





ECONOMIC ENVIRONMENT INDEX

Measuring the Enabling Environment for Households and Firms at District Level



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The detailed district profiles for all the indicators and their respective sub-indicators along with the SPSS output of results can be accessed from our website www.economicgovernance.com. The district profiles come as spider graphs for all parameters within each indicator.

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Executive Summary

The Economic Environment Index (EEI) study in the state of Tamil Nadu, India comes in the wake of the recognition to foster inclusive growth through a decentralised planning process. Such recognition inherently implies the existence of regional diversity that may not be visible in state level analyses. Often, we find that in districts and small towns beyond the metros, ability of firms and households to maximise their economic benefits is constrained by local factors that constitute the economic environment. Therefore, improving the economic environment available at the regional level for firms and households – the ultimate economic constituents to whom governmental schemes are targeted – can help them leverage their existing resources and benefit from the government programmes for their economic growth.

However, such an effort to strengthen the local economic environment has to first start with an understanding of local needs and aspirations and the gaps that act as constraints for the economic environment at the regional level. EEI helps to identify and facilitate an understanding of such constraints to private sector development and economic growth, and thus assists both private and public sectors in their efforts to improve the business environment at the local level.

While there have been similar studies in India and other developing countries, we have made two changes that make this a unique and first of its kind study. First, this is a district level study, in all the districts of Tamil Nadu, except Chennai and three new districts, as against the usual practise of studying the state as a whole or the principal city (usually the capital city) of the state. Second, this study surveys both the firms and households, in contrast to the normal practise of surveying only the firms, thereby making this as a more complete voice reflecting the local aspirations.

The comparative measure of economic environment at the district level for the state of Tamil Nadu is based on seven sub-indices: 1. Physical Infrastructure, 2. Social Infrastructure, 3. Governance, 4. Law and Order, 5. Environmental Sustainability, 6. Business Establishment Cost and, 7. Cost of Doing Business. There are two kinds of data used for construction of EEI – published data on access for governance services (secondary sources) and primary data from surveys across the districts to determine quality of economic environment. Weights to these indices and sub-indices are assigned by a methodology called "Principal Component Analysis", in which the weights are determined according the variance observed in the data in each parameter to be weighed. However, we recognize that opinion could differ on assigning weights and this opinion is subject to the type of user group. Therefore, we are creating a website for EEI in which users could assign the weights according to their opinion on the relative importance of different parameters and view the results.

The study did bring out a number of positive aspects of economic environment from the field: the provision of rice at Rs. 1/- per kg, provision of essential food items as a package for low price, and the village level water tank construction were some of the measures that had uniform appeal across the state. Also, specific schemes such as the Vaazhndhu Kaattuvom scheme at select districts for economic empowerment of women have also been welcomed. However, our focus in this study is to bring out issues that constraints the economic environment for the firms and households at the district level, which could be addressed through better planning of delivery, taking also into account the contributions of the officials at the local bodies, and an increased knowledge of local needs.

One important factor to be remembered before discussing the results is the fact that a low score, as reflected in EEI, could be indicative of rapid development or other pressures on government services. A case in point is Kancheepuram, which is ranked 8th in overall EEI, though it is forefront in the state, and even in the country in attracting large investments. The district ranks relatively higher - for such huge investments - in cost of doing business, law and order, and governance, compared to other districts. This implies the success by the local government in handling these issues in spite of the large investments that it attracts and the pressures these investments generate on constant management. However, two components pull this district down in overall rank, namely, perceived access and quality of physical infrastructure and social

infrastructure, which could be indicative of the pressure on such services, created by the huge investments.

Therefore, the ranks have to be noted in the relative context of the district is inherent economic strengths and weaknesses. It is also important to note that each of the districts have some elements in which they are ranked high, and some elements in which they are ranked low. Ultimately, the ranks are dependent on the weights.

Of the districts ranked, the Nilgiris is ranked on the top. This district is followed by Namakkal. Both these districts find high ranks across all segments, except in the case of environmental sustainability, in which Namakkal district is ranked considerably lower.

The study reveals considerable district level variance in various parameters used in the construction of EEI. In the current context and the overall objective of this study, we recommend that this study be used to identify and target key governance gaps specific to the district. EEI can be a factor to consider in developing the District Development Plan as advocated by the Planning Commission of India, which calls for a more decentralised approach from the planning stage. It is also to be noted that disparities do indicate that there are some districts that perform better and that the best practices from these districts can be applied elsewhere. Finally, EEI could be used a tool to strengthen local entrepreneurship, by removing the constraints in the economic environment and by strengthening the driving factors.

1. Introduction

"Good governance is perhaps the single most important factor in eradicating poverty and promoting development."

- Mr. Kofi Annan

Former General Secretary, UNO

Economies do not operate in a vacuum. They function within the given socio-political framework of a region and the economic environment that this system provides. While this economic environment develops over a period of time, the direction and pace of change, and ultimately the economic experience within this environment is largely determined by governance. Research has shown that governance plays a determining role in enabling economic agents (firms and households) to optimise their wealth and this has strengthened the case for measuring the reach of governance efforts to the constituents of economy. There have been successful studies in measuring economic environment at sub-national levels in other countries, notably the studies by the Asia Foundation in various countries including Indonesia, the Philippines, Vietnam, Cambodia, and recently in Sri Lanka, where the index was termed as "Economic Governance Index" (EGI), wherein the focus was to measure the level of governance and reveal the gaps in governance.

The Economic Environment Index (EEI) by the Centre for Development Finance (CDF), in partnership with the Centre for Monitoring Indian Economy and in association with the Confederation of Indian Industry – Tamil Nadu Chapter, comes as a first of its kind effort in India on two counts:

First, this study is at the district level for all districts of a state – Generally, such studies have focused on the regional level – country or the state¹; and at the sub-regional level, they have focused on the capital city of the state². However, in India, a need to study district level economic environment requirements has already been recognised. In particular, the Planning Commission of India has taken cognisance of the need for decentralised planning process at the district level and further at the panchayat level in the Eleventh Five Year Plan, and has released a "District Planning Manual" to help this process. This manual succinctly observes the importance of taking into account "…resources locally available, infrastructure status and gaps, the aims and vision of the local people and weighing options of lead sectors…" to foster inclusive growth. It also calls

For instance, Bibek Debroy and Laveesh Bhandari, Economic Freedom for States of India, 2005

² For instance, Investment Climate and Competitiveness: A Study of 1,099 Manufacturing Companies, World Bank and Confederation of Indian Industries, 2002

for an enhanced level of transparency at all levels, that would not only help in understanding the disparities between the living standards of people but also enable equitable and humane planning³.

Second, this is a study of both the household and the business sectors in the districts — almost invariably, similar studies, including the successful ones highlighted earlier, strive to reflect the views of the businesses; other studies focused on households are generally the human development indices concentrating mostly on outcomes such as per capita income and life-expectancy, which are important in their own ways. However, households are important constituent of the economy at whom much of the governance programmes are directly targeted to improve their economic wellbeing.

It is common to find district-level variances in economic performance and in the socio-economic indicators within states. This diversity in delivery and outcomes necessitates that the study of EEI in India be at the district level. In India, the planning and policy parts of the economic environment are vested with the Central and State governments, while the principal responsibility of delivery rests with the district administrations. Thus, EEI, for the first time in India, has facilitated measurement of the enabling

environment for households and private enterprise at the district level. This study undertaken in the state of Tamil Nadu is a pilot study as we believe that we would have significant learning from this experience to take this effort forward in the state during the coming years and also in other states.

This report details EEI study undertaken by the CDF. The British High Commission (BHC) has provided the grants for this project under its Economic Governance Programme, based on a detailed proposal outlining the research methodology and the objective of this study, submitted by the CDF, seeking grants for executing this project. CDF entered into a partnership with the Centre for Monitoring Indian Economy (CMIE) for executing the sampling design and the sample survey across the districts. CDF also entered into a partnership with the Confederation of Indian Industry (CII) – Tamil Nadu Chapter to ensure significant stakeholder inputs into the study. While the study was undertaken in all the districts of Tamil Nadu, the results are presented for 28 districts. Chennai has been excluded from the study, for reasons enumerated in subsequent chapters. Tiruppur, Krishnagiri and Ariyalur were treated within their respective parent districts, namely Coimbatore, Dharmapuri and Perambalur.

³ Manual for Integrated District Planning, Planning Commission of India, November 2008

2. Tamil Nadu — A Background Note

Tamil Nadu is amongst the more industrialised states of India and a leader in attracting new investments in different sectors. The state is a strong player in all the three segments – agriculture, industry and services. Tamil Nadu is known for its diverse set of economic activities spread across the state – automobiles, auto-ancillaries, textiles, chemicals, electronics and software, leather, and agro-processing. At the same time, the state has some select pockets which have developed competence in niche industrial / service segments, such as Karur for its home textiles and heavy automotives body building, Namakkal for its transportation and poultry, and Virudhunanagar (where Sivakasi town is located) for its fireworks and printing businesses.

The state is divided into 32 districts, of which three are newly formed. Overall, the state performs better in human development indicators compared to rest of the country. However, district level disparity is visible, making it imperative for the state to focus more on the lagging districts. The policy makers have indeed taken cognisance of this need and are striving to devise measures to address this; one instance is the latest intervention by the state to provide health insurance for the low income families. Another example is the socially relevant schemes such as the Vaazhndhu Kattuvom schemes for rural women. While these state level policy measures are laudable, there is a need to better comprehend the diverse needs felt by the economic agents - households and firms – at different regions of the state. Beyond the large cities, the populace in the smaller towns and districts rely on local entrepreneurship for economic wellbeing. Local entrepreneurs, usually small or medium enterprises and often the households themselves, are in turn dependent on the households for their resources and markets. A district level focus and effort to achieve the above is indeed timely in today's context. As noted earlier, different districts of Tamil Nadu are emerging as prominent players in different economic activities. Thus, with different socio-economic and demographic profiles, the districts face diverse governance needs. It is in understanding these governance needs that EEI plays an important role. The emphasis in ranking the districts is not in comparing their status as a destination for large investments; rather it is on the nature of the economic environment for local entrepreneurs and households.

3. Economic Environment Index — Background, Relevance and Importance

There have been a few studies that have analyzed the economic environment in India – these have been from the point of view of the private sector, such as the World Bank Cost of Doing Business⁴ and the World Bank – CII report on Business Climate Study⁵. The former is a continuous effort, and provides a regional perspective in the sense that competitiveness of some of the state capitals are analyzed. These efforts are concentrated on select cities, essentially the state capitals, and thus are limited by the fact that they do not highlight variations, strengths and weaknesses within the state or at district level. They are also focused on particular sectors or stakeholder groups.

States such as Tamil Nadu face a unique challenge – strengthening its tier II cities, even as the state capital Chennai is already on top among the favoured investment destinations in India. EEI developed for the districts of Tamil Nadu can help in addressing the above challenge in two ways:

- 1. EEI provides a systematic understanding of the existing economic environment of the district, thereby providing avenues to target governance measures to strengthen the districts. Over the medium to long run, such regionally inclusive governance can foster sustained development of the entire state.
- 2. EEI helps the policy makers market other districts as destinations for foreign investments, apart from the state capital; to start with, the top ranking districts can be identified as typical investment destinations. EEI helps in creating a proactive and competitive process aimed at improving the local business and social environment as it provides data and benchmarks to enhance transparency and accountability. Progressively, it is envisaged that such continuous measurement of economic environment would help build equanimity across districts as best practices and learnings are adopted across the districts.

3.1 What is EEI?

We view economic environment, as how a government exercises its power in the management of social and economic resources for the region's development. It is the ability of local governments to provide the social, physical and institutional infrastructure that forms the enabling environment for the overall growth and development of households and industries. The Economic Environment Index (EEI) that we are proposing is essentially a measure of this enabling environment provided by the local bodies for private enterprise and households. It is a comparative measure of the

⁴ Doing Business in India (2009) World Bank Publication

⁵ Investment Climate and Competitiveness: A Study of 1,099 Manufacturing Companies, World Bank and Confederation of Indian Industries, 2002.

government influenced conditions under which the private enterprise and households (which affect business environment) operate. EEI that is constructed here is based on both objective data and survey data of users/stakeholders experience.

Building stakeholder participation in EEI construction

A stakeholder approach was incorporated in EEI study methodology from the initial stages. We consider the research and the donor community as important stakeholders. Our initial learning was from EEI efforts executed successfully by the Asia Foundation in some of the Asian countries. This came with a considerable body of literature. Subsequently, our discussion with one of the key researchers in the Asia Foundation's EEI team, Prof. Edmund Malesky, played a pivotal role in shaping the methodology. These learning were incorporated in our proposal for this project to the BHC which, after a careful perusal, provided their inputs.

At the same time, a presentation was made to the Tamil Nadu State Planning Commission on EEI concept note and methodology. The State Planning Commission brought out a detailed report with queries and suggestions. These were incorporated in the methodology. Thus, the State Government was another key stakeholder in this effort.

Once the proposal was accepted by the BHC, we established a partnership with the Confederation of Indian Industry (CII) at its Tamil Nadu chapter. The CII enabled crucial meetings with the industry and entrepreneurs, both small and large across different regions in the state. EEI methodology and concept was explained in detail during these meetings and the views were incorporated. Finally, and very importantly, our partnership with the Centre for Monitoring Indian Economy helped us to get the voice of the economic constituents – both households and firms across the state.

3.2 EEI – Constituents and sub-indices

There are seven sub-indices that constitute EEI.

These sub-indices were chosen in accordance to our stakeholder approach. The steps involved were:

- **3.2.1 Extensive Literature Review**: Apart from in-depth study of several measures of economic environment and indices such as Provincial Competitiveness Index, One Stop Shop in Cambodia, the Economic Environment Index in Sri Lanka, we consulted several studies on different factors affecting business climate, local business environment and economic environment.
- **3.2.2 Expert Opinion**: To select the sub-indices and indicators, experts and practitioners were consulted. The methodology team got the opinion of a number of professionals working on different aspects of business climate and economic environment, academics and government officials on the selection procedure as well as the methodology.
- **3.2.3 Interview and discussion with different stakeholders:** The Centre for Development Finance has worked in close collaboration with CII (Confederation of Indian Industries, Tamil Nadu) and the State Planning Commission (Tamil Nadu) to create this index. The team had regular meetings with these partners as well as other stakeholders such as business houses operating in Tamil Nadu and non-government organizations working on economic environment and other related topics.

The indicators for each sub-index were selected according to the following criteria:

- Relevance: The indicator should be relevant as per our definition of Economic environment for the purpose of Economic Environment Index at district level.
- Availability of Quality Data Source: The indicator should have good quality and timely updated data from reputable sources.
- Interpretability and Comparability: The measure should be interpretable and comparable across all districts.
- Reliability: The indicator should be able to be reproduced by different people using the same coding rules and survey materials.

The UNDP guidelines for selection of policy indicators (Governance Indicators: A Users' Guide) were followed for selection of indicators. There were a number of indicators that were strong contenders for selection, but they could not be included in the final list of indicators for data collection. Lack of quality data and absence of frequently updated data sources were two major constraints.

A significant deviation from other similar indices is the inclusion of households in our proposed Economic Environment Index. Apart from making the Economic Environment Index more inclusive, it makes the index more relevant for policymakers who want to show attention to all constituents. Also for a developing country like India where the line between household and small business, and household and labour market is thin, inclusion of households enables this index to be a better reflection of economic environment. This is the one aspect of the index which we intend to study very closely in the pilot. One of the criticisms of including social infrastructure indicators that largely have an impact on the households is that these indicators, especially the ones focused on outcomes, take time to change and are long-term policy matters. However, there have been studies which have shown measurable changes in such social parameters on a yearly basis⁶. Moreover, the infrastructure inputs that are the basis for several indicators we use can be scaled up quickly with concerted public action.

The selection of variables for the sub-indices has been primarily done on the basis of their relevance and analytical soundness. Since this index captures access as well as quality dimensions of the different aspects of economic environment, variables that reflect the quality of the public good/services provided by the government have been incorporated. For instance, instead of merely using the number of schools and hospitals in a district as indicators of delivery of public

services we have used a wide range of indicators that reflects not just the accessibility of these services but also the quality of these services and satisfaction level of users/consumers. Secondly, those indicators have been excluded which do not significantly vary among different districts, such as centrally enforced policies with limited discretion in implementation. Thirdly, data unavailability has also been one important concern while including/excluding a particular indicator. Although, the primary survey has been our source for many of these indicators, it is not possible to collect data for the full range of indicators we would prefer to include. Proxy variables/indicators have been used to capture some of the aspects of governance where there is no clear indicator for that dimension. For instance, a concept such as accountability cannot be measured by a single indicator and hence we have used proxies such as ease of access to different government documents.

3.3 EEI – Sub-indices

3.3.1 Physical infrastructure: Good infrastructure facilitates access to factor and product markets, thereby raising productivity and profitability. Accordingly, both domestic and foreign businesses are attracted to areas with adequate roads, ports and telecommunication facilities as indicated in several studies (Ghosh & De (1998), Fan & Zhang(2004) and Demurger (2001)). Also, quality infrastructure services significantly affect a firm's profitability via reduction in production costs and ability to reach wider markets. Infrastructure is also an outcome measure of governance and reflects effectiveness and implementation of policies. For our purpose, physical infrastructure is primarily measured by provision of roads, electricity and telecommunication. One popular measure for access to roads is per-capita length of roads. But, this indicator puts areas with high population density at disadvantage and do not truly reflect the real scenario. An alternative measure is the average distance of nearest road from the village. However, this variable is also biased against sparsely populated hilly/barren areas. Combining both the indicators we get a better measure of access to roads.

⁶ For instance, the Annual Status of Education Report (ASER) brought out by Pratham, an NGO focused on education has shown changes in education outcomes in successive years, in states such as Bihar and Uttar Pradesh.

The quality of the road can be measured by the average time taken in traveling a given distance. Similarly, in case of electricity and telecommunication we have taken several indicators that measure its reach/access and more importantly, the quality of these services. The variables for physical infrastructure are given below:

- Percentage of Villages Connected to Telephone Network
- Time taken to get Telephone Repaired
- Percentage of Villages Connected through Power Network
- Supply Quality of Electricity Power
- Electricity Supply for Industries (hrs per day)
- Duration of Tap-water Supply
- Quality of Water Supply
- Time taken to Travel 25 kms
- Density of Roads
- Per capita Length of Roads
- **Social Infrastructure :** Social infrastructure is 3.3.2 about providing basic support, particularly healthcare and educational facilities and is essential for creating quality manpower. The social infrastructure subindex captures health and educational infrastructure and services in a district. To construct this sub-index, outcome variables such as literacy rates, learning outcomes of school children, and infant mortality rate as well as access to these facilities have been considered. However, some input variables have also been included. This is because looking only at outcome variables ignores the fact that similar effort and expenditure might get different results in different scenarios. By including only outcome variables, there is a risk of overor underestimating the efforts of local government. The variables for social infrastructure are given below:
- Pupil-Teacher Ratio
- Percentage of Children Out of School
- Percentage of Children (STD 3 to 5) who can Read

- Percentage of Children (STD 3 to 5) who can do Subtraction
- Literacy Rate
- Infant Mortality Rate
- Percentage of Population within 5 km of a PHC
- Population per bed
- How often Public Health Centers are Closed
- How often Staff is Available in Public Health Centers
- Population per Doctor
- **3.3.3 Governance :** Good Governance and a Regulatory environment are two of the major factors influencing investment decisions and investment climate. Good governance institutions are viewed as reducing uncertainty, as well as the cost of doing business. Good regulatory environment is also important to reduce compliance costs. A conducive regulatory environment implies that local governments have a positive attitude towards businesses.

Governance is perhaps the most complex dimension of the Economic Environment Index. It is possible to argue that governance includes all the other dimensions of our Economic Environment Index. Here it has been used in relatively narrower sense. Under the group of governance we are trying to capture the efficiency with which local government bodies provide public goods and services, as well as their accountability and their transparency. Apart from the crucial social serviceseducation and health it is also important to assess how efficiently they provide identity documents (birth certificate, driving license, ration card, etc.) that act as basic prerequisites for availing government run schemes. Indicators that capture the transparency and accountability of local institutions have also been included. Since there is no clear indicator to capture concepts like transparency and accountability, proxy indicators have been used. Though they do not capture these concepts completely, they do shed some light on these relatively unmeasured aspects of governance.

• Extra Payments made in Obtaining Identity

- Documents
- Process Rating of Obtaining Identity Documents
- Process Rating of Obtaining Electricity Connection
- General Awareness Level
- Percentage of People Aware of Public Grievance System
- Rating of Transparency
- Rating of Public Grievance System
- Days taken to get Electricity Connection
- Days taken to get Telephone Connection
- **3.3.4 Law and Order:** Strong and effective law and order guarantee the security of foreign and domestic investments. They also create many positive externalities for productivity and growth. Availability of legal institutions to settle disputes is an important business consideration and ensures proper enforcement of different contracts and obligations, while ensuring safety and enabling environment for households and individuals. The law and order sub-index captures the availability and efficiency of law enforcing institutions and personnel and the users' experience/perception about law and order.
- Cases pending for Police Investigation
- Percentage of Cases Pending in Courts
- Accessibility of Law and Enforcement Agencies for Concerns
- Problems in Legal System Conflict Resolution
- Law and Order Conducive for Business
- Area per Police Station
- Per capita Police Availability
- Percentage Change in Property Crime (2006 to 2007)
- **3.3.5 Environmental Sustainability:** Unregulated growth of industry can lead to degradation of the local environment and this poses serious risks short-term and long-term for the local populace. It is important to measure the environmental sustainability of the region

to make a meaningful analysis and to ensure that the governance programmes are sustainable over the long run and are least risky to the population. Parameters such as forest-cover, water-table, waste disposal and sanitation form important part of this sub-index. Most of these variables being stock variables, the sub-index captures changes in these variables over a time period. Here we are heavily relying on established data centers rather than survey generated data.

- Change in forest cover
- Depth of water table
- Grazing area to total land area
- Population Density Per sq. km
- Population Growth
- Business Establishment Cost: Business 3.3.6 establishment and regulatory compliance cost aims to capture the kinds of costs that one has to incur while starting a new business. It includes time taken to register a new business, number of licenses required, time taken to acquire land etc. Though there is not much difference in the de-jure regulatory compliance cost across districts, the indirect costs involved such as manpower hours/resources needed to get a particular license or fulfill regulation, loss due to delay and cost of acquisition of land vary significantly from district to district. The indicators selected here have been primarily based on VNCI Provincial Competitiveness Index and Cost of Doing Business Index developed by World Bank.
- Months Waited to Start a Business
- Number of Approvals Required
- Ease of Procedures, Information and Acquisition of Operating Licenses, Permits and Stamps
- Process Rating of Land Title Acquisition
- Cost of Electricity Connection
- Cost of Telephone Connection
- Problems in Access and Cost of Finance in Operation and Growth of Business
- Problems in Obtaining Business License and

Operating Permits in Operation and Growth of **Business**

- 3.3.7 Cost of Doing Business: The cost of doing business – after establishment – is one of the significant factors for any investment decision and like Business Establishment and Regulatory Compliance Costs, it differs from one district to another mainly due to different informal charges and the losses incurred due to poor quality infrastructure and manpower issues.
- Importance of Electricity Back-up for Core **Business**

- Importance of Personal Connections Government Officials
- Awareness Regarding 'Additional Informal Payment' to be Paid to District Authorities
- Being Asked for 'Informal Payment' by Public Officials 'for Getting Things Done'
- Percentage of Firms Requiring Electricity Backup
- Instances of 'Gifting' for Smooth Running of **Business**

4. Construction of Index

The sampling procedure

The primary survey done to capture user experiences for Economic Environment Index is a crucial part of EEI methodology as it provides the data source for several variables. The survey was conducted for both households and business firms in all districts of Tamil Nadu. The sample size (with 95% confidence level and 10 % confidence interval) of 100 households per district and 50 business firms was used for the study. Here, the business firms included a diverse range of business organizations ranging from firms listed at stock exchange to unregistered vendors. For the survey of businesses, a stratified random sampling technique was used.

Sample size for household survey: 3200

Sample size for business firms: 1600

The sampling design and the survey were executed by the Centre for Monitoring Indian Economy.

4.1 Transformation of variables for imputation

Prior to analyzing the missing values, a test for the skewness⁷ of each variable was conducted in order to check for normality of observations. For variables which confirmed a skewness of greater than 2, logarithmic transformations (and square root transformations wherever necessary) were applied to them. These variables were then transformed back after the imputation process.

4.2 Imputing Missing Values

Missing values in any data-set have to be carefully dealt with in order to avoid biased estimates and invalid conclusions. In the data-set collated for EEI, a few missing points were observed which could not be ignored as this would have adversely affected the soundness of EEI ranks. In order to deal with such missing values, the EM algorithm has been used. The EM method consists of two components: first, the expectation (E), which calculates the conditional expectation of the complete data log likelihood given the observed data and the parameter estimates; second, maximization (M) steps, which finds the parameter estimates to maximize the complete-data log likelihood from the E-step, given a complete data log likelihood. The EM algorithm was used for imputation assuming data-set to be missing completely at random (MCAR). For confirmation of data-set to be MCAR, Little's MCAR test was computed using SPSS.

⁷ Skewness is used to measure of the asymmetry of a probability distribution. A normal distribution has no skewness as it is symmetric with mean equal to both median and mode.

4.3 Outlier Analysis

After the missing value analysis, the variables were transformed back to their original form. The next step before Principal Component Analysis, was analyzing the data-set for extreme values. For example, a particular variable might have a value which is particularly high or low in comparison to the rest of the observations. Such values might lead to biased estimates and will overly dominate the aggregation algorithm. In order to reduce such extremities, the Winsorization⁸ technique was used. For every variable, the values exceeding the 97.5th percentile were lowered to the 97.5th percentile and the values smaller than the 2.5th percentile were raised to the 2.5th percentile. Hence, the extreme observations within a variable were trimmed to bring them within the width of 2.5 - 97.5 percentile bounds.

4.4 Normalization of Values

Any composite indicator is made of large number of variables and each variable has different measurement units. Aggregating all variables with different measurement units would render the final index meaningless. Thus, one must normalize the data prior to its aggregation. The following procedure was adopted for normalizing the raw data:

Here, the best would be the maximum value in the observed set of values in each variable, while the worst would be the minimum one. Maximum and minimum would again depend on the nature of the variable. If the variable has a positive influence on the index, the maximum value would be the highest number amongst the observed set of values and in case of a negative influence, the best observation would then become the least valued number in the observed set of values within the variable. It should be noted here that the above exercise will result in all normalized values lying between 0 and 1.

4.5 Weighting and Aggregation

Principal Component Analysis

There are various techniques which can be used to assign weights to the variables for the creation of an index. Table 1 compares the different tools used for aggregation and weighting. While some of these tools such as Principal Component Analysis, Factor Analysis and Data Envelopment Analysis are based on statistical models, there are some such as Analytic Hierarchy Processes and Conjoint Analysis, derived from participatory models.

Table 1: Different Weighting and Aggregation Methods

Weighting Methods	Aggregation Methods		
	Linear	Geometric	Multi Criteria
Equal Weight	Yes	Yes	Yes
Principal Component Analysis / Factor Analysis	Yes	Yes	Yes
Unobserved Components Model	Yes	No	No
Budget Allocation Process	Yes	Yes	Yes
Conjoint Analysis	Yes	Yes	No
Analytic Hierarchy Process	Yes	Yes	No

Source: Handbook of Constructing Composite Indicators : Methodology and User Guide

The selection of appropriate techniques for assigning weights to different sub-indices and indicators was done on the basis of expert consultation, study of various underlying concepts of different techniques and their suitability to the proposed Economic Environment Index. After initial review of different methodology and tools, the options were reduced to Principal Component Analysis and Equal Weight.

Equal weight, a very common approach for assigning weight to composite indicators, was not used for this index as

 using equal weight suggests all indicators have same 'importance' in the index,

⁸ It is a technique to correct for the outliers in the data-set. It does it by moving the extreme value towards the centre of distribution. Here, instead of deleting/discarding extreme value, it is rather replaced certain percentile

 when variables are highly correlated, equal weight approach introduces the risk of double counting when there are collinear indicators in the index.

Principal Component Analysis (PCA) was selected as multivariate methodology for construction of district level Economic Environment Index for Tamil Nadu. PCA has been widely used for construction of different socio-economic status indices. The World Bank used PCA to construct asset indices (using data from Demographic Health Survey Data) for its study of 'Socio Economic differences in Health, Nutrition and Population'. In India, the district level Education Development Index that ranks different districts on the basis of several indicators of education, has been based on PCA. Several studies such as, Gwatkin et al (2000), Filmer and Pritchett (2001) and McKinzie (2003), all using socio-economic indicators have used PCA for different socio-economic indices/studies. For socioeconomic indices, Giri (2004) suggests that 'a natural approach is to use methods such as PCA to try and organize data to reduce its dimensionality with a little loss of information as possible in the total variation these variables explain'.

Vyas and Kumaranayke (2006) highlight that PCA works best when asset variables (in our case socioeconomic variables) are correlated, but also when the distribution of variables varies across cases (in our case across districts). McKinzie (2003) suggests 'assignment of weight on the basis of distribution of assets, that are more unequally distributed – are given more weight'.

For our purpose, PCA works best as the district level EEI does not intend to assign weight on the basis of policy importance of certain variables but on the basis of their unequal distribution, as one of the primary objectives of EEI is to highlight the variation of resources and capacities within different districts of Tamil Nadu. Moreover, PCA highlights the variation between districts due to higher weighting of variables that vary more - this is useful for highlighting priority areas for policies seeking to create a level playing field. We are providing tools on the website to construct

rankings on the basis of user-provided weights to different variables.

4.6 What is Principal Component Analysis?

PCA is a multivariate statistical technique used to reduce the number of variables in a data set into a smaller number of 'dimensions'. In mathematical terms, from an initial set of n correlated variables, PCA creates uncorrelated indices or components, where each component is a linear weighted combination of the initial variables. In simpler words, through PCA, a set of observed variables are reduced to smaller set of variables called Principal Components, which can be used for subsequent analysis. To understand Principal Components in more detail, let us consider a set of variables x_1, x_2, \ldots, x_n . If PCA produces different principal components P1 and P2 for this set of variables, the following equations give detail of these principal components.

$$P1 = a_{11}X_1 + a_{12}X_2 + \dots + a_{1n}X_n$$

$$P2 = a_{21}X_1 + a_2X_2 + \dots + a_{2n}X_n$$

Where a_{1n} = the regression coefficient (weight) for the observed variable n

And X_n= the subject is score on observed variable n

The Principal Components Analysis gives us the Principal Components and Eigen Vectors of the covariance matrix (correlation matrix in case of nonstandardized data) of the variables. The eigen value of a corresponding eigen vector gives the variance for each Principal Component. PCA generates a number of uncorrelated principal components and all these principal components are ordered on the basis of proportion of the variation (in the given data set) explained by the principal component. The subsequent principal components explain additional but less proportion of the variation in the data set. The number of principal components generated is dependent on the degree of correlation among the variables. The higher the degree of correlation, fewer the components are required.

^{9.} http://heapol.oxfordjournals.org/cgi/content/full/21/6/459#SEC3

For construction of EEI, PCA is run twice, first to generate weights to variables within the sub indices and then to assign weights to the sub indices itself. The final score of a district is aggregated on the basis of the weights generated by the PCA¹⁰.

4.7 Final Scores and Interpretation

EEI is a relative measure. A district's score is relative to the best performing district in the analysis. Therefore, it cannot be concluded that the highest ranking district is a perfect district as, though it may be the best performing, there may be significant governance gaps. The final scores, on the basis of which the ranks are assigned to each of the 28 districts of Tamil Nadu discussed in EEI, are made to lie between 0 and 1. The interpretation of these scores is quite simple. Closer the score of a particular district to 1, the better is the overall economic environment in that district and, closer it is to 0, the worse it is in terms of overall economic environment. However, it must be kept in mind that, while such scores are crucial in determining policy measures, they are highly relative and one should be careful while jumping to conclusions regarding the performance of a district on the basis of such scores. For instance, a score of 1 does not directly convert to absolute best performance for that district. There might still be governance gaps in such a district which should not be overlooked.

For example, Nilgiri district ranks number one in terms of the overall economic environment. However, this final ranking is based on aggregated score. There could be considerable variation in performance across different aspects of economic environment. Nilgiri has a relatively lower rank in the sub-index

'Governance', as shown by some of its indicators such as level of awareness about different welfare schemes, the process of obtaining identity documents and level of transparency.

4.8 Districts Selected for the Study

We have conducted the study in all the districts of Tamil Nadu except Chennai, the state capital; however, the results are for 28 districts. Three districts, namely Ariyalur, Krishnagiri and Tiruppur are included with their respective parent districts, namely, Perambalur, Dharmapuri and Coimbatore. The main reason was lack of secondary data on some of the parameters for these new districts with only composite district data being available.

Chennai not included in the study: Chennai, the capital city and one of the districts of the state has been excluded for the following reasons:

- Chennai, being one of the largest metro cities 1. in India, would be a significant outlier in many indicators, thereby increasing the variance in a large way. This would pose methodological problems that may significantly affect the objective of the study
- It has been a stated objective of the State 2. Government and CII to promote and support economic activities in the tier-II cities of the state. So it is relevant to concentrate on the other districts.
- 3. Chennai is a 100% urbanised geography with unique governance needs, which CDF would strive to address over time.

The detailed working methodology along with SPSS output can be accessed from our website http://www.economicgovernance.com

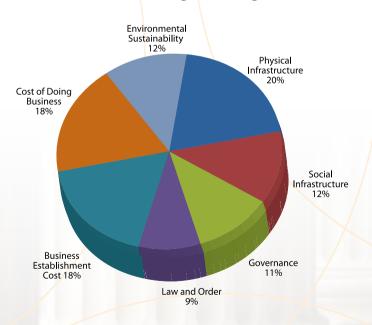
5. EEI — Results and Rankings

The final EEI score is the aggregated score of seven sub-indices using the weights assigned by PCA. In order to understand the driving factors behind the final score it is important to keep in mind the weights assigned to different components of Economic Environment Index. As evident from pie chart, the sub indices - Physical Infrastructure, Business Establishment Cost and Cost of Doing Business - assume relatively higher weights than the rest of the sub indices. PCA has been used to determine these weights, both for variables within each sub index and for the sub indices themselves. As explained in the earlier section, the PCA is a widely used technique to assign weights based on the characteristics of the data itself.

It assigns higher weights to those sub indices which exhibit greater variability across the districts. Thus, a higher weight to Physical Infrastructure, Business Establishment Cost and Cost of Doing Business is due to the fact that the variation for these sub-indices is relatively higher than the variation in other sub indices...

A look at the weights

Distribution of Weights Among Sub-indices

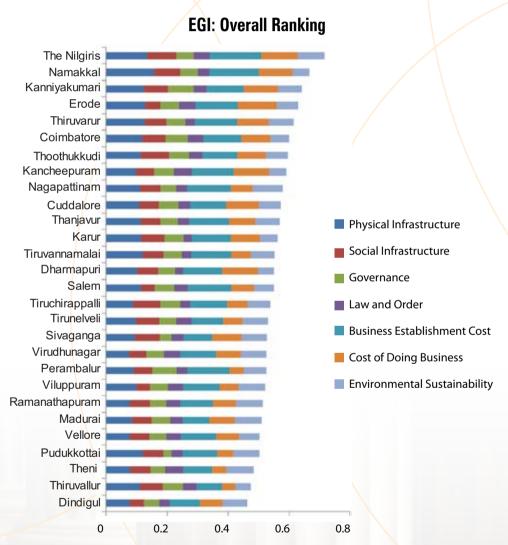


Physical Infrastructure, Business Establishment Cost and Cost of Doing business together account for more than 50 per cent of total weight making the other four sub indices Social Infrastructure, Governance, Law and Order and Environmental Sustainability relatively less

important in determining the final EEI Score. Clearly, any marginal improvement in the first three sub-indices would lead to higher increase in the final EEI score than similar improvement in any of the last four sub-indices

5.1 Analysis of Overall Ranking

The following graph illustrates the relative rankings of different districts on overall EEI score. The top ranked districts have done very well on 'Physical Infrastructure' and on 'Cost of Doing Business' sub-indices. All the top 7 districts except the top ranked 'Nilgiris' have scored on an average lower than the other districts. Four of the top seven districts on overall EEI score are placed in the bottom seven on the 'Environment Sustainability' sub-index. Physical Infrastructure, with overall 20% weight in the composite index seems to be the dominating factor behind overall high or low rank of a district. Five of the seven districts placed in the last quartile on overall EEI rank are placed in last quartile on Physical Infrastructure as well.



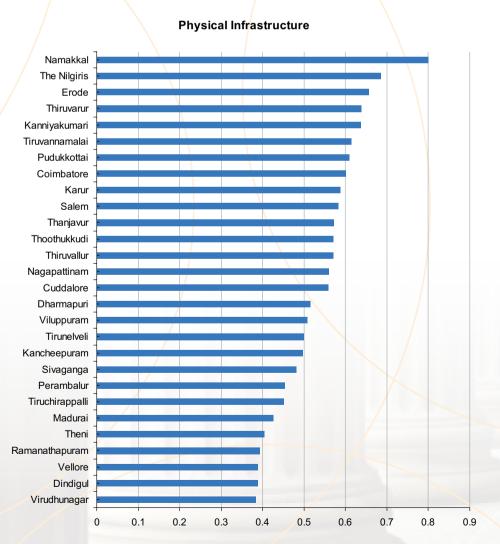
Districts have been able to compensate for their low performance on one or two sub-indices by consistently doing good on other sub-indices or very high score on one or two sub-indices. There are very few districts who have got very low or very high score on all the sub-indices. Even the districts placed in the last quartile have outperformed many top quartile districts on some sub-indices. For example, Pudukkotai placed in last quartile in overall ranking has been placed in top quartile on 'Physical Infrastructure' and 'Environment Sustainability' sub-indices.

5.2 Sub index wise Analysis

Aggregated scores often hide more than they reveal. It is therefore important to analyze the disaggregated data to gauge district's performance in each of the seven sub-indices of EEI. There exists significant variation in a district's performance across different sub-indices that will be highlighted in this section.

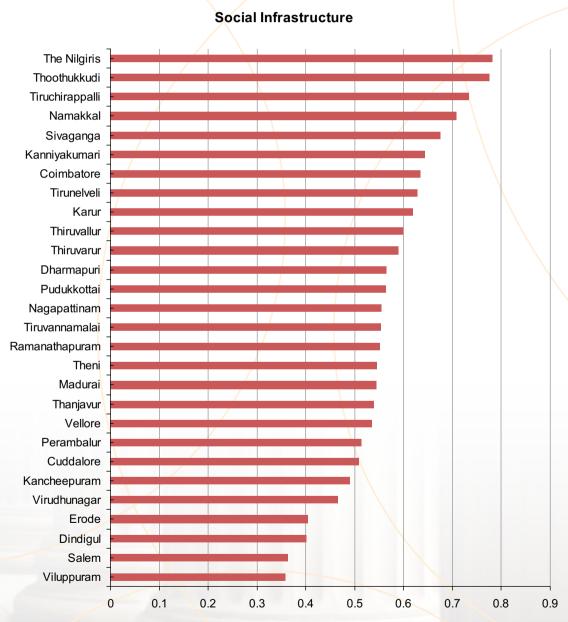
5.2.1 Physical Infrastructure

The sub index Physical Infrastructure assumes the highest weight (20 per cent) in the construction of the index due to the greater variability of the values within the sub index. The graph below ranks districts on parameters that include variables like time taken to get a telephone repaired, percentage of villages connected through power network, and time taken in travelling 25 kilometers. Thus the sub index captures both the quality of and access to physical infrastructure. Here we see that all the districts have scores ranging roughly between 0.4 and 0.8. It is evident that Namakkal outperforms all other districts and stands at rank one with a score of 0.8 while Virudhunagar lags behind right at the bottom at number 28 with a score of 0.38. It is also observed that the top ten ranked districts in terms of overall economic environment also have high ranks for physical infrastructure. A sound physical infrastructure will have direct benefits on other parameters of governance as well. Physical infrastructure is also widely accepted as a pre-cursor to development outcomes.



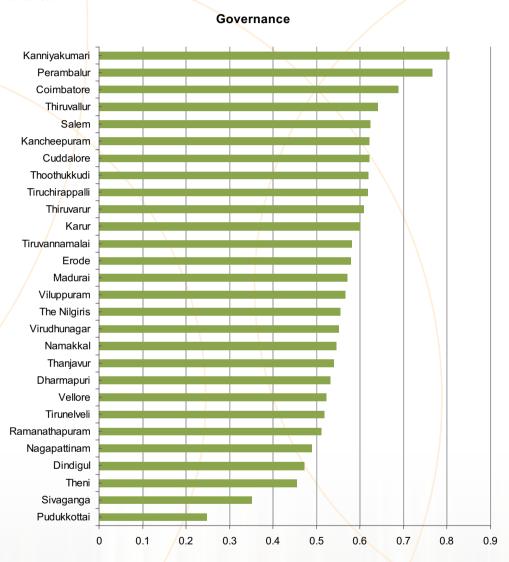
5.2.2 Social Infrastructure

Social Infrastructure is one variable that cannot be overlooked by any state. A good education system, high literacy rates and efficient public health centres will highly reflect the social welfare of the people living within the district. This sub index captures such welfare level within each district by including various other social welfare measures. The graph reveals an interesting finding of EEI and ranks Nilgiris at number one with a score of 0.78 and Viluppuram the last with a score of 0.35. An interesting observation here is for Kancheepuram which features as rank number 8 in terms of overall economic environment but is at rank number 23 for Social Infrastructure. This is a major area of concern as it might affect parameters of economic environment in the long term for Kancheepuram. This is also the reason as to why we emphasize at every stage that the overall economic governance index might be quite misleading at times and a closer look at disaggregated scores would come into use here.



5.2.3 Governance

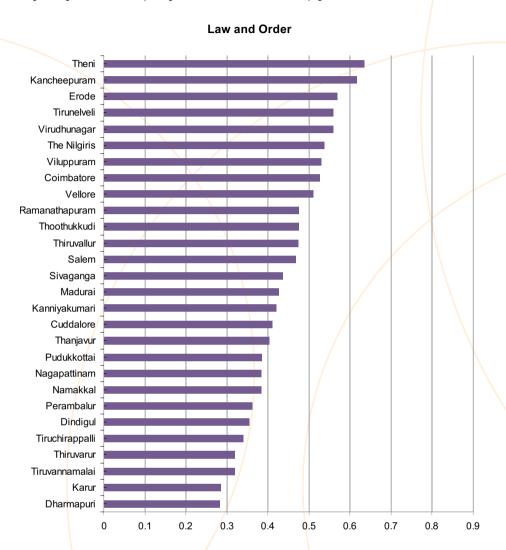
A transparent and an efficient public system is the key to relieving many of the bottlenecks experienced by a district. An interesting observation here is the extreme variability in the best and worst performing district in terms of this sub index. While Kanniyakumari has the highest score of 0.8, Pudukkotai has an extremely low score of 0.25. While we have only Perambalur and Coimbatore somewhat nearing the highest score, most are still lagging far behind this score. This is an important indication to policy makers regarding the highly unequal performance across districts in terms of Governance.



5.2.4 Law and Order

There is significant variation across districts in their scores on this parameter. There is a wide range of indicators that attempt to capture different aspects of state of law and order such as access, quality, perceptions of businesses and households, efficiency of law and enforcement agency. The better performing districts such as Theni, Kancheepuram and Erode have on an average done very well in most of the indicators of law and Order. However, the average and lower performing districts show huge variation across different indicators. For instance, Cuddalore district ranks 17th

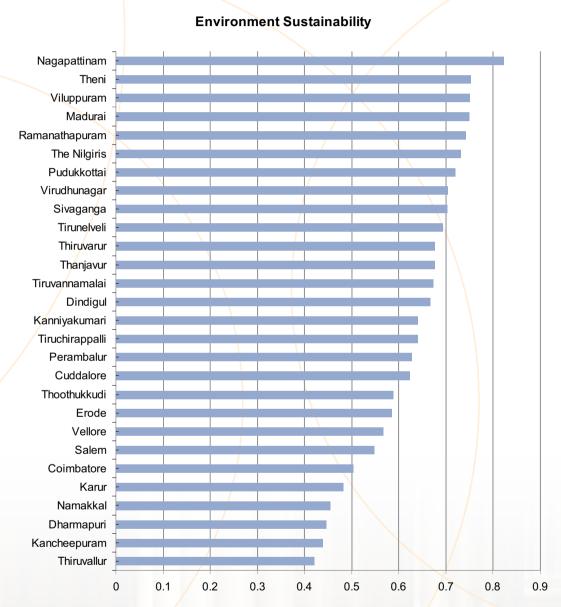
in the overall ranking of this sub-index but is the best district when it comes to reducing the total number of property crimes in past one year. Similarly, Tiruvarur District has low overall rank of 25 but performs well in terms of access indicators such as per capita availability of police and area covered by police stations.



5.2.5 Environmental Sustainability

While the final weights assigned to environmental sustainability (12 percent) is relatively low compared to physical infrastructure (20 per cent) and Costs of Doing and Establishing Business (18 percent each), but this sub index is becoming an increasingly important national and international issue. An environmentally unsustainable growth path may have very marginal impact on the overall EEI score but it would definitely drastically reduce the quality of life of the inhabitants and constrain the economic growth in long run. Again, in the case of this sub-index the top performers have shown above average performance across most of the indicators. Nagapattinam tops the table with overall score of (0.82) followed by Theni, Viluppuram, Madurai and Ramanathpuram to form the top five. Some of the districts such as Cuddalore and Tiruvannmalai have performed very well in terms of mean depth of water table, population growth and proportion of grazing to total land, but their poor scores in population density and inability to protect the forest cover has dragged their overall scores close to the average level. Although the districts in bottom five in general show poor performance, they always have one or two indicators with extremely good scores. For instance, Tiruvallur

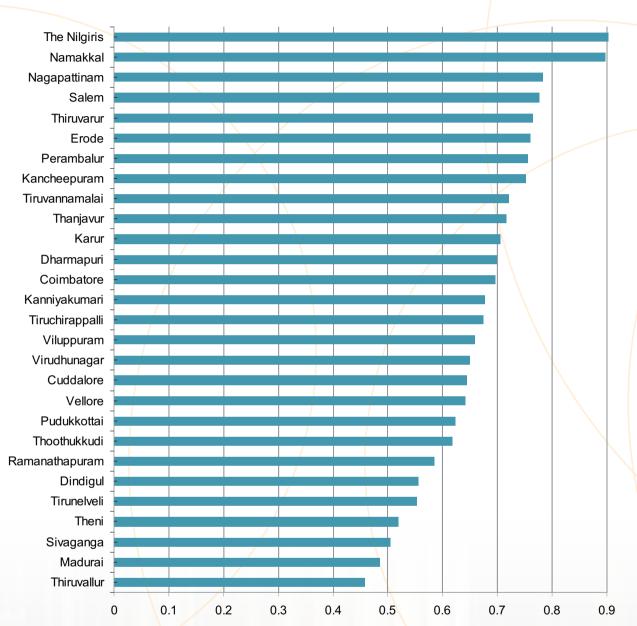
has been ranked the last district in terms of overall sustainability but it has done exceptionally well in maintaining the ground water table. It is interesting to note that some of the best performing districts in overall level of economic environment have low environmental sustainability scores. For instance, Namakkal, Erode and Coimbatore district with exceptional overall EEI ranking of 2, 4, and 6 have very poor environmental sustainability ranking of 25th, 20th and 23rd respectively. This poses a significant policy challenge to the state: that is to balance economic performance and maintain environmental sustainability. It is here that a decentralised approach in planning could help, as local populace would demand better environmental standards.



5.2.6 Business Establishment Cost

Business Establishment cost is one of the most important components of the Economic Environment Index as it assumes 18% of total weight. Higher scores in the business establishment cost means it is less costly to establish business in that district. Nilgiris tops the rankings with the overall score of 0.93 followed by Namakkal (0.89), Nagapattinam (0.78), Salem (0.77) and Tiruvarur (0.76) to form the top five. Nilgiris, Namakkal and Nagapattinam have registered good performance in all the constituent indicators of Business Establishment Cost. Salem district with overall rank of 4 performs well in all the indicators except the land acquisition process where its score is worst among the entire districts. Madurai district has relatively lower number of approval requirement and time to start new business but its low score in rest of the indicators pushes down the overall ranking to 27th.

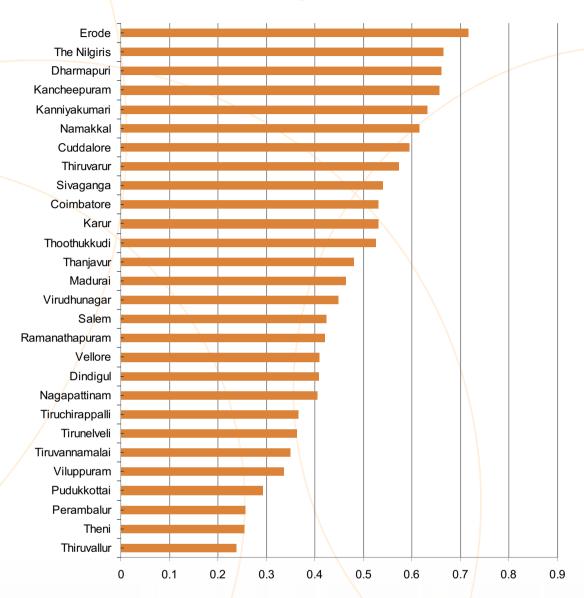
Business Establishment Cost



5.2.7 Cost of Doing Business*

The sub index Cost of Doing Business ties with Business Establishment Cost for it to have the second highest weight (18 per cent) derived by PCA, which indicates the greater variability in the values across the districts. The higher variance across districts, or non uniformity in the performance, of this sub index is an important point for policy makers to take note of. Erode is at number one with a score of 0.71 and an overall economic environment rank of 4. Within the sub index, Erode supersedes all other districts in maintaining a transparent flow of transactions for conducting business. Tiruvallur ranks 28 in the sub index and has fared badly in most of the parameters within the sub index.





*Higher the score, lesser the cost of doing business

5.3 District Profiles in Detail

This section deals with individual district profiles. We highlight the performances of each district in each of the sub indices, which throws further light in understanding how the district's overall ranking is built - which are the sectors which contribute to its high and low ranking, within each sub-index.

For example, an overall rank of 'two' for Namakkal district does not imply that it ranks ahead of the rest of the districts for all the individual sub indices. The current dataset shows that this same district ranks '25' when it comes to Environmental Sustainability. Similarly, an overall economic environment rank of '28' for Dindigul does not mean that its performance is the worst in each of the parameters of economic environment. From the current dataset it is evident that Dindigul has been ranked '14' for its Environmental Sustainability. This way, no particular district is ranked

lowest or highest in all the sub-indices of EEI. In each district, there are certain driving factors which can be set as an example for other districts which are perceived to be relatively poorer in the same domain, and there are certain constraints that prevent the district from doing well which need to be brought into picture. Also, it is important to stress on that economic environment aspect in each district which needs the most immediate attention. For example, within a district the seven sub indices need to be compared with each other so as to know which aspect needs to be brought into light for future policy measures. Hence, this section highlights, through a simple graphical display, various economic aspects of each district which can be used as a tool by policy makers to direct the resources to wherever there are governance gaps.

The section takes the help of graphical explanations to highlight the same. The radar charts compare the aggregate values of multiple data series and display changes in values relative to a centre point. The interpretation of the chart is quite simple. The further the values are away from the central point, better is the performance of that sub index. For Kancheepuram, the sub indices Business Establishment Cost and Cost of Doing Business do relatively better than other sub indices like Social Infrastructure and Environmental Sustainability. Then we also have seven other radar charts for each district which highlight the performance of variables within each sub index of governance. For example, within 'Physical Infrastructure', there are various variables which were used to construct this sub index. It might be so that the performance of these variables might vary from each other and thus the same is being highlighted here.

6. Recommendations

Decentralisation: EEI has to be viewed in the context of understanding the overall economic environment in a district within which the economic agents, namely the firms and households, operate to leverage their resources to foster their economic wellbeing in a sustainable manner. It is important to recognise the district level variance within the state as revealed by the data and ranks, which reflect the different needs of the districts. This calls for a meaningful and targeted decentralisation in the administrative and planning process. Indeed, the Planning Commission of India has taken cognisance of the need for decentralised planning process at the district level and further at the panchayat level in the Eleventh Five Year Plan, and has released a "District Planning Manual" to help this process, which has been elaborated earlier in the report. Specifically, it calls for efforts to identify "...infrastructure status and gaps, the aims and vision of the local people and weighing options of lead sectors..." to foster inclusive growth. EEI could be used as one indicator of these gaps. A decentralised planning and executive process promotes better and faster development. However, it is imperative that best practises are shared among districts, for decentralisation to work effectively.

Leverage on established strengths: Research in countries where measuring economic environment has been practised for over a decade has shown that implementing an actionable programme based on EEI findings, improves overall economic progress of the regions. More importantly, research has also shown that there is a spread of improved economic environment performance in districts around geographies that show higher ranking in EEI – implying that districts surrounding better performing districts catch up on economic environment over a period of time.¹¹

Plan and execute targeted governance programmes: EEI provides valuable information on how districts rank in different areas of economic environment. It is a useful and indicative guide for local officials, the private sector, and other stakeholders to compare the performance of their area to that of other localities and identify the strengths and weaknesses of their economic environment. Therefore, it would be ideal if the stakeholders – primarily the Government of Tamil Nadu and the other stakeholders, including industry associations utilise the rankings – both the overall and the sub-indices to actively target specific governance measures at specific geographies.

Concentrate on parameters that show higher weight in order to ensure greater equality across districts: EEI is a construct with a number of sub-indices, within each of the broad groups. Some of the parameters show higher variance and these result in higher weights observed

¹¹ Economic Environment Index – Endowments, Location or Luck? Evaluating the Determinants of Sub-National Growth in De-centralised Indonesia, Dr. Neil McCulloch, The Asia Foundation, 2008.

for these parameters in the overall construct. Concentrating on such high variance parameters can help bring uniformity or a geographical level-playing field for the economic agents - namely the firms and the households.

Low score in EEI may be indicative of rapid development or other pressures on government **services**: Pressures on economic environment are not uniform across districts. Obviously, a district which attracts lot of investments or has a higher population density has an excess demand for various regulatory and public utility services provided by the government and this is reflected in EEI ranks. It could be that the government machinery needs to be larger at these locations for better economic environment and development, and also to sustain the growth process. An

active involvement of the respective district authorities in the planning process would help improve the score of such districts.

Strengthen local entrepreneurship: Beyond the large cities, across the districts and in smaller towns, it is the local entrepreneurship that supports and sustains the economic activities and provides employment for the populace. The households' ability to leverage their resources and pursue economic opportunities is bound by the economic environment that they face in the district. EEI could be used as a tool to identify constraints in the economic environment and also the relative strengths that act as the driving factors for the district, thus enabling targeted interventions to promote, sustain and strengthen entrepreneurship, economic growth and overall development.

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APPENDIX —

List of Districts included in the study:

1	Coimbatore (includes Tiruppur)
2	Cuddalore
3	Dharmapuri (includes Krishnagiri)
4	Dindigul
5	Erode
6	Kancheepuram
7	Kanniyakumari
8	Karur
9	Madurai
10	Nagapattinam
11	Namakkal
12	Nilgiris
13	Perambalur (includes Ariyalur)
14	Pudukkotai

15	Ramanathapuram
16	Salem
17	Sivaganga
18	Thanjavur
19	Theni
20	Thoothukudi
21	Tirunelveli
22	Tiruvallur
23	Tiruvannamalai
24	Tiruvarur
25	Tiruchirappalli
26	Vellore
27	Viluppuram
28	Virudhunagar

ECONOMIC ENVIRONMENT INDEX - 2009

APPENDIX — II

List of Variables for EEI

List of \	Variables for EEI				
S.NO	SUB INDEX	VARIABLES IN EACH SUB INDEX	MEANING OF HIGH SCORE		
	Physical Infrastructure	Percentage of Villages Connected to Telephone Network	Positive		
		Time taken to get Telephone Repaired	Negative		
		Percentage of Villages Connected through Power Network	Positive		
		Supply Quality of Electricity Power	Positive		
1		Electricity Supply for Industries (hrs per day)	Positive		
1		Duration of Tap-water Supply	Positive		
		Quality of Water Supply	Positive		
		Time taken to Travel 25 kms	Negative		
		Density of Roads	Positive		
		Per capita Length of Roads	Positive		
	Social Infrastructure	Pupil-Teacher Ratio Percentage of Children Out of School	Negative Negative		
		Percentage of Children (STD 3 to 5) who can Read	Positive		
		Percentage of Children (STD 3 to 5) who can do Subtraction	Positive		
		Literacy Rate	Positive		
2		Infant Mortality Rate	Negative		
2		Percentage of Population within 5 KM of a PHC	Negative		
		Population per bed	Negative		
		How often Public Health Centres are Closed	Negative		
		How often Staff is Available in Public Health Centres	Positive		
		Population per Doctor	Negative		
		Topulation per Doctor	Tregative		
		Extra Payments made in Obtaining Identity Documents	Negative		
	Governance	Process Rating of Obtaining Identity Documents	Positive		
		Process Rating of Obtaining Electricity Connection	Positive		
		General Awareness Level	Positive		
3		Percentage of People Aware of Public Grievance System	Positive		
		Rating of Transparency	Positive		
		Rating of Public Grievance System	Positive		
		Days taken to get Electricity Connection	Negative		
		Days taken to get Telephone Connection	Negative		

S.NO	SUB INDEX	VARIABLES IN EACH SUB INDEX	MEANING OF HIGH SCORE	
	Law and Order	Cases pending for Police Investigation	Negative	
		Percentage of Cases Pending in Courts	Negative	
		Accessibility of Law and Enforcement Agencies for Concerns	Positive	
4		Problems in Legal System Conflict Resolution	Positive	
4		Law and Order Conducive for Business	Positive	
		Area per Police Station	Negative	
		Per capita Police Availability	Negative	
		Percentage Change in Property Crime (2006 to 2007)	Negative	
			D :::	
		Change in Forest Cover	Positive	
_	Environmental	Depth of Water Table	Negative	
5	Sustainability	Grazing Area to Total Land Area	Negative	
		Population Density Per sq. km	Negative Negative	
	Population Growth			
		Months Waited to Start a Business	Negative	
	Business Establishment Cost	Number of Approvals Required	Negative	
		Ease of Procedures, Information and Acquisition of Operating Licenses, Permits and Stamps	Positive	
		Process Rating of Land Title Acquisition	Positive	
6		Cost of Electricity Connection	Negative	
		Cost of Telephone Connection	Negative	
		Problems in Access and Cost of Finance in Operation and Growth of Business	Positive	
		Problems in Obtaining Business License and Operating Permits in Operation and Growth of Business	Positive	
		Importance of Electricity Rock up for Core Pusiness	Magatina	
	Cost of Doing Business	Importance of Electricity Back-up for Core Business	Negative	
		Importance of Personal Connections to Government Officials	Negative	
		Awareness Regarding 'Additional Informal Payment' to be Paid to District Authorities	Negative	
7		Being Asked for 'Informal Payment' by Public Officials 'for Getting Things Done'	Negative	
		Percentage of Firms Requiring Electricity Backup	Negative	
		Instances of 'Gifting' for Smooth Running of Business	Negative	

ABOUT CDF

The Centre for Development Finance is an action research think tank focused on improving governments' and markets' capacity to channel finance into sustainable, holistic development. Our research and consulting in two core areas - Infrastructure and Governance as well as Environmentally Sustainable Finance - seek to influence public policies, improve program implementation and impact, and inform private and nonprofit interventions. Analysts in our Development Metrics group enable more effective prioritization and oversight of development interventions by developing platforms for aggregating and disseminating local socio-economic data. The Strategy Advisory Group concentrates on providing strategic insights and project guidance while designing customized solutions for development entrepreneurs, corporates, investors and non-profits seeking to contribute to India's development. Our approach across all program areas combines deep contextual knowledge and operational experience with academically grounded development insight to contribute to more effective delivery of the infrastructure and services that are essential underpinnings for inclusive, sustainable economic and social opportunity.

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