

Modernisation of Information System for Economic Statistics: An Integrated Approach

R. B. Barman

**M.N. Das Memorial Lecture delivered during 19th Annual conference of Society of
Statistics, Computer and Applications held at SKUAST-J during 06-08 March 2017**

Economics and Economic Statistics

- **Economic statistics is to be understood in the context of economics. Economics is variously defined. The easiest one is "Economics is about how economy works." The intellectual idea on economics, however, is not this simple. Borne out of behavioural traits of people, economics builds on rational choices of individuals and firms for developing theory. The economic agents are expected to maximize their utility in a frictionless market economy following the axiom of rational choice theory. The market is seen as coordinator of economic agents through price mechanism. In the process, a general equilibrium is ensured by the price mechanism and frictionless and competitive rational choices of market participants. The causes of growth, allocative efficiency and equity are expected to be best served through the invisible hands of efficient market. However, the reality is not as smooth and frictionless as the theory assumes.**
- ***Agents behave differently over time and space. We need empirical on competing theories, including complex systems theory, for which we need micro-macro linkage.***

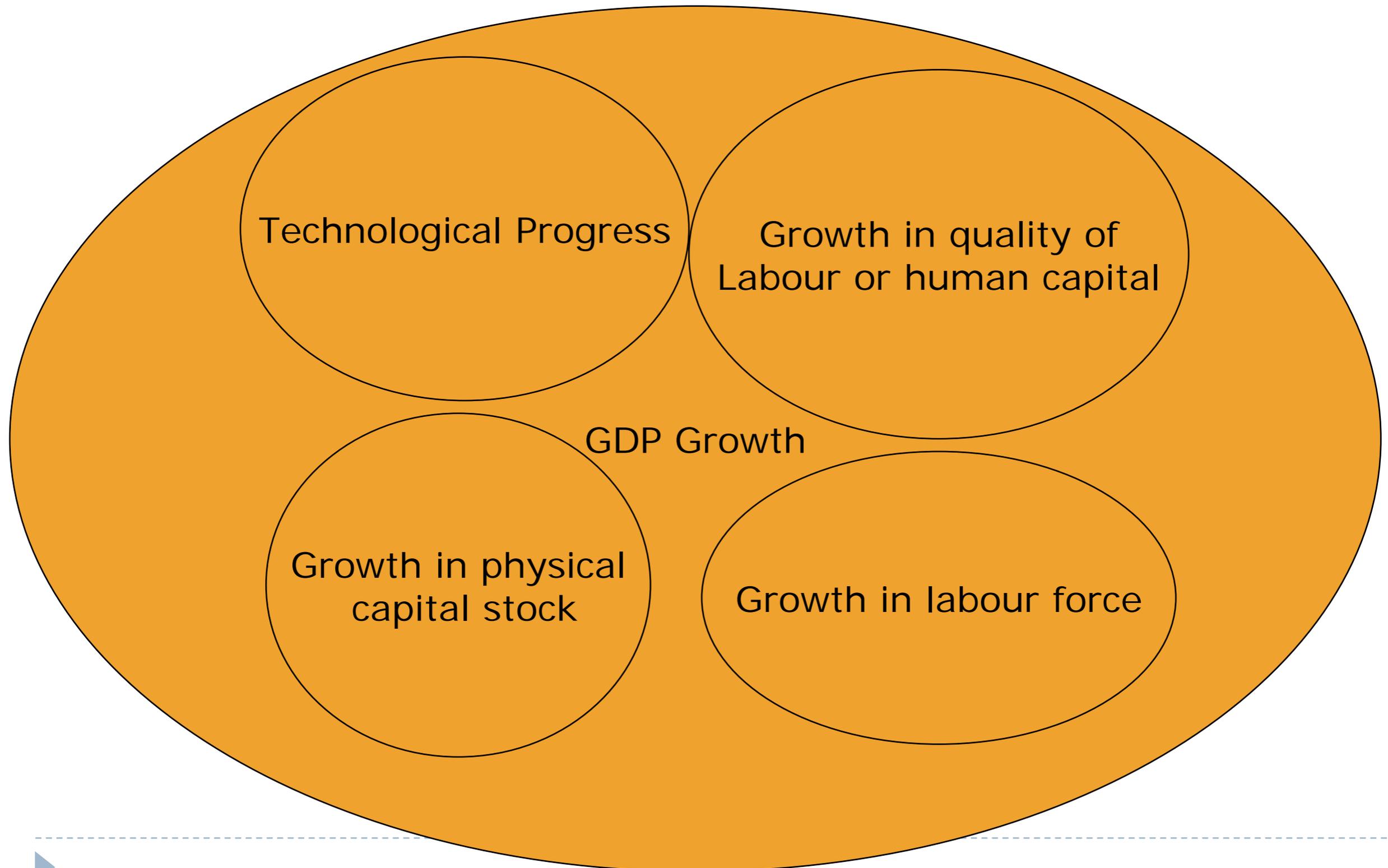
Economic Statistics

- ❖ Economic statistics are observed data conforming to economic concepts on measurements, covering a wide spectrum of variables on output, input, costs and prices, employment, trade, finance, budget and so on, considered relevant for explaining the economy, regions or any issue relating to the economy. These data can be grouped in different ways. System of National Accounts under the careful aegis of the United Nations Statistics Office and other international organisations involved in development of standard on statistics provides the basic framework for organisation of economic statistics keeping in view their use for analysis.
- ❖ However, the ambit of economic statistics is much broader.

Components of GDP (%)

Sr. No.	Components	1951-2	1961-2	1971-2	1981-2	1991-2	2001-2	2015-16*(GVA)
1	Agri. & allied	52.7	42.1	40.6	34.4	29.6	23.2	15.4
2	Industry	12.9	16.4	16.9	21.1	20.5	19.6	22.7
3	Services	34.4	41.5	42.5	44.5	49.8	57.2	61.9
3.1	Construction	2.5	3.8	4.7	4.5	5.2	5.8	8.5
3.2	Trade, Hotels etc.	9.4	11.9	12.9	16.8	18.9	22.7	19.2
3.3	Financing, Insurance etc.	11.7	13.8	12.4	10.7	12.4	14.0	21.6
3.4	Comm., Social Services etc.	10.8	12.0	12.5	12.6	13.4	14.8	12.6
	Total	100	100	100	100	100	100	100

GDP growth – supply factors



Key Macroeconomic Variables

← GDP = Production – Intermediate Consumption

= Wages + Profits + Other factor payments

= C+S+G+ Net X (excl. net income from abroad) = Y

Including Net Income from Abroad, we have

○ GNP (Demand) = C+I+G+X-M = A (Absorption)

← $Y_d = C+I+G+X-M-T$, where Y_d is disposable income.

← If we denote private saving as $S = Y_d - C$, and rearrange

← $X - M = (S - I) + (T - G)$

← Current account balance = Net saving/dissaving of private sector + Government fiscal deficit/surplus.

← This shows that the equilibrium level of national income is determined where injections (left side) are equal to leakages (right side).

← An efficient market needs efficient information system.



Macroeconomics – Distribution Ignored

- ← **We know that total or average per capita GDP, including sectoral break-ups, does not truly reflect much due to highly skewed income distribution, which is heterogeneous over time and space. There are variations in agent preferences, skills, capital accumulation and use, factor endowments etc. which contribute to heterogeneity. The cultural diversity also impacts agent response and environment for production. In short, in a country of India's size there are many complexities which are relevant for deeper insight on how the economy responds to causal factors and inducements.**
- ← **As the ultimate beneficiaries of progress are expected to be the people belonging to all sections, it is very much necessary to know how benefits of growth accrue to them. A cardinal principle of economics is the search for 'laws governing the creation and distribution of social wealth'.**



IMPORTANCE OF AGRICULTURE AND CHALLENGES

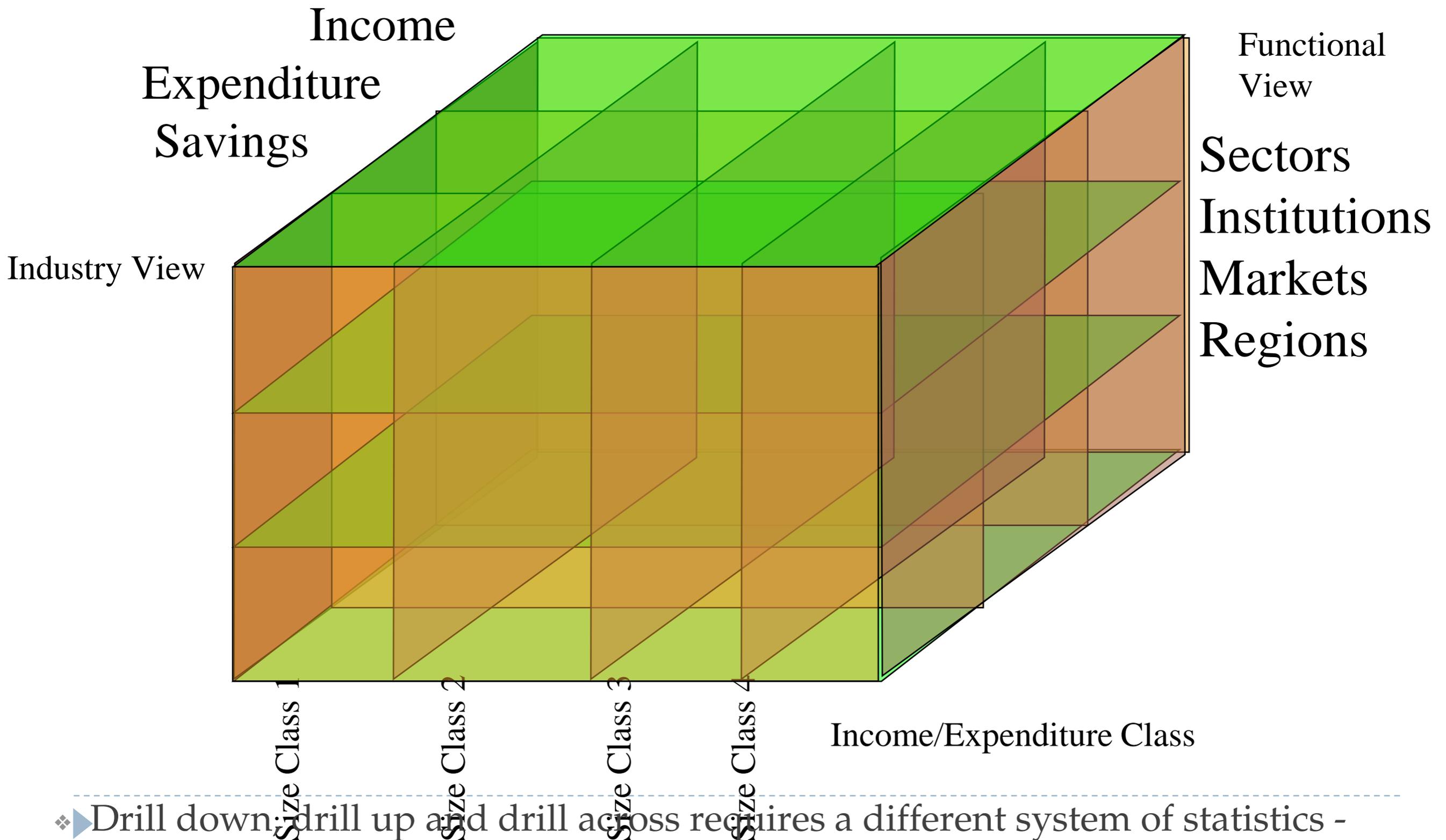
- ▶ Agriculture plays a pivotal role in India's economy. Achievement of self sufficiency in food-grain production is great.
- ▶ Though agriculture contributes 15% of GVA , over 50% of workers depend on this sector. Most of India's poor are stuck up here.
- ▶ We have 85% of farmers as small and marginal. A Situation Assessment Survey of farmers (2003) showed that 94% of farm households owning less than 4 ha were in income deficit. Agricultural labourer and marginal farmers are worse off.
- ▶ In 2012, the average yield of paddy was 3,721 kg/ha in India compared with 6,775 kg/ha in China. Average use of fertiliser in India was 165 kg/ha while in China it was 450 kg/ha in 2011.

Flow of Funds – Basic Approach

			Domestic Assets and Liabilities Matrix by Balance Sheet Approach								
			General Government			Financial Sector			NFC	HH	RdW
Issuer of Liabilities (Debtor)			A	L	NP	A	L	NP	AL/NP	AL/NP	AL/NP
Holder of Liabilities (Creditor)											
Currency and Deposits											
Securities other than Shares											
Loand											
Shares and other Equity											
Insurance											
Financial Derivatives											
Other Accounts Receivable											



What new information age offers?



- ❖ ▶ Drill down; drill up and drill across requires a different system of statistics - bottom up for building the system, top down for strategy and policy.

NSS – Four levels

Country

State

District/Taluka

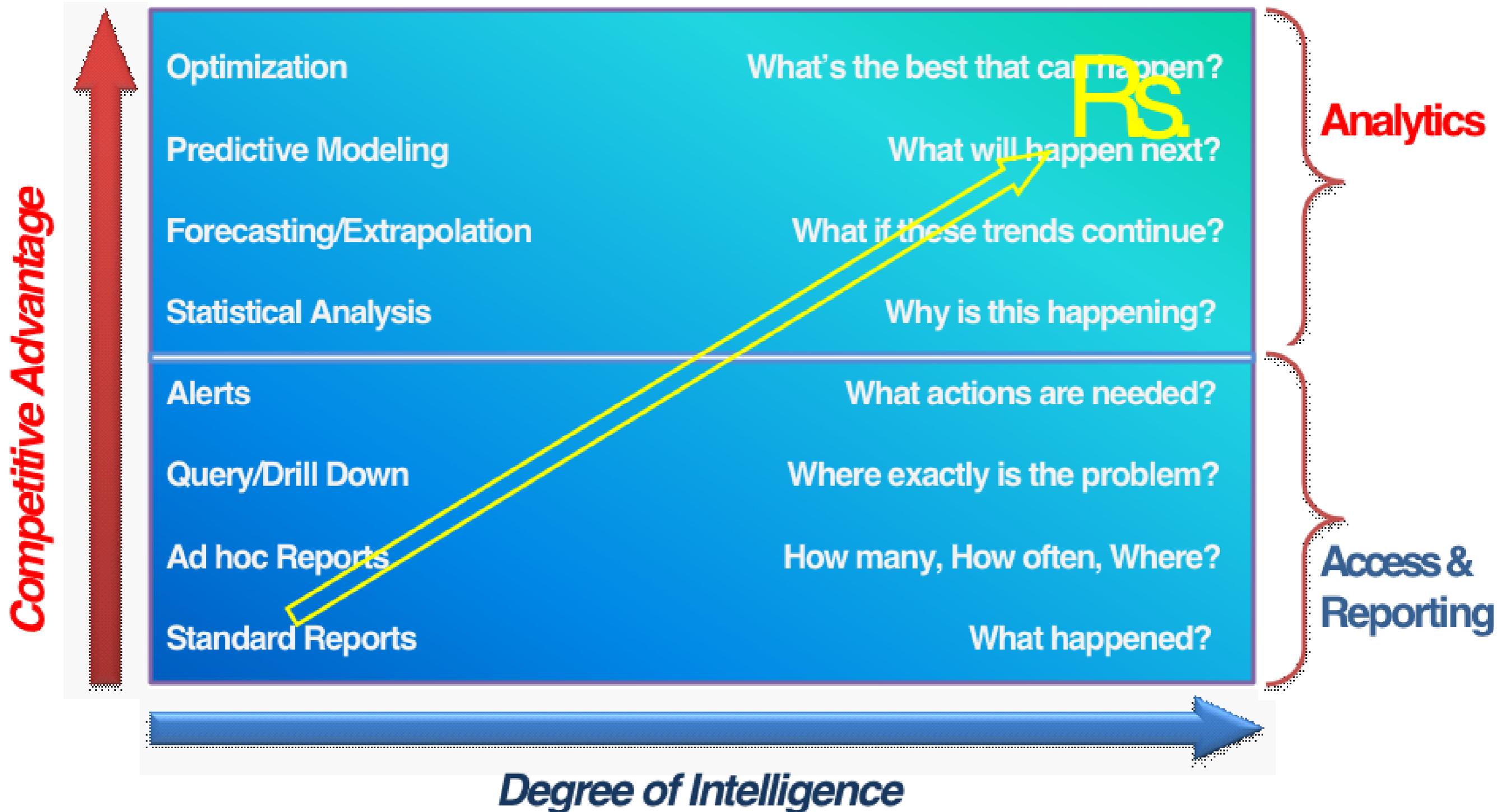
Village Panchayat



Key Analytics

- ❖ Statistics on Output, Input, Price, Capital, Labour, Trade, BoP, Financial, Fiscal Sectors classified by industry, institution etc. - GeoSpatial Distribution
- ❖ Productivity is a key source of economic growth and competitiveness, raising income - Central for assessing economic performance
- ❖ Link between productivity, trade and international competitiveness

Competitive Advantage of BI & Analytics



Data Scientist

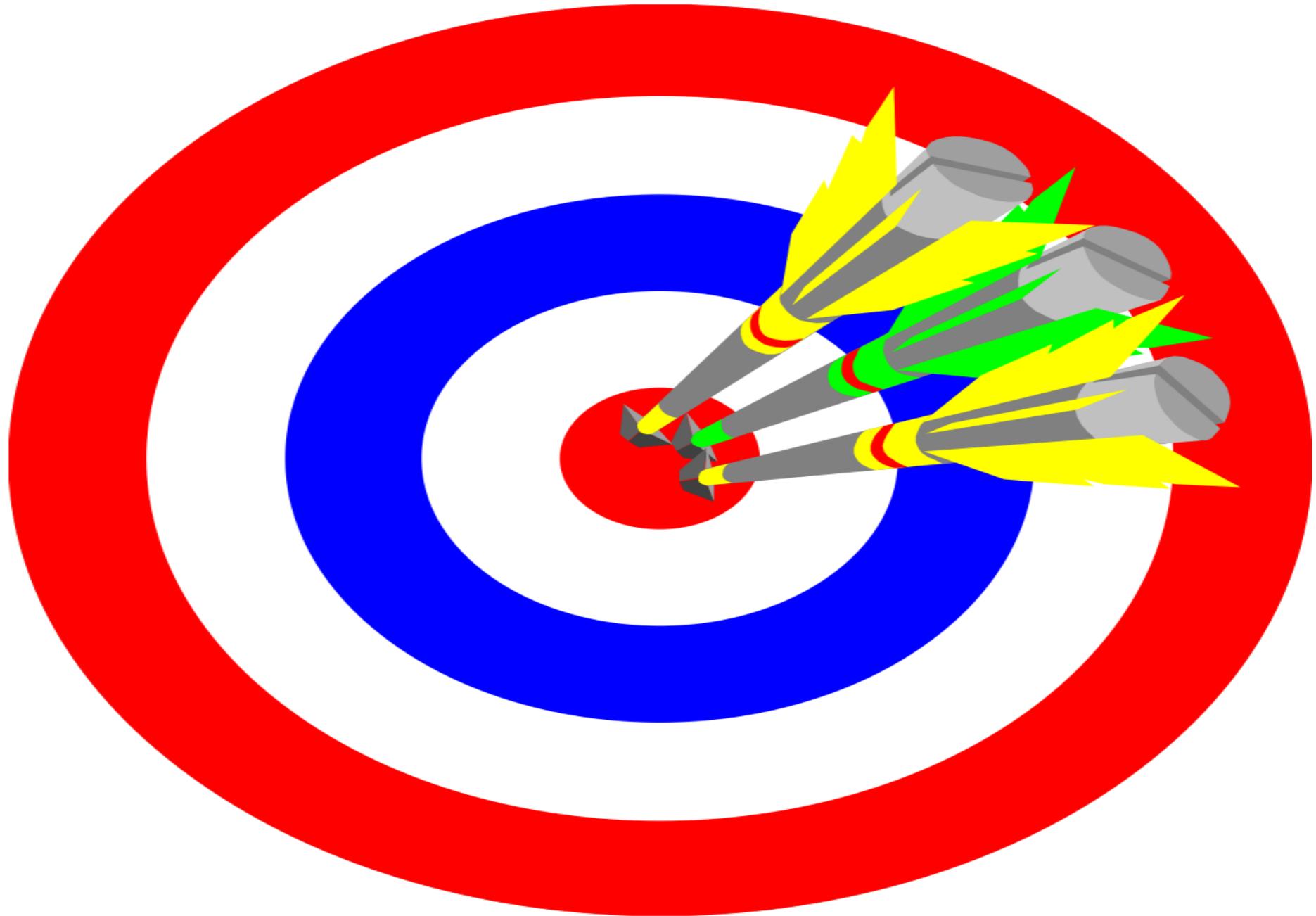
- ❖ Data scientists are big data wranglers. They take an enormous mass of messy data points (unstructured and structured) and use their formidable skills in math, statistics and programming to clean, massage and organise them. They apply all their analytic powers - knowledge of economy, industry knowledge, contextual understanding, skepticism of existing assumptions - to uncover hidden solutions to business challenges.
- A data scientist is someone who is better at statistics than any software engineer and better at software engineering than any statistician. statistician.

How to raise income, sustain development?

- ❖ 'If by a miracle' sighed Gunnar Myrdal, 'the cultivators in South Asia could be induced to work more diligently, production would rise dramatically'. Sen observed, 'four sets of structural factors will constrain employment policy: (1) technological possibilities, (2) institutional features, (3) political feasibilities and (4) behavioural characteristics'.
- ❖ Extract huge volume of data from multiple internal and external sources, analyse them to study patterns and dependencies, understand what works to raise productivity.
- ❖ Suggest data-driven solutions for raising productivity, competitiveness; find cost-effective solutions.

Concluding remarks

- ❖ Markets on their own do not ensure socially desirable outcomes due to various imperfections. Government intervention requires inputs on reality - empirically measured.
- ❖ Efficient market assumes efficient system of information. Government has a major responsibility to disseminate information for contributing to this efficiency.
- ❖ Private enterprise requires credible information to take informed decisions.
- ❖ In a welfare state the citizens want to know how implicit contract between them and the government is discharged. Official Statistics as public good, with independence, is expected to provide credible information to the people to serve this purpose.
- ❖ What we, as government statisticians, contribute to the society as public servant? It is not only to assess by way of metrics but also to participate to *change society*.



Thank You !

