices for the 24 ratios were obtained, a composite index was obtained using all these indices. An arithmetic mean of all the indices helped to arrive at the additive index. The formula used to calculate the composite index is as follows:

$$M_i = \frac{\sum_{k=1}^{N} C_{ik}}{N}$$

Where M_i is the additive index value for the i^{th} state over the N category indices of freedom. Here N is 3.