

## **TWO CULTURES OF ECONOMICS: APPLYING ECONOMETRIC AND STATISTICAL TOOLS TO DEVELOPING COUNTRIES IN THE 21st CENTURY**

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### **ABSTRACT**

There is a large variety of role and dimensions, from governance to education, agriculture to foreign affairs, where there is a need to combine Science Technology Engineering and Mathematics (STEM) fields with relevant parts of the Arts and Humanities. This is particularly rooted in the utilization of statistics, mathematical analytical tools and econometric techniques in each of these areas. Over time, people and indeed even governments have come to realize the importance of fusing the role of the sciences (including statistical and econometric sciences) with the humanities, to create solutions to existing problems that are holistic in more ways than one. Many, including Steve Jobs, have previously proclaimed the importance for this need. A few examples of key areas where econometric and statistical tools are crucial is specifically in the case of developing countries -- where there is a large and overwhelming need to assess populations through censuses, analyze the needs of large numbers of individuals, communities and societies through Big Data analysis. This paper will examine the importance of fusing the role of the sciences with humanities, particularly in the context of developing countries, with a specific focus on the issues faced with data in India. The paper will pose policy recommendations based on CP Snow's 'Two Cultures' Model in the Indian context, as a template for developing countries.

**Keywords:** Cultures, Economics, Government, STEM, Arts and Humanities

### **INTRODUCTION**

Science and technology are key to economic and social development, yet the capacity for scientific innovation remains globally unequally distributed. In addition, the application of scientific knowledge and innovation across disciplines is grossly inadequate and the interdisciplinary advantage provided by the linking of the sciences and the humanities, generally considered to be disparate and even divergent fields, remains untapped. In particular, there is much to be gained through the infusion of statistics and econometrics into the humanities, and

their further application to public governance and policy, especially for the developing nations, which are at the short end of the global inequity in pervasive scientific penetration.

The most notable example of the impact of inclusion of data in public governance is the census. In diverse and vibrant developing democracies like India, the census is a pre-requisite to ensure that each community gets adequate representation in government. For instance, according to the census website of the government of India, "*the delimitation / reservation of constituencies-parliamentary /assembly / panchayats and other local bodies is also done on the basis of the demographic data thrown up by the census*" (Office of the Registrar General and Census Commissioner, India). Moreover, the census also aids the equitable distribution of public funds and resources, like educational programmes, healthcare schemes, law enforcement resources and highways, which are allocated on the basis of population and need (Barazesh, 2009). In India, according to the government, it provides valuable information for planning and formulation of policies for Central and the State Governments and is widely used by National and International Agencies, scholars, industrialists etc (Office of the Registrar General and Census Commissioner, India).

The impact of data, and specifically statistical and econometric analysis, can be seen more prominently in the governance of rural India. To that end, the Ministry of Rural Development has taken various steps at different levels for providing opportunities, information and ease of access of the rural development Schemes to citizens in rural India (Bhatia and Kiran, 2016). This has been done by way of strengthening the ICT infrastructure and facilitating access to several services and information in a cost effective manner. This has been touted as being particularly helpful to farmers, who have been widely acknowledged as being disadvantaged by virtue of their poor access to information (Bhatia and Kiran, 2016).

Having said that, there are key shortcomings in the use and reliance on statistics in Indian governance and policy. For instance, India's public health statistics have been found to be unreliable, including the data from the National Family Health Survey (NFHS-4), the largest public source for detailed health statistics in India which operates under the oversight of the Ministry of Health and Family Welfare (Bansal, 2019). Further, issues of inflated growth figures and the lack of access to primary sources have also played a role in stifling the positive impact that statistical and econometric analysis can play, particularly in rural governance (Bansal, 2019). The gaps in India's statistical reliance has even been pointed out by then Vice-President, Mr. Hamid Ansari, according to a press release from the Press Information Bureau of the Government of India (Press Information Bureau, 2016).

This paper will address the various lacunae in application of STEM learnings in public governance in India, by analysing P.C. Snow's 'Two Cultures' approach and understanding its application to the Indian context.

## **BACKGROUND**

The 'Two Cultures' is the first part of an influential 1959 Rede Lecture by British scientist and novelist C. P. Snow. Its thesis was that "the intellectual life of the whole of western society" was split into two cultures – the sciences and the humanities – which was a major hindrance to solving the world's problems (Snow, 1959). Snow's model was developed as a critique of the British education system, which he believed had placed a higher emphasis on the humanities at the expense of science and engineering education (Snow, 1959). He believed than an education system which placed equal emphasis on the sciences and humanities, enabled citizens to compete more effectively in the scientific age (Snow, 1959). The biggest and most notable critique of the Two Cultures model came from the literary critic F.R. Leavis, who believed that Snow had trivialized the role of culture and the humanities, and that the technological revolution needs those who specialize in questions going beyond the confines of science, engineering, and technical knowledge (Kimball, 1994). There are also critiques which doubt the relevance of the model in the current age (Dizikes, 2009). Further, for the purposes of this paper, it is also pertinent to note that Snow's conception places heavy emphasis on education and therefore, this paper will extrapolate more general principles of the thesis.

This is of particular relevance with respect to data collection in India, as there are several issues in collecting statistics from rural areas. Combining both qualitative and quantitative approaches is likely to help address both the technological and ethical conundrums that arise with respect to rural data collection.

Social statistics is the application of statistical methods to social science data. Social statistics uses the same mathematical tools as any other form of statistical analyses but it uses them in different ways that take into account the distinct features of social science data (United Nations, 1979). Because social statistics were born of administrative processes, statisticians have traditionally tended to identify mainly with administrative concerns and to concentrate on the conditions closest to the administrator even in their description of social circumstances. In developing countries, where there is enormous divergence in social conditions, social concern and description and the search for data beyond the censuses nevertheless tend to be concentrated on that small segment of the urban population with the greatest access to well-established social services (United Nations, 1979).

The recording process for this group is also administratively most manageable but the net result is a serious distortion effect in measurement. Social statistics have been concentrated in the

"modern" sector and are thus not equipped to measure the total social reality. A distinction needs to be made between on the one hand policies for improving social statistics which are idealistic expressions of long-term aspirations in response to social and political imperatives and on the other hand practical guides for early action (United Nations, 1979). Making social statistics more relevant, sufficient, timely and co-ordinated will take considerable time and resources. Responsible authorities should not only be convinced of the usefulness of the undertaking but also be aware of its probable results and the probable time scale (United Nations, 1979).

The following section will further discuss the relevance of the Two Cultures model in the context of India, and possible policy recommendations for how it can be used to further the cause of social change.

## **DISCUSSION**

There is a growing concern with the problem of internal disparities in developing countries and the realization that the equitable distribution of wealth is as important as the growth of total resources. This is leading to policies of national integration, the lessening of regional inequalities, the creation of social funds, the redistribution of national income etc., in order to correct distortions arising from current models of economic development (United Nations, 1979). An improved social statistical service would be able to play an important role in measuring and evaluating the changes brought about by these new policies and in helping to solve the problems encountered in their implementation. In some countries, priorities will be established on the basis of some unitary concept or theory of social change or development, and other countries may establish priorities on the basis of the importance of the gaps identified or on the basis of those sectors or regions that seem to provide the best opportunity for improvement in the short run (United Nations, 1979).

Therefore, especially from the perspective of developing countries, there is a great importance of bringing an understanding of statistics and econometrics to the general public.

The Two Cultures model is relevant in this context, because it is now recognized that there is a need for there to be better modes of data collection and analysis. By integrating perspectives from both the sciences and the humanities, quantitative and qualitative frameworks can both be used to further better the accuracy of social statistics.

Particularly, the usage of Big Data analytics and the internet of things has the potential to transform the manner in which technology and data can be made more accessible to the general public, in line with the two cultures model (Vats and Khan, 2017). Further, using the basis of the model, there must also be large scale educational reform that creates awareness of technological developments. Particularly in a country such as India wherein access to basic information is

disparate between urban and rural areas, it is key for the population to be made aware of technological advancements and the meaning of the data collected.

Although India depends on sample surveys for tracking health parameters, there is a need to improve civil registration and vital statistics systems. The reliance on sample surveys is a result of the inadequate coverage of its civil registration system. the existing sample surveys that collect data at the national level should be assessed for their comprehensiveness in a way that will improve disaggregated tracking of national goals (Kurian, 2017). Unit-level data from sample surveys remains an under-utilised resource but numbers from databases like the National Sample Survey's (NSS) 'state samples', whose collection uses up vast amounts of tax money, are often not used at all. The pooling of central and state samples and the ability to calculate district-level estimates across socio-economic categories will enhance the policy relevance of the data collected and its subsequent analysis (Kurian, 2017).

Setting up a national forum on different types of statistics (such as health, education, sanitation, etc) in line with the federal inter-agency forum on child and family statistics of the United States of America may help facilitate efficient coordination between the numerous agencies and government arms who collect, analyse and disseminate data. If India is aiming to improve the quality, availability and timeliness of data necessary to track national goals for different areas of policy, it has to address the core issue of the fragmentation of efforts. Routine monitoring systems installed to help flagship schemes may not be attuned to provide reliable data by themselves (Kurian, 2017).

Although several government departments and ministries collect data across institutions and other stakeholders, these are not in line with standard definitions. This calls for systematic efforts at the central level, taking state governments and departments on board, in the form of a national forum. Such a national forum can standardise definitions, streamline the collection of data, triangulate existing data and avoid duplication in order to bring out a comprehensive set of indicators every year that will track the progress of various indicators at the sub-district level (Kurian, 2017).

Even though changes in regulations, new survey initiatives and increasing digitization have provided the Indian state with far more information than ever before, there is no evidence that such data is being collected and processed efficiently (Bhattacharya, 2017). One glaring example is the use of the MCA-21 database for GDP estimation. Statisticians seemed to have decided to use the database first, and ask questions later, and have failed to release the detailed data or the summary tables till date. A similar problem seems to plague the Socio-Economic Caste Census (SECC) (Bhattacharya, 2017). This census was potentially a far-more important initiative than Aadhaar, as it was initiated to precisely identify those who could be targeted for welfare

schemes. But as several economists have pointed out, the SECC data suffers from serious flaws. While it is a step forward compared to the past, it is also an opportunity lost. Instead of examining the processes that led to the collection and processing of the SECC data, the government first announced that it is going to use the database, and then set up a committee, headed not by a statistician but an ex-bureaucrat, to examine the data (Bhattacharya, 2017).

The digital age raises newer challenges. The questions of which entity will store data in what form and with protections, how and when such data will be collected, used, shared, or disseminated have become much more important than ever before (Bhattacharya, 2017; Vats and Khan, 2017) Comprehensive analysis and an equal emphasis on data analysis through technology, and meaningful policy making, incorporating the humanities. This is crucial given the challenges mentioned above, which clearly demonstrate the lack of a holistic approach.

## **CONCLUSION**

The Two Cultures framework has potential for other developing countries as well, given that several countries such as China, and within Africa and Latin America face similar problems with respect to poverty, malnutrition, and a lack of awareness and education among the populace. An improvement in the ability of a country to accurately gauge and analyse these issues has far reaching implications with respect to politics, the economy and democracy.

In conclusion, an integration between technology, science and the humanities is crucial in the policy sphere. Given the inaccuracies in data collection and an inaccurate representation of those from marginalized and poorer sections of society, Snow's model does provide valuable insight, especially given the rapid progress of technology, automation and the cultural changes that will come with the same.

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