ISSN 0972-1185

ARTHA BEEKSHAN

JOURNAL OF BANGIYA ARTHANITI PARISHAD
(Bengal Economic Association)
ASSOCIATE MEMBER OF THE INTERNATIONAL ECONOMIC ASSOCIATION

Vol. 26 , No. 3

December 2017

Contents

ARTHA BEEKSHAN

(Journal of the Bengal Economic Association)
Reg. No. 53099/92

Artha Beekshan is a quarterly referred journal in economics and allied subjects published by the Secretary, Bangiya Arthaniti Parishad. Contributed articles relating to research in economics and allied subjects are considered for publication by the Editorial Board. The reviews of books and monographs are also often published in this journal. In 2013, the journal was selected by ICSSR as belonging to the set of top 210 social science journals in India, and indexed regularly. Authors should follow the guidelines, appended in the volume, before submission of their papers. The publisher shall not assume any responsibility to share the views of the authors contained in their articles.

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BANGIYA ARTHANITI PARISHAD
(Bengal Economic Association)
[Associate Member — International Economic Association]

Office :
Bangiya Arthaniti Parishad, 87/277, Raja S. C. Mallick Road,
Ganguly Bagan, Kolkata - 700 047.

Artha Beekshan, Volume 26, No 3, December 2017

Publication of ***Artha Beekshan***, the quarterly referred journal of Bangiya Arthaniti Parishad, that is, the Bengal Economic Association, is one of the most important academic activities of the Association.

The present volume, **Volume 26, No.3** of the Journal, is published containing the selected papers contributed by scholars and invited papers.We are thankful to the authors and members who have helped in one way or other in the preparation of this volume.

I would like to extend my whole-hearted thanks to the Editorial team, the Publisher, and all who have helped in the publication process, and especially the office bearers of Bangiya Athaniti Parishad for their kind endeavours to make this issue of **Artha Beekshan** viable and **Kolkata Mudran** for bringing out the present issue.

Editor in Chief

Certificate of Registration

1.	**Name of the Journal**	**:**	**ARTHA BEEKSHAN (Journal of Bengal Economic Association)**
2.	**Registration Number**	**:**	**53099/92**
3.	**Language**	**:**	**English**
4.	**Periodicity**	**:**	**Quarterly**
5.	**Retail Selling Price**	**:**	**Complementary for Members**
6.	**Publisher**	**:**	**Secretary, Bangiya Arthaniti Parishad**
a.	**Nationality**	**:**	**Indian**
b.	**Address**	**:**	**87/277, Raja S. C. Mallick Road, Ganguly Bagan, Kolkata - 700 047.**
7.	**Editor in Chief**	**:**	**President, Bangiya Arthaniti Parishad**
	a. Nationality	**:**	**Indian**
	b. Address	**:**	**87/277, Raja S. C. Mallick Road, Ganguly Bagan, Kolkata - 700 047.**
8.	**Printing where printing is conducted**	**:**	**Kolkata Mudran , 12, Biplabi Pulin Das Street, Kolkata -700009, Phone: 033-2354-6891.**
9.	**Place of Publication**	**:**	**Ganguly Bagan, Kolkata – 700 032.**

Artha Beekshan, Volume 26, No 3, December 2017

LEARNING BY TEACHING*

Dipankar Dasgupta[1]

This being the first in my life that I have been called upon to deliver a valedictory lecture, I was not entirely sure what I was expected to talk about. Although I was vaguely familiar with the word valedictory, I decided nonetheless to look up a number of dictionarles to ensure that I was not about to commit major mistakes. Most of the dictionaries I consulted agreed that a valedictory lecture was a farewell address. While this helped me feel more confident of the job I was expected to perform, it didn't help clear up my doubts entirely, since I kept on wondering who or what it was that I was expected to bid farewell to. It was an unnerving thought, for by the time you are as old as I am, there is very little left to bid farewell to. Except, you know what.

My problem was resolved somewhat when I read the second letter that Professor Biswajit Chatterjee had sent me. On behalf of the Parishad, he informed me in this letter that a title of sorts was about to be conferred on me. The title of the teacher. I thank your organization for this kind gesture from the bottom of my heart, especially so, because I had decided to choose a teacher's profession way back in time, when I was a mere school boy. I was fortunate enough to be taught by Utpal Dutta in school well before he turned into a professional actor. He used to teach us English language, literature, grammar and everything else connected to the language, and still dwells in my memory as the greatest teacher I have ever come across. I tend to believe till this day that it was he who was the original inspiration underlying my choice of a teacher's career.

Of course, I didn't choose to specialize in English language when the question of a profession came up. I joined an undergraduate college as a student of economics and there too was blessed by the presence of Professor Bhabatosh Dutta, Professor Tapas Mazumdar, Professor Dipak Banerjee, Professor Nabendu Sen and others. All these teachers kept me mesmerized in their classes, through I have to admit that it was invariably their teaching skills that attached me more than the material that I was supposed to master. There was a contradiction in this, since I wasn't exactly what you might call a bright student of economics, but I was almost certain that, given an opportunity, I could well enjoy myself as a teacher of that very same subject.

My confusion surrounding the subject matter of this valedictory lecture was cleared up finally when I recall these events in my life. I decided to share with you today my personal

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* Valedictory Address in the 37th Annual Conference of Bangyia Arthaniti Parishad at Prabhu Jagabandhu Collage, Howrah on 16.9.2017

1 Former Professor of Economics, ISI, Kolkata & New Delhi

experience with teaching and most importantly what I ended up learning from it. I am no longer formally associaed with teaching, but Professor Chatterjee's letter draw my attention to the fact that I had never managed to bid it a proper good bye either. I decided therefore, after consulting Professor Chatterjee and Professor Ashis Bannerjee, to use this occation to address that incomplete task . Many or most of you present here today are teachers yourselves and I am almost certain that you will agree with me if I said that a teacher's success depends largely on what she or he learns from students. An inquisitive and a critical student is the best kind of student a teacher can hope for. When I was a young teacher, the truth didn't reveal itself to me as lucidly as it did in later age. Teachers often make mistakes and, if they are lucky some student of the other points them out in a full class. Such incidents used to cause me enormous embarrassment when I was new to teaching and I recall occasions when I attempt to cover up my shallow understanding or even errors by quickly clearing yet other mystifications, there by causing immense damage to the students.

Over time though, I learned that the best response to a student who asked uncomfortable questions was to beg for time. All that a serious teacher needs to do is to tell the student that he is not entirely sure of the answer, but will certainly think about it and bring it up in the next or the next to next class. A teacher who sticks to this points begins to think what went wrong. More importantly, the teacher ends up understanding the subject matter a little better. As I said, I was never a bright student of economics going by examination scores, but I think that over time I learned a great deal by facing my students as honestly as I could.

I did teach somewhere abroad before I joined the indian statistical institute, but today I shall confine myself mostly to my ISI experiences alone. I began my teaching career with two courses, the first was general equillbrium theory and the second abstract liner algebra. I had been trained in the first of the two subjects, but abstract liner algebra was a most challenging course to teach. I was new to the subject and made a whole lot of mistakes while teaching it. I still remember some of the students who kept me on my toes. At least one of them is most well-known now and holds a Chair Professorship in a US University. By the time I was teaching the course a second time, I had earned reasonable confidence and this is turn helped a great deal with my understanding of liner economic models, which was a third course I was asked to teach. A story readily comes back to my mind in this context. Those were the days when people were still concerned which generalizing the non-substitution theorem and during the early seventies, Leif Johansen had come up with a proof of the theorem in the journal of Economic. Theory that allowed for continuous substitution possibilities in production. Like the isoquants we teach in micro courses, there were uncountably many activities in Johansen's version of the Leontief model, as opposed to a standard finite set representation.

Being an ambitious teacher, I decided to try and teach the paper in my linear models class. I prepared my lecture and presented the proof to my students. But some of them at least were not convinced that I was presenting a correct proof. They pointed out the problem to me and I couldn't fix it straightaway. I come back to my office feeling depressed and kept on staring at what I had failed to pass off. The matter turned out to be pretty intricate and finally I gave up trying to teach the paper.

In my own secret lair, however, i didn't exactly relent, I kept on studying the Johansen proof for the rest of the semester and finally produced a simple counter-example to his argument. His proof was not correct and it was a student who had given me the courage to question it. Once I had my counter-example, I needed to produce a correct proof of course, which I finally managed to work out. As I progressed, I figured out that the non-substitution theorem was far more general than I had ever imagined it to be. In particular, the correct proof led me to the discovery that labor coefficients need not be bounded away from zero for the theorem to be valid. Amongst other things, it meant that yet another paper, one by Malinvaud on decentralized plans, could also be generalized. Carl Shell, who was the editor of the journal, accepted and published the paper. This made me happy of course, but I never forgot that it was my experience as a teacher who had tripped in his class that landed my paper in the coveted journal. Needless to say, I got back to the students to whom I owed this paper and finally offered them a correct proof of the result.

Simultaneously with all this, my general equilibrium classes continued and soon enough I came across Grandmont's work on temporary general equilibrium, which was my first ever encounter with meaningful stochastic general equilibrium models involving more than one period of time. The standard general equilibrium models at the time were also multi-period models, but the Arrow-Debreu dated and contingent commodity structure produced an equilibrium for all the periods in orie go. John Hick's classic work, Value and Capital, had, on the other hand, looked at the problem differently. People make decisions today on the basis of unclear knowledge about what might lie ahead. Hicks therefore looked for an equilibrium that would hold in the current period alone. Equilibria for subsequent periods evolved over time as more information became available. The economic world was a sequence of temporary equilibria. Grandmont produced a tractable model of Hike's idea and soon enough a colleague and I were teaching this model to students. The models were mathematically demanding and required one to be familiar with a good deal of Topology and Measure Theory. Trying to teach the latest advances in general equilibrium theory forced me to grapple with these mathematical tools as well and, once again, it led us to publish two papers generalizing Grandmont's work.

The general equilibrium theory of the Arrow-Debreu variety didnot offer any interesting theory of distribution. They represented private ownership economics, were shares of

individuals in firms were none responsive to market forces. Jacques Dreze had looked at this problem and produced a compititive equilibrium that was a best quasi-Pareto efficient if agents were allowed to trade in shares. These raised questions surrounding the theory of distribution in standard general equilibrium models. Around the same time, cooperative game theory had just about arrived and the Shapley Value was a much discussed concept. The most interesting aspect of shaply value was that it had implications for the theory of distribution which went far beyond the accepted theory of compitative general equilibrium. It offered a rigorous theory of distribution even in the face of increasing returns. But Shaply was not the only game theorist who gave us a workable theory of distribution, one that didn't conflict with the Fundamental Theorems of Welfare Economics. Amongst others David Schmeldler had come up with a new concept, the nuclieolus, that could do exactly what Shaply value did, but in addition had many similarities with the marginal conditions of neo-classical Economic Theory.

These ideas naturally invaded the courses we taught and there was once again and opportunity of learning by teaching. Our courses led quite naturally to a marriage of general equilibrium theory and cooperative game theory. One of the earliest works in this area of a paper by Sondermann (Journal of Economic Theory in 1974). Trying to teach this paper brought up questions from students and led us to write a paper that ran parallel to Sondermann's work. The paper, which was called power and distribution of profits and dated 1976, remained unpublished, though, to my surprise recently, I discovered that it had made its way to the Google citation list.

It was around now that I transferred from the ISI, Delhi campus to ISI, Kolkata and this is when the most difficult part of my teaching career began. The reason of simple enough. Neoclassical economics was shunned by Kolkata's established economics. It was not even taught were I worked. Instead, it was classical political economy, Smith, Recardo, Marx, Sraffa and others that the students learnt. I did read up some of these classics to educate myself, but they were hard to teach and my teaching-learning process received a blow. The only kind of teaching I was engaged in for a while consisted of guest lecturing on general equilibrium theory at Calcutta University where neoclassical economics was not an object of taboo. There was little scope for teaching anything at all in ISI itself where, much to my discomfort, I was earning my salary. The research I did could possibly have defended my salary, but all the research I had ever done till then had been motivated by the courses I taught. This was a difficult issue to resolve. However, I found a partial way out of the difficulty.

Liner Economic Models was one of the courses that the ISI syllabus permitted. I expressed my interest in teaching it. Permission was granted and I began teaching the staff I used to teach in Delhi as well, but used the opportunity to add on Sraffa's work to the course programme.

I could see that the first part of Sraffa resembled the Leontief model, but I also sensed that the resemblance was superficial. Soon enough, with helpful inputs from my close friend and classmate Arup Mallik, who passed away recently I figured out exactly were Sraffa and Leontief differed and this was my first true exposure to classical political economy. Sraffa's prices, I realized, had no relationship at all with the neoclassical resource allocation problem but were generated entirely by the Ricardian approach to Income Distribution thoroughly. To put it differently, the question of proving a non-substitution theorem did not arise in Sraffa all. I was reasonably well acquainted with the neoclassical theory of distribution. Teaching Sraffa opened up a totally new world for me, through, it did not led to research output, primarily because Saraffa left no open endedness in his no joint production model, preventing one to proceed further. His joint production model of course remains unresolved till this day, but I was not attracted towards that line of research.

A possible reason why I did not proceed with Liner Models could have been my newly developed interest at the time in Keynesin macroeconomics. Kolkata had several active practitioners in macroeconomics, Professor M.K. Rakshit being the most noteworthy of them. Given my general equilibrium background, macroeconomics was a totally foreign teritorry for me. However, the policy issues it was concerned with appeared to be intresting and I felt they were worth pursuing. As always, I began teaching the course. The first time I thought it, I ended up in complete disaster. I tried to use Lawrence Kleln's The Keynesian Revolution to introduce the students to macroeconomics and produced dense confusion at best, both for the students as well as myself. During the same period, through, I tried to read up Keynes' General theory as well and though this was no easy task, I think it helped me understand what I should not do if I wished to teach macroeconomics. And this was not teach Lawrence Klein's books again. There is no point going into the details of how I resolved the problem, but this is a period of my teaching career that I remember foundly, mainly because of my association with Professor Rakshit. Professor Rakshit and his seminar group met regularly at Presidency Collage and our discussions, backed up by classes I thought at ISI, produced a series of papers surrounding macro theory and policy, the most hoteworthy amongst them was the work we did on procurement prices and effective demand.

Unfortunately through, we did not pursue the new macroeconomics that was developing at the time and my understanding of the subject has consequently remained somewhat incomplete. Besides, I was back to game theory, non-cooperative this time. It happened to be a single instance of my tryst with economics that had no link to teaching. A colleague in a university I was visiting abroad got me interested in the topic of public goods and the literature on voluntary contribution to public goods. We worked and published in the area and that reminded with me from that exposure was the public goods problem more than game theory. It played an important role in what I taught and researched on subsequently, pretty much till the end of active career.

I was back to teaching macroeconomics in ISI, Delhi now and deciced to go beyond Keynes. This led me to the literature on new growth economics. It was highly non-Keynesian and brought me back once more to neoclassical general equilibrium theory of the Solow variety, as amplified by Lucas, Romer, Rebelo and others. I thought and learnt the subject with great interest. Due to presence of internalizable externalities or other reasons, new growth theory invariable comes up with the divergence between competitive market equilibrium and the social optimum, A public good kind of problem therefore lurks their most of the time. There was room for policy here too. And, importantly enough, there was room for understanding the structure of continuous time optimal growth theory for infinite horizon problems. In other words, there was plenty to teach and learn and keep me busy.

It took me great deal of time to prove to my satisfaction the necessary contributions for an infinite horizon optimal path. Sufficient conditions has proved long ago by David Cass in Econometrica. However, I failed to locate an acceptable proof of the necessary conditions for a year or to and then decided to prove them myself, or else I would have been cheating the students. My proof involved a compromise concerning the differentiability of the value function which I simply assumed, but I knew that this result too had been proved by Schelnkman and Benveniste, The mathematics for the letter paper was quite a challange to teach in my classes and I avoided it.

New growth theory was the only part of new macroeconomics that I seriously spent time on and soon enough it was time for me to retire from the ISI. Fortunately through, teaching the subject produced paper and a book and I was satisfied that I was still stuck to my learning by teaching model.

I was primarily concerned with economic theory during my teaching career. I taught a good deal of mathematics too, mostly in the areas of abstract linear algebra, dynamic programming and point set topology. There were minor exceptions of course when I got involved with empirical investigations, one of them being study of interstate divergences of growth rates in India. This was a group effort and including a student from my Calcutta University days. He teaches now in the IGIDR. Apart from this work, there is nothing more worth mentioning about my empirical investigations.

Well, that sums up more of less how I spent my life as a teacher. New areas have developed in the meantime, one being Law and Economics and yet another recent one being Behavioural Economics. I feel tantalized by them and even try to read up some of the interesting literature in thee disciplines. I don't think they will lead me to teaching anymore, but learning will surely continue. The fact that the Bangiya Arthiniti Parishad is honouring the teacher part in me is a matter of gratification needless to say. I end up therefore by thanking the organization once more, its office bearers and its members for the affection they have showered on me.

Sayonara is a sad word in the Japanese language but I do not hesitate to use it here today. If anything, you have made me profoundly happy.

Artha Beekshan, Volume 26, No 3, December 2017

MONETARY THEORY REVISITED[1]

RATAN KHASNABIS*

I. Dr. S. N. Sen : My Teacher

Dr. Satyendra Nath Sen had been my teacher, a direct teacher in the Economics Department of Calcutta university when I was there a post graduate student. A Khaddar-clad gentleman with sharp eyes, he was then possibly in his late-fifties, serving as the Head of the Department with proper command over everything in Kantakal campus where Economics Department was located. By the time I entered Kantakal as a student, I was an intellectual rebel. It is still a puzzle to me, but I must admit, he used to appreciate me. In political belief or, to put it in proper way, in the realm of ideology, we were them in opposite poles. Sometimes, I had the opportunity to travel with him in his car from Kantakal to College Street campus, and during the entire period we used to debate – not on any issue of economic theory but on 'politics'. It was never a bitter exchange of malicious words, rather a game of wits in which he used to indulge me. I realized, in due course that he had a sense of appreciation for that young rebel. I must admit, I had received a lot of support from Dr. Sen. Some of them are so private that I cannot share these with others in a public domain. Without a subtle appreciation for that rebel, all these could never happen. Of course, he never received anything in exchange. I am sure, he never expected this either. As I grew older and found time to look back, I realized I should pay something as my homage to this extra-ordinary academician of a generation which had the conviction that the frontier of knowledge expands as the intellectual rebels are received with some indulgence in the seats of higher studies. When I received the invitation from Bengal Economic Association to deliver a lecture in memory of Dr. S. N. Sen, I realized, here is an opportunity to pay my homage to my Acharyadev Prof. Satyendra Nath Sen. I could not say no. On the contrary, I decided to grab this opportunity and prepare a lecture setting aside other commitments for the time being. My heart–felt thanks to Bengal Economic Association for offering this opportunity to me.

II. My Journey to the World of Monetary theory with Prof. Sen

In Kantakal, Professor Sen used to teach theory of money in our class. The central theme was the relation of money with macro variables in the real sector of the economy. The panorama was confined to so called 'mainstream economics' in which Marx, Ricardo or even Adam Smith had no place. Money, under this dispensation had been 'high powered money'. As medium of exchange paper money was fast replacing bullion or other 'costly'

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1 S.N.SEN Memorial Lecture , 2017, delivered in the 37th Annual Conference of Bangiya Arthaniti Parishad,September 15,2017

materials having some intrinsic value. Otherwise , worthless bits of paper whose cost of production had in no way been linked with the 'value' that it enjoys in the market had gradually occupying the drivers' seat in the money market. Prof. Sen had not seen the zenith of this development when money was, in fact, officially be linked with gold and the 'price' of this otherwise worthless piece of paper was being determined even in the international l market by just its 'demand' and 'supply'; the worthless piece of paper was even being replaced with 'plastic card' and paperless transactions. The central issue with respect to monetary theory that we were taught at that time had implicitly recognized this power of money and quite correctly shifted the pivot of the theory or theories of money towards 'relative price' of money vis-à-vis prices of other macro variables, without trying to link these prices with the supply of a precious metal which could provide a simple explanation of 'price inflation' or 'deflation' – as it has been the *raison detre* of such developments in the early monetary history of Europe. Development of modern Economic institutions of capitalism, particularly the institutions of commercial and investment banks along with fiscal and monetary power of the capitalist states, there had been a sea charge in the operation of 'money' as an instrument in setting the relative prices of commodities including labour or 'labour power' (as a productive factor). It was also a reality that the stability of capitalism as a system of production in largely signaled by the stability of the 'price' of money. Moreover, the history of modern capitalism also point out that the system does not overcome a 'crisis' by anything which is *sui generis* to the institutions of market; it needs an external intervention and monetary instruments play an important role in this regard (increasing government spending – 'fiscal measure' in common parlance – is also operated by applying monetary tools to create extra demand or for 'bailing out' the lending institutions, as it happened during 2008-Crisis in the USA).

The economists of early 20th century were recognizing this role of money as a macro variable and the issue of 'stability' of relative price of money was gradually becoming the central issue pertaining to 'monetary economics'. The relation between the real sector and monetary sector was being explored further. With Walrasian mind set, the theoretical problem of the stability of the price of money (relative price vis-à-vis real sector including labour), the problem was apparently trivial. With free play of market forces, under general equilibrium, there will not exist any 'excess demand' or 'excess supply', full employment of every factor would be attained. Money market would also attain equilibrium and by definition, the 'price' of money would be settled. The stability problem with respect to 'price' of money should not receive any more attention. The policy prescription that followed would be on allowing the *tatonnement* process to play its role for which all the institutional barriers to 'free market must be removed.

Under such dispensation, thematically money is neutral to other (real) sectors. If money supply increases in a free economy where Walrasian general equilibrium has been

achieved, only the price 'level' will increase and effect would be inflationary, it will be deflating if the supply decreases. There will be equi-proportional effect on relative prices. Money is neutral to the function of variables in the real sector of the economy. Needless to say, money is just the medium of exchange. The equilibrium level of quantity of money in the economy would be determined by the total volume of monetary transactions that takes place in a turnover period multiplied by the general price level. This will be mitigated by coins, notes , bank deposits in stock – the so called "higher powered money. The physical amount of thin stock, required for transactions would, of course be lower because the same 'coin', or 'note' is used for more than one transaction – a phenomenon in the exchange economy which is technically described as velocity of circulation. Irving Fisher, in his book 'Purchasing Power of Money' described this phenomenon by **MV=PT.** This in fact is the first as initial description of the Quantity Theory of Money which is still taught in the class room in a course for the beginners on Monetary Economics. Needless to say, essentially this is an identity; the both sides describe the same phenomenon. For Walrasian general equilibrium model in which life is very simple, perfect knowledge on commodity in the market plays its due role, and thus risk or uncertainty in ruled out in every market, money should necessarily play a single role – the role of serving as medium of exchange and Fisher's Quantity theory is sufficient to describe the price of money which has to be stable once the general equilibrium in attained.

Of course, life is more complex. There are barriers to free market and the Walrasian model describes a long run truth in the market economy which is logically unrefutable. But then, the long run truth is based on the understanding that all barriers, including institutional barriers to free market would be removed in the long run. This is easier said than done. There are other economic factors, not reflected in Walrasian structure that creates stumbling blocks to free market in the true sense of the term. Most of them are rooted in the institution of private property that denies free access to resources that determine the level of production (and distribution). The rules of exchange are determined accordingly. The question of 'price' and 'equilibrium' in the exchange economy comes next. The requirement of institutional reforms signaled from market can be met only within the rules of property that the capitalist market economy would allow. The Walrasian logic has to operate within this limit.

Without entering in property issue, i.e., without entering in the discussion on institutional barriers to free market, in other words, without entering in the debate on barriers to free market that need reform for seeking answer to the problem of stability of price of money, attempts have been make and still are being made for solving the problem of attaining a finite (definite) and positive price for money which with be stable under the existing institutional arrangement. This needs to find a rationale for treating money as neutral to real sector of the economy so that money might serve only the requirement of transaction in the exchange market. As the debate started, Fisher's Quantity Theory equation was suitably

changed and the 'cash balance' approach to Quantity Theory of Money evolved via Cambridge (new) quantity theory. One of the exponents of this new theory of A. C. Pigou on who tried to utilize this concept for finding a clue for addressing the issue of stability. This in effect gave rise to the theory of 'real balance effect' which would find the rationale for holding cash balance only for transaction purposes, i.e., to justify the neutrality of money – the dichotomy between the real sector and the monetary sector of the market economy.

The contemporary reality during 1920s was, however, opposite to what the theory of money at that time was suggesting. The proportion of cash balance of high powered money in total monetary transaction, 'k' in Cambridge equation of the quantity theory of money was then being used for 'speculative purposes' as s well, and its share in total cash balance was fast increasing. There was a boom in the stock market and the expectation of getting high return as premium of holding cash was fast increasing. Ultimately, there was a crash in the stock market, bearish behavior with cash balance ruled over bullish behavior, and the real sector almost collapsed in the USA. Stagnation and unemployment in the real sector followed and gradually the era of 'Great Depression" set in. All over the capitalist world, there was crisis – general crisis of the economy which the contemporary theory of money failed to explain. It was also proved that value of money was never neutral to real sector. On the contrary, the stability of the value of money is necessary for the stability of the capitalist system.

J. M. Keynes theorized this development by recognizing the role of 'speculative demand' in determining the proportion of cash balance. This logically led to questioning the theory of neutrality of money and the dichotomy between real sector and monetary sector. Assuming that money is non-neutral, he developed a new theory of unemployment and stagnation. He did not put a critique on the given institutional arrangements. His theory just admitted a living reality, namely, the existence of wage rigidity. Why it should be do, in other words, why the distribution of the share of output between capital and labour is determined in this way, why the price flexibility does not operate there – had not been his concern in his theoretical construct. One may infer that he was considering a 'short run' phenomenon e where the Walrasian *tatonnement* process was not working in the labour market. Or else, one may as will argue that he was tacitly admitting that wage rate has to be determined by the bargaining power of labour vis-à-vis capital, there is no question of having any so-called 'short run' or 'long run' difference in this phenomenon. The rationale of this distribution theory is based on the economic theory developed by Ricardo and Marx where 'value' is different from 'price' and the distribution issue is settled at the level of creation of economic value.

Be that as it may, armed with the additional tools derived out of the new approach to Cambridge e cash balance equation for demand for holding cash and rigidity of money

wage, Keynes put forward a new theory within the ambit of the received wisdom of the subject at that time, which could explain the 'great depression' in a different way. The rationale for increasing government spending through fiscal measures, the essence of Roosevelt's 'New Deal' could thus be rationalized in the realm of economic theory. Keynesian theory gradually becaume the basis of the 'Macro theory of mainstream economics; the demand side factors received the due attention.

When Dr. Sen was teaching us monetary theory the era of best days of Keynesian Economics was over. The supply-side economics was gradually gaining ground, because of rising inflation and unemployment after the golden age of capitalism was over in the capitalist world. A look back to 'real balance effect' was suggested and Patinkin's reconstruction of 'classical dichotomy' was being discussed in the ''new' monetary theory. Dr. Sen was teaching this is our class and the rebel in me reacted. In private talks, Sir appreciated this without accepting my submission that the question of stability of the 'price' of money depends on the stability of its governing factor (not just demand and supply of money) which are located at the value creation level-a original point recognized by Smith, Ricardo and Marx. Sraffa's reconstruction of Ricardo's Value theory was then being discussed in academic journals, but Sir simply ignored it as the 'brain child' of Cambridge Radicals who were placing them outside the 'main stream economics', as he thought. I must admit at the same time that Sir had a liberal mindset – he appreciated the audacity to think differently. As an epilogue to this journey, I should point out that the debate on 'speculative demand' for money took a new turn in the following days when the theory of rational expectation was being advocated. Patinkin's interpretation of 'real balance' lost its significance. Briefly speaking, the theory argues that even if money is held as store of value, rational expectation about the future does not adversely affect the stability of the demand for money over time. Since money is used for transaction, its demand should remain stable. There is no theoretical rationale in developing a critique of it; money would remain neutral to the real sector of the economy. Dr. Sen was then busy with the administrative works. It was a turbulent time. I did not have any opportunity to discuss with him on the new theory justifying the (new) classical view of quantity theory of money.

III. The journey that still remains

As Prabhat Patnaik in his book 'Value of Money' has rightly pointed out, the theory of Rational expectation in internally inconsistent. Why should someone store money if the expectation is rational? Money is held because there is an expected return for holding cash. This in turn is based on the understanding that in some real sector, the condition of perfect price flexibility is violated. But this contradicts the monetarist's basic point, namely, money is neutral to real sector of the economy. Prices must be expected to remain sticky, at least in some areas of the real sector. Otherwise, what is the rationale for holding cash? The expected

return on holding cash cannot but be zero under perfect price flexibility .The theory is internally inconsistent.

The value of money has to be decided outside the market system. This is the only way to assign stability to value of money. For Marx, it is the labour they of value. Value of money is the labour embeded in money which was labour cost of production of bullion at his time. Bullion was of high value not because it was scarce, but because the labour cost of procuring gold or siliver was high. The exchange ratio at the value level was determined by the relative quantities of labour power embodied in each of them. There is a logical problem of transforming these values in price which he tried to solve by addressing the problem of 'transformation problem'. One must admit that he left the problem unresolved ,but that in no way questions his theory of distribution – the distribution is addressed separately, by the bargaining power of capital and labour. A reconstruction of the problem following the Ricardian labour theory of value leads to the same conclusion, as was pointed out by P. Sraffa in his book 'Production of Commodities by Mean of Commodity'.

A Keynesian answer to the stability problem is also based on the same type of logic. The value of money is decided by fixing its value with respect to one particular commodity, namely labour. This is done by allowing money wages to be rigid. The rationale of rigidity of money wages was sought from outside the Keynesian system. It is the anchor that provides s stability to the value of money also in Keynesian logic.

But neither Max nor Keynes could address a basic question. How does the system maintain its long term stability? I would explain the problem. If the value of money in anchored within a period (recall Keynes's short term static model or Marx's value theory), how is it maintained over periods? If the commodity prices are determined through *ex ante* nominal wages , and profit margin is settled by bargaining power between capital and labour, there will be a tendency towards accelerating inflation if the economy is pushed beyond a limit. No solution to this problem can be found by 'Philip's curve' approach to the relation between inflation and employment. The reality, however, is that the value of money remained remarkably stable across periods, even when the days of Bretton Woods Agreement had been over. There had of course, been 'crisis', but the system bounced back in course of time, there was no 'breakdown' of capitalism. How can it be explained within the theoretical construct where value of money is pegged with a money wage rate determined through negotiation between capital and labour in a static framework?

Other problem is rooted in the issue of 'steady state' under capitalism. The only stable steady state, as Kalecki pointed out, can theoretically be perceived under capitalism at a point where the growth rate is zero. But floor below which the economy cannot move, cannot be at a level of zero growth rate, at least for one reason – meeting the debt commitment.

For solution, one must go beyond 'closed economy' and extend the discussion on open economy macro beyond what is there in so called mainstream economics.

Patnaik's work contributes much in this area of macroeconomics. As Patnaik rightly pointed out, the theoretical puzzle can be solved by considering the fact that the capitalist economies could work with stickiness in wage rates for a long period without facing the problem of deceleration of growth rate at floor level. In case of any decline in the domestic demand , it could easily access the market in the periphery -the underdeveloped countries. In fact, the remarkable stability that currencies of the developed countries could maintain during the golden days of colonization, can largely be explained by this phenomenon. However, the power to extract raw materials at cheap price and even importing the wage goods at cheap price from the periphery, worked as shock absorber for price instability arising out of conflict between capital and labour. Needless to say, this could be kept economically viable by maintaining adverse terms of trade - adverse to the periphery. Economically, this was feasible because the bargaining power of labour market remained unorganised there, and therefore, the bargaining power of labour in the periphery was weak. The Kaleckian problem could thus be avoided. Inflation also could not touch a ceiling, as would have been possible in a closed economy with stickiness in money wage rates.

I think, the post 2nd world war phase when the big powers had to reconcile with the reality of de-colonisation, the economies, at least for first two decades could still maintain stability, because of post war reconstruction when 'new demand' was coming; there had been low inflation and growth rate never faced the problem of moving towards floor level. The problem, however, re-appeared when this phase of 'golden days' was over. Volatility was increasing even the money market, and ultimately dollar had to delink itself frown a fixed amount of gold for a unit of dollar. The law of demand- supply was working in the exchange market without gold or any precious metal at the beck of it. After or short while, dollar bounced back as the major international currency in open economy macro.

In fact, this was also a phase of financial globalization backed by full capital account convertibility of major currencies. Dollar faired remarkably well under this dispensation as well, ever though there had been increasing current account deficit that should logically lead to devaluation of dollar and high inflation. The USA could avoid this by its ever rising liability in the capital account. This was for several reasons, mostly, political. Be that as it may, this is bound to turn the real sector fragile. In fact, this is the basic reason for 2008 crisis. The crisis turned to a global crisis because the financial market is now a globalised market. Since money is non neutral to the real sector, volatility and stagnation are bound to take place.

Would it lead to collapse of capitalism? I do not think so. What will happen, and in fact it is already there, is that there would be new negotiation and re-negotiation between capital and labour on wage share. The era of globalization is also the era of 'outsourcing' of labour. Many jobs are silently being shifted from centre to periphery when the wags rate is low. There exists a vast reserve army of unorganised labour in the periphery where the jobs can be transferred with low cost of logistic movement, thanks to revolution in information technology; the wage rate there is low. Again, price of peripheral goods which are used as raw materials can be kept at low level maintaining adverse terms of trade – a reality since the colonial days. All these work as shock absorbers for price instabilities arising out of class conflicts in the developed hemisphere in determining the share of capital and that of labour. I should add that the working class in the developed countries is losing it bargaining power because of the threat of 'outsourcing'. The crisis of capital is silently being passed over to labour. The collapse of the system to this avoided. Capitalism survives with volatility and stagnation.

Artha Beekshan, Volume 26, No 3, December 2017

A Reconsideration of Gandhi and the Economics of Austerity*

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I. Friends, it is a great honour for me to have been asked to deliver this year's Professor A K Dasgupta Memorial Lecture. I express my sincere gratitude to the BangiyaArthanitiParishad for deeming it proper to ask me to perform this task, and I also specially thank my dear friend, Professor Biswajit Chatterjee, President,BangiyaArthanitiParishad, for initially writing to me for this purpose. I hope that I shall measure up to the confidence that you all have so kindly bestowed upon me.

To this learned audience this is something very well known, but let me nevertheless begin by sayingthat Professor Amiya Kumar Dasgupta (1903-1992) was indeed the doyen among economic theorists of India. If we begin to look at Indian economic thought from the nineteenth century onwards, there certainly were a number of major thinkers who made significant contributions to the subject, viz. Dadabhai Naoroji (1825-1917), Mahadev Govind Ranade (1842-1901), R C Dutt (1848-1909), Gopal Krishna Gokhale (1866-1915), among others, but none of them were theorists in the way we think of economic theorising in the tradition that we associate with, say, the classical or the marginalist schools. Among the other major pre Independence figures one would also have to consider the names of B R Ambedkar, BrijNarain, Jehangir Coyajee, Gyan Chand and V K R V Rao, among many other notable names, (see Krishnamurty (2009)), but, again, none of them were principally theorists.

In a particularly insightful piece, which was his Presidential Address,entitled 'Tendencies in Economic Theory', delivered in 1960 to the All India Economic Conference in Chandigarh, A K Dasgupta (1961, 2009)dwelt on this very question. He observes: 'Indian economists, particularly of the older generation, have been somewhat allergic to theory'. He goes on to add: 'This is surprising. The Indian mind is traditionally speculative and is supposed to lend itself more to abstraction than to crude reality. Are not our ancestors builders of philosophical systems which provide sustenance to thinking minds even.

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today?...If one looks at the history of economic studies in India, one is impressed by a certain lack of direction and system in them; useful as they are in their own way as 'description' of the Indian economy, there is little attempt in them at generalisation. It is remarkable how indifferent we have been to economic theory all these years' (Dasgupta, 2009, vol II, pp, 393-395).

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*11th Professor A K Dasgupta Memorial Lecture 2017, delivered in the 37th Annual Conference of Bangiya Arthaniti Parishad,September 15, 2017.

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Helpfully, Dasgupta proceeds to offer someplausible explanations. He suggests, first, that most of these thinkers were impatient with the liberal tenets of classical political economy which were at variance with the requirements of our economy, and in doing so they even repudiated the tools of analysis that it provided. The latter was highlydamaging to the progress of economic theory in the country. Secondly, he offers the view, based on his own experience, as a student of economics from 1922 in Dacca, and then becoming a lecturer there starting 1926, that even when economics came to be adopted as a subject for academic study, the influence of early pioneers persisted, and there grew a distrust concerning theory as such. Dasgupta then very perceptively adds: 'The fact that contemporary economic thought was dominated by the marginalist theory of value which was too far removed from the needs of our economy added to this distrust' (Dasgupta, 2009, p,394).

Later in the same 1960 Chandigarh address Dasgupta concedes that the old inhibitions were slowly disappearing. Starting in the mid-1950s, the contributions of some of the post-Independent generations of Indian economists, prominent among them being Amartya Sen, JagdishBhagwati, Sukhamoy Chakravarty, and then soon after, Amit Bhaduri, Prasanta Pattanaik, Partha Dasgupta, Avinash Dixit, to name just a few, were already making significant contribution to theoretical issues in areas ranging from social choice theory, pure theory of trade, optimum growth, capital theory, optimum taxation, etc. Indian names were now populating the pages of the most prestigious of Western journals such as Econometrica, Review of Economic Studies and Journal of Economic Theory.

A K Dasgupta's early engagement with the fundamentals of economic theory were worked out in the portals of the London School of Economics during the two years, 1934-36, he spent there. 'The desire to go to England for Ph.D. was a daring dream, if only he had absolutely no financial backing or patron' (see Alaknanda Patel (2009, p xxv) for a scintillating biographical sketch of her father).Dasgupta must have been exceptionally well focussed to complete his dissertation in two years flat. His doctoral supervisor was Lionel Robbins who had recently come out with his highly influential essay on 'The Nature and Significance of Economic Science' in 1932.

Those must have been exciting times at the LSE. Other than Robbins, there were Friedrich von Hayek, R H Tawney, and the young J R Hicks, Nicholas Kaldor and Abba Lerner, amongothers. For his dissertation, Dasgupta chose the topic 'The Conception of Surplus in Theoretical Economics' which was later published as a book in 1942 (Dasgupta, 1942, 2009, Vol I). In this study Dasgupta began by examining the foundational notion of surplus in classical economics, by carefully discussing the physiocratic notion of produit net and proceeding further on to the Ricardian notion of rent as well as the Marxian notion of 'surplus value'. He then went on to consider the Marshallian notion of consumer's surplus and then the notion of consumer's surplus in international trade. He concluded his comprehensive

and magisterial work by examining the notion of dynamic surplus contained in the work of Wicksell.

Throughout his active career which took him from Dacca to Cuttack, Varanasi, Washington, D.C., Delhi and Patna, Dasgupta's intellectual passion was substantially focussed on issues of pure theory. The topics he wrote on were varied. They could range from an incisive examination of 'Adam Smith on Value' (Dasgupta, 1960 2009, Vol. I) or it could be a theoretical formulation of 'Marshall's Measure of 'Net Benefit' from Foreign Trade' (Dasgupta, 1954, 2009, Vol II). As time passed his interest on theoretical economics gradually moved more towards the foundations of economic thought and he continued to be active well into his late 'seventies, and, in fact, came out with possibly his most significant work, 'Epochs of Economic Theory', when he was 82.

Two aspects of A K Dasgupta's intellectual engagement were particularly notable. Even though he had earned his doctorate at the highest citadel of academic learning for economics, the LSE, and continued subsequently to work on issues of pure theory, he was quite comfortable to publish his research work in Indian journals. There was nothing unusual in this for him. He was based in India and he was teaching or researching in Indian universities and research institutions. So it was natural for Dasgupta to publish in Indian journals without being fetishist about publishing in Western journals. It also helped that he was a classmate – from his student days in Dacca during 1922-26 - of that great editor and polyglot intellectual, Sachin Chaudhuri, who dared to start the Economic Weekly from Bombay, now Mumbai, in 1949, with the assurance of active intellectual support from his close friends, of whom A K Dasgupta was undoubtedly the most special.

It is possible that Dasgupta's research publications in Indian journals cost him a measure of international acclaim and recognition that should have been his due. This point has been underlined in the appreciations by Amartya Sen (1994) and Partha Dasgupta (2009) of the lifetime work of A K Dasgupta. Dasgupta had, for example, presented a truly pioneering analysis of the working of underdeveloped economies with surplus labour chronologically before the famous paper of William ArthurLewis (1954), but this fact has scarcely been acknowledged outside India.

Dasgupta had first given a lecture entitled 'Keynesian Economics and Underdeveloped Countries' (see Dasgupta, 2009, Vol II, pp 302-311) as an extension lecture under the auspices of the University of Lucknow in the autumn of 1949. A version of this was also published in the Economic Weekly in the Special Number, January 26, 1954. Lewis's well known paper on economic development with unlimited supplies of labour went on to become influential while most scholars in Europe or the US were barely aware of Dasgupta's work.Partha Dasgupta (2009, p.2) very rightly laments that even 'Textbooks on development economics

currently in use in Western universities (among the most prominent ones being those written by Indian economists!) make no mention of Dasgupta's paper when the Lewis model is presented'.

As mentioned above, after his long engagement, spread over more than a half century, with theoretical economics, Dasgupta published his tour de force, 'Epochs of Economic Theory'(Dasgupta, 1985,2009), when he was 82 years of age. This was a magisterial account of a dedicated scholar-teacher who had engaged keenly with the classical, marginal and the Keynesian systems of economic thought in all their detail as well as grandeur. Dasgupta's chief contention in the 'Epochs' is the idea that unlike the natural sciences, 'economictheory evolves in response to questions that are provoked by a given set of circumstances in an economy. As circumstances change, or people's attitude to them changes, questions are revised, and a new system springs up. It is wrong to say that the new system is an improvement on an older one; it is different. While in the natural sciences there is cumulative accretion of knowledge, Dasgupta offers the view that the nature of theorising in economics may be more appropriately categorised as being 'relativist' (Dasgupta, 2009, Vol I, p. 201; Nachane, 2009, Vol I, p. 27).

The second aspect of A K Dasgupta's extraordinary corpus of lifetime work points to a very significant development. After a lifetime of engagement with mainstream economic theory, in the twilight years of his life, he seems to have been attracted to Gandhian economics and the economics of austerity. Very interestingly, most of the mainstream theoretical economists of India in the post-Independence era seem to have shown no special interest in the ideas of Gandhiji. Interest in the social, economic and political ideas of Gandhiji might continue to attract historians, sociologists, political scientists and philosophers, but somehow mainstream economists seem to have been rather tepid towards Gandhiji's economic formulations. Gandhian economics is certainly not part of most university curricula, and it is possibly only some fringe elements among economists who might have any active interest in this system of thought. It should therefore be not a matter of any small interest to see why Dasgupta's concerns eventually moved in this direction. In the rest of this lecture it would be our purpose to explore this issue.

II. Alaknanda Patel mentions in her fond remembrance of her father: 'My father's admiration for Mahatma Gandhi, I realise now, went back a long way but we were too much in the modern world to notice it. …Anyway, if we had a hero other than 'Masterda', Surya Sen of the Chattogram Armoury Raid, it was Subhash Chandra Bose, not M K Gandhi. My father's way, however, was different; he believed in the path of negotiation, mediation and non-violence'. She goes on to write: 'In the last years of his life, the Mahatma and the concept of austerity preoccupied much of his thoughts. On March 19, 1991, he wrote to Partha Dasgupta, 'I have begun writing my promised monograph on a system of economics on Gandhian lines.

The progress is inordinately slow. I don't know when and, if at all, I shall be able to finish it. I feel convinced, with the strife and tension the world is experiencing, that the Gandhian way is the way, if our planet is to survive' (Patel, 2009, Vol I, p. xl).

Very much in the tradition of his doctoral supervisor Lord Lionel Robbins (Robbins (1932)), Dasgupta regarded himself as a theoretical economist who was concerned essentially with the positive aspects of economic theorising. When it came to normative matters he adopted 'a broadly utilitarian view of social life' (Partha Dasgupta, 2009, p. 6), informed by the New Welfare Economics of Hicks, Bergson and Samuelson. He acknowledged the logical difficulty that the Arrow Impossibility Theorem presented at a conceptual level to the process of social decision making but he saw no contradiction in dealing with the immediate choices facing any economy using his version of utilitarianism. As Partha Dasgupta further observes about his father: 'The closest he worked on the foundations of welfare economics was his book, The Economics of Austerity (Dasgupta, A K, 1975), but even there he sought to uncover the instrumental virtues of austerity in a poor world. He would have been embarrassed to preach austerity'.

Partha Dasgupta concludes his essay on his father with the following words: 'Among political leaders – anywhere and of any period – the one person he admired absolutely was Mahatma Gandhi, and he explained to me when I was a child why it is entirely appropriate to regard Gandhi as a Mahatma. He planned his final work to be on the economics underlying Gandhi's personal and social philosophy. He left handwritten notes behind. We are all the poorer that he was unable even to begin writing the book before he died in 1992' (Partha Dasgupta, 2009).

Describing the social and political proclivities of A K Dasgupta, I G Patel (2009, p. 11) observes: 'One could well imagine that the aversion to "Social Darwinism" and attraction to cooperation would lead Dasgupta sooner or later to Gandhiji and austerity and non-violent struggle'. On the occasion of the Gandhi centenary celebrations in 1969, Dasgupta had written: 'As one to whom it is pleasure now to recapture the thrill that he derived in his youth from the poetry of the Gandhi movement, I can perhaps best express myself, as we are celebrating the birth centenary of the Mahatma, by recalling the famous lines of Wordsworth:

Bliss was it in that dawn to be alive,

But to be young was very Heaven' (Dasgupta, 2009, Vol I, p. 82).

Searching through his writings on Gandhi in his collected works we find that there are three important pieces Dasgupta had on Gandhi (Dasgupta 1969a, 1969b, 1987). The first two were lectures delivered in the year of Gandhiji's birth centenary, when Dasgupta himself was 66 years of age. The last piece was a lecture delivered after the publication of 'Epochs' when

Dasgupta was 84. Then, of course, there is the very important small book of his on 'The Economics of Austerity', published when he was 72 years of age. This book emerged from the Lal Bahadur Shastri Memorial Lectures delivered under the auspices of the Banaras Hindu University in the spring of 1974. The Shastri Lectures, in spirit, bear some affinity with the three other lectures on Gandhi, though, as such, there is no necessary link.

This apparent dichotomy between Dasgupta's tract on austerity and his serious interest in Gandhi's conceptual framework should be no surprise at all. The tract on austerity emerges from the writings of classical masters, David Ricardo and John Stuart Mill in particular. Mohandas Karamchand Gandhi had not been a student of economics at all, and by his own admission he had not seriously pored over the corpus of writings of Smith, Ricardo, Malthus or Mill. Therefore one can well see why the lectures on austerity more or less stand apart from Dasgupta's brief writings on Gandhi's economics.

While he was still in South Africa, 35 years of age, the young lawyer, Gandhi, had been given a book by his friend Henry Polak in 1904. Gandhi read this book on a long train journey from Johannesburg to Durban. The book was 'Unto This Last' by John Ruskin (1903-12). As Gandhi later acknowledged, this book changed his life for ever.

In his book Ruskin challenged the formulations of the classical economists, chiefly Adam Smith, David Ricardo and John Stuart Mill. The foundation stone of Smith's formulation was based on the premise that individuals naturally pursue their self-interest. Smith claimed that it is this pursuit by millions of atomistic economic agents, which would ultimately, via, as it were, an invisible hand, have the unintended consequence of social cohesion and harmony. Ruskin believed that just as important as the pursuit of self-interest are the affections of human beings which constitutes an inner force. He believed that classical economic theory is used to deduce the laws of demand and supply which result in misery for workers.In this book Ruskin was advocating a system which brings about the good of all. For Gandhi, the most significant takeaway from 'Unto This Last' was the precept that 'the life of labour, that is, the life of the tiller of the soil and the handicraftsman, is the life worth living'. It is this moral view of the material world which formed the core of Gandhi's political economy.

Gandhi went on to write the 'Hind Swaraj', or the Indian Home Rule,in 1909, on a sea voyage from England to South Africa. This was a political diatribe against Western civilisation, but it also contained Gandhi's core economic ideas. The booklet was proscribed by the British government. Many of his ideas continued to evolve till his end came in 1948, but the core ideas were more or less unchanged. Some of the key propositions may be briefly stated. Gandhi's first thought was to focus attention on Indian villages, for it is there that the bulk of the Indian population lived. He wished to develop these as self-sufficient republics.

Secondly, Gandhi was of the view that the key issue confronting India was to provide gainful employment to each and every individual. The charkha was more than a symbol for him because it represented a concrete way of providing meaningful engagement to an otherwise unemployed individual. In a pure economistic calculation this might not be the most efficient way of producing cloth, but it was consistent with the notion of bread labour which enjoined that each human being must contribute some necessary amount of physical labour for his or her own upkeep. This idea was advocated by the Russian peasant philosopher Bondarev and later quite activelyespoused by Tolstoy and Gandhi.

Third, Gandhi said that 'machinery is a grand yet awful invention'. But it should be understood that he was not against machinery as such. He was critical of machinery to the extent that it displaced labour.This is far from a trivial issue for economists. Indeed, this was the old, fundamental, question of choice of techniques with which David Ricardo had originally grappled, and which generated considerable interest amongst the best of the mainstream economists of the 1950s and '60s, that included, notably, Joan Robinson, Amartya Sen , Robert Solow, Paul Samuelson and a galaxy of the best minds in the subject.

Fourth, Gandhi was all for limitation of wants. This was the exact obverse of the central idea of mainstream economics which is wedded to the idea of the expansion of the goods space to satisfy unlimited wants.Modern capitalism is substantially about mass consumption of goods and services. It is not uncommon to find more than a hundred varieties of breakfast cereals in an American or West European grocery store. In the Gandhian approach, just a few would do. In a somewhat similar vein, Thorstein Veblen talked of 'conspicuous consumption' - a social waste - in his 'Theory of the Leisure Class'. But, at the time he wrote the book, 1924, Veblen was dismissed as a crank by the American academic establishment. It is possible to hold the view that it is this Gandhian notion of 'limitation of wants', linked fundamentally to the notion of austerity, which may ultimately be consistent with ecological sustainability in the centuries to come.

Fifth, economics for Gandhi was a normative subject that was necessarily linked to ethics and one's notion of morality. Despite the neat dichotomy between the positive and normative that was demarcated by Lord Robbins, it is fair to say that ethical or normative considerations have come to the fore in the last half century in the theoretical writings of Anthony Atkinson, Amartya Sen, and many others. The Atkinson measure of inequality is a numerical number that assumes different values depending on a society's ethical or normative metric. It is possible to hold the view that the Gandhian idea of looking at economics as necessarily a moral or ethical subject, thought of quite intuitively, and without the engagement with classical and neo classical economic theory, was not totally off the mark after all.

After Gandhi returned from South Africa to India for good in 1915, at age 45, he was advised by his political mentor Gopal Krishna Gokhale to travel the length and breadth of the country to get to know the problems of the people and the country first hand. Gandhi did in fact proceed to do so. There is hardly anyone in the country's firmament in the last hundred years who knew the farm lands and the factories, the peasants and factory workers, of the country as intimately as M K Gandhi.

Gandhi's economic theorising emerged from his own understanding of the Indian objective conditions. To that extent his formulations were entirely sui generis. They had nothing to do with the writings of Smith, Ricardo, Malthus and Mill who theorised from the conditions prevalent in the England of those times when the Industrial Revolution had just set in. It is certainly possible to hold the view that, if for this reason alone, the Gandhian mode of analysis called and still calls for compelling attention, even though one might not go along fully with it.

The key, and the most major, dissenter of the Gandhian formations was none other than Jawaharlal Nehru, Gandhiji's chosen political heir. Nehru however never openly confronted Gandhiji on this because he accepted him as his supreme mentor. Nehru was a modernist who had been attracted to Fabian socialism while 'hovering about' London during 1910-12, studying to be a lawyer. Nehru was all for giving emphasis to industrialisation. He had been much taken up with the idea of planning ever since he saw, first hand in his case, the consolidation that the Soviets had been able to bring about after the hysteresis of the October Revolution of 1917. Nehru had visited Russia in 1927, on the tenth anniversary celebrations, at the invitation of the Soviets. The Soviets initiated their five year plans in 1928, and by the early 1930s, the results were quite striking. When, as Congress President, Subhash Chandra Bose constituted the National Planning Committee in 1938, the obvious person to head the NPC was Jawaharlal Nehru.

The Second World War, as well as the political activities, and prison incarcerations, of some of the important members, including the Chair, delayed the proceedings of the NPC, but it did nevertheless came out with a number of detailed prescriptions in the areas of industry, agriculture, poverty eradication, nutrition, health and education, etc. The assassination of Gandhi in less than six months of the country's Independence made Nehru the supreme leader to steer the economic policy of the country. True to his conviction, the Planning Commission was constituted on 15th March 1950 with Nehru, as the Prime Minister, being the Chairman. During the Second Plan, Nehru backed the Feldman-Mahalanobis strategy of giving primacy to the capital goods sector. But there is evidence that during the last years of his life, Nehru became more appreciative of Gandhiji's emphasis on agriculture and village industries. One only needs to see the first page of the Approach to the Third Five Year Plan, written in 1961, which had Nehru's imprimatur, and was possibly the last major intellectual

activity of Nehru in the economic sphere, before he was embroiled in the Chinese debacle and his own physical ailments. For the record, the Approach document squarely put the emphasis back on the agricultural sector in 1961.

Gandhiji had several notable adherents too, not least being J C Kumarappa who had earned his Master's in Economics in 1928 from Columbia, and was a student of Edwin Seligman, the well-known public finance theorist. The coinage of the term 'Gandhian Economics' is attributed to Kumarappa . There were other adherents too, but some of them haddifferences with Gandhi as well, and that was very much part of the intellectual climate of those heady freedom struggle years. This would be a long list, but some of the notable names would be Jayaprakash Narayan, Achyut Patwardhan, Ram Manohar Lohia, Acharya Narendra Dev, Yousuf Meherali and M L Dantwala. In more recent years there have been several important studies in the field of Gandhian economic analysis (see, for example, Ganguli (1973), Ajit K Dasgupta (1996)).

Two further aspects of Gandhi's thoughts deserve special mention. Gandhi had advocated the notion of 'trusteeship' for the capitalist class who would be expected to utilise their plant and machinery, and their wealth generally, not for their own personal use, but towards the public purpose and the common good of the masses. It was this notion which Gandhi offered as his version of socialism. He thought that this would bring about the Ramrajya of his dreams, which would ensure 'the rights alike of the prince and pauper'. The idea was roundly critiqued by Nehru, Jayaprakash Narayan and many others, including, Gunnar Myrdal. Narayan's response was particularly trenchant: 'A Ramarajya of paupers and princes! Why not? How else will the noble soul get an opportunity to practice deeds of high minded philanthropy…?' (see Zachariah, 2006, p. 167).

In the immediate aftermath of the financial crisis of 2008, even as Lehman Brothers had collapsed, there were a number of top corporate honchos of the Wall Street who had given themselves rather ample bonuses. This had come for some amount of public furore as well as some critical statements from the then US President Barrack Obama. Clearly capitalism needs to operate under several kinds of regulatory checks, but the idea of trusteeship points to the need for certain moral boundaries within which the system must operate. A closer examination of Gandhi's trusteeship idea would reveal that it is perhaps not as outlandish as one might think at first.

The second has to do with the idea of focusing on the poorest and weakest member of society, the 'daridra narayan', which is contained in Gandhi's 'talisman'. This is among the last notes Gandhi left behind in January 1948, but this was always intrinsic to Gandhi's moral view of the world from his earliest reading of religious scriptures. This idea of Gandhi was articulated well before John Rawls's early writings on distributive justice which appeared in

the 1950s. However, this by no means should alter the importance of Rawls's seminal contributions which were to culminate in his path-breaking work 'A Theory of Justice' (1971). This was to profoundly alter the course of theoretical welfare economics for all time to come.

III. Lal Bahadur Shastri was kind, unostentatious, and a deeply austere person. A K Dasgupta's Shastri Memorial Lectures (1975) were very appropriately focused on the economics of austerity. Consistent with his deep knowledge of the writings of Ricardo, Mill and Marx, Dasgupta dwells authoritatively on how these epochal minds visualised the final destiny of humankind. In the first of the two closely argued lectures Dasgupta identifies two phases in the structure of capitalism. As noted by Marx, in the first phase, the function of the capitalist is to accumulate and 'it is in terms of the stimulus to accumulation which it offers that Marx recognizes the historical role assumed by the capitalist system in the development of western economies. The capitalist is "personified capital" and accumulation is a passion with him' (Dasgupta, 2009, Vol III, p. 449).

However in the second stage the capitalist begins to indulge in luxury consumption. This necessarily has to happen because consumption of necessities is biologically limited, and new avenues of expenditure have to be created to keep the wheels of capitalism running. Thus the discovery of luxury goods is an inevitable concomitant of technical progress. The same urge that stimulates accumulation also stimulates the higher levels of consumption. In Marx's formulation, in the first phase, the desire to get rich – avarice – is a ruling passion, whereas in the latter phase, luxury is part of the cost of keeping up appearances. In the first phase, ownership of wealth in the form of capital is a source of power over the labour of the working class. In the latter phase, the display of luxury consumption by the capitalist is a source of power too, for it is this which distinguishes him from the workers (Dasgupta, 2009, Vol III, p. 449).

As Dasgupta very rightly observes, the foundations of classical political economy, as contained in the writings of Adam Smith and David Ricardo, were formulated in an atmosphere of growth. The average levels of living of even English people in the last part of the eighteenth century were abysmally poor. The founders of the modern study of political economy were first and foremost concerned with how the living conditions could be rapidly improved for one and all. The notions of division of labour or the case for free trade were merely instrumental to ensuring higher living standards for the common masses.

However one must be conscious of the caveats. In Adam Smith's Society of Perfect Liberty there would, no doubt, be a general increase in the well-being of everyone, but Smith also anticipated that after a time it would accumulate 'the full complement of riches' to which it was entitled by virtue of its resources and geographic placement. At this point accumulation

would stop, and growth with it (see Heilbroner, 1993, pp. 122-24).A growing population would divide up the output that would have ceased to grow. Smith's analysis foredooms the working class to the barest subsistence. Perhaps this is also the moral deterioration that Smith also expects from the division of labour. In Smith's own words, "all the nobler parts of the human character may be in great measure obliterated and extinguished in the great body of the people". Contrary to common perception, Smith was possibly the least optimistic about the long run fate of the human condition.

Dasgupta's formulations are centred more on the writings of David Ricardo and John Stuart Mill. At the outset one must remember that Ricardo, possibly the strongest pillar of the 'dismal science', was actually not an advocate of unlimited growth, and favoured some moderation, provided the population was restricted. In a famous letter to one Miss Mary Ann, David Ricardo wrote in 1822: 'Too much wealth would I fear spoil you, too little would make you suffer privation. I like neither extreme'. The greatest of economists always optimised instinctively.

A quarter century after David Ricardo's death in 1823, the darker side of the industrial revolution, with the growth of factory workers living in wretched conditions, was becoming more apparent to a wide array of thinkers and political economists as diverse as John Stuart Mill and Karl Marx.In his 'Principles', published in 1848, Mill saw no point in going continuously for economic growth, and dared to explicitly welcome a stationary state. Mill could also see the devastation that industrialisation was causing to mother nature and he went on to welcome a stationary state, provided that the growth of population was stopped at a point at which, thanks to technical innovations, people in general were assured of a comfortable existence. The other document which was to alter the course of human history was Marx and Lenin's 'Communist Manifesto', also published in 1848.

Rather than seeing the stationary state as the finale for capitalism and economic progress, Mill saw it as the first stage of a benign world where mankind would turn its attention to the serious and meaningful matters of liberty and justice, so that all individuals are able to realise their full potential. Mill looks upon the stationary state as a blissful equilibrium in which the competitive struggle has disappeared, and in which wealth is more evenly divided as a result both of individual prudence as well as social legislation. But, in his view, all this is predicated on restricting population here and now.

It should be a no brainer to realise that Mill's stationary state is more likely to be consistent with a sustainable ecology as compared to anything the growth fetishists may have to offer. This is also possibly where, coming from different directions, Gandhi and Mill intellectually meet. While on the theme of economic policy and social engineering it is possible to hold the view, following Dasgupta, that we must eschew both the production and consumption of

luxury goods as well as those developmental options that sharpen the inequalities of income and wealth.

Interestingly, in each of the three pieces by Dasgupta on Gandhi that we have referred to above there is a sense of pessimism that Indian policy makers and the people at large are unlikely to embrace the Gandhian mode of thinking. This is contained both in the 1969a and 1969b pieces, but even in the 1987 piece, a similar sense of despondency is noticeable. From whatever one knows about the thinking process of the dominant Indian citizenry – in the media, in academics and elsewhere – we do not seem to be any closer today to welcoming Gandhian precepts, and if anything, we seem to have moved further away in the last three decades, especially after going in for neo liberal reforms starting in 1991.

In the both the pieces of Dasgupta's dated Gandhi's birth centenary year, 1969, there is articulation of an interesting thought that could come only from a person who has assimilated classical and neo classical economic thought in its deepest essence. I shall quote it in extenso:

'Marxian revolution, let us recall, was originally meant for the industrialised West, but was actually adopted, against Marx's own prediction, by the underdeveloped East. Can it not be that this reversal of venue will be repeated in the case of Gandhian revolution too? It may well happen that it will catch the affluent West sooner than one would imagine. May be that the suitable soil for a peaceful revolution such as Gandhi envisaged is an affluent society and not an immature one. It makes smooth going to settle on a plateau once you have climbed the hill; the journey uphill is arduous' (Dasgupta, 2009, Vol III, p. 82).

We know that A K Dasgupta's final idea of putting together a book on Gandhi's economic ideas unfortunately remained an unfulfilled wish. But we also know that a person so keenly versed in the classical, marginalist and Keynesian modes of thought ultimately had turned his attention on Gandhi and the economics of austerity. There must have been some deeply felt rationale for this in the mind of the great theorist.

Seventy years after India's Independence it would not be incorrect to say that we are far from providing the basic modicum of decent living for the bottom rungs of this vast subcontinent. Poverty, unemployment and growing inequality continue to be a major scourge of the economy we live in. The questions Gandhi had raised still continue to be astonishingly relevant. We end this lecture with the fond hope that some among the present generation of economic theorists may care to turn their attention to examine at least a few of the issues that were of deep concern to Gandhi and see if there could be some real possibility of improving the human condition among the poorest of the poor. The urgency of this task can hardly be overemphasised.

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Artha Beekshan, Volume 26, No 3, December 2017

MONEY AND INFLATION: AN ECONOMETRIC INVESTIGATION OF INDIA FROM 1970-71 TO 2012-13

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Abstract

In an attempt to explain the causes of inflation in developing countries like India, people come across two major competing hypotheses. Firstly, there is the monetarist model which sees inflation as essentially a monetary phenomenon, termed as demand pull inflation. Secondly, the structuralist model, by contrast, argues that the causes of inflation must be sought in certain structural characteristics, especially the presence of bottlenecks in developing countries that make them particularly prone to inflation, known as cost push inflation. This paper concentrates on the long run effect of money growth on inflation. It examines the proposition- inflation is a monetary phenomenon, implying that inflation is primarily, if not entirely, due to money growth. Hence this paper tries to illustrate and empirically test only the monetarist proposition that is to what extend change in price is influenced by change in money supply. The results of the econometric estimation are quite interesting to note and give us conclusions which can help the central bank to control inflation effectively in the future.

KEY WORDS: **Money supply, Inflation, Wages, Price**

JEL CLASSIFICATIONS: E51, E31, J31

I. Introduction

Monetary economics is primarily concerned with the effects of individual decisions, monetary institutions, and policy actions to determine the demand for and supply of money and its subsequent impact on the aggregate economy (Meltzer, 1998). A large share of the importance of monetary economics stems from the crucial intermediary role that money plays in most transaction taking place in today's less developed economies. Majority of analyst believes that monetary policies have an overwhelmingly important bearing on the economic wellbeing of a nation (Prasad, 2010). Monetary economics often reduces complicated details of the economy to very manageable essentials. The interaction between money and inflation is one of them

Monetarists, basically argue that if money supply rises faster than the rate of growth of national income then there will be inflation. To explain this let's consider the Fisher's Quantity theory of Money equation

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MV=PT,

where M = Money Supply, V= Velocity of circulation, P= Price Level and T = Transactions.

T is often difficult to measure so it is substituted by Y = National output, therefore

MV = PY.

Monetarists believe that in the short term velocity (V) is fixed because the rate at which money circulates is determined by institutional factors· Output Y is also considered to be fixed as they state it may vary in the short run but not in the long Run (because LRAS-Long Run Aggregate Supply is inelastic). Therefore an increase in money supply will lead to an increase in the price level and sustained rise in price level will lead to inflation (Meltzer,1998). In retrospection, this paper tries to link money and inflation. It tries to show the extent to which a change in price level is affected by changes in money supply and vice-versa under the assumption that real output grows overtime. A conscious effort is made to model the process as appropriately as possible.

The entire paper is organized in the following manner: Section II gives a theoretical justification of the model followed by an empirical evidence of this justification. In Section III major findings are listed and the next section provides a brief discussion on the findings. Section V concludes.

II. Theoretical and Empirical Background

This paper proposes to establish a basic result –Inflation is indeed a monetary phenomenon. In order to do so a theoretical justification of the dynamics of inflation that attempts to explain the claim that inflation is always a monetary phenomenon in India is important. If the above proposition is to be vindicated then it is expected to find a tight link between inflation and growth in money.

The money market, like all other markets, has both a demand side and a supply side. Since people can put their liquid assets either into money or bond, we might expect that an increase in the rate of interest, or the rate of return on bonds, would tempt them to put more of their liquid assets into bonds and less into money and vice versa (Branson, 2005). This inclination of holding more or less money depending on the rate of interest(r) is known as the speculative demand for money say l(r) and l' <0. There is another reason to hold money, creating another kind of demand for money named as precautionary demand for money. People hold money in order to bridge the time gap between their receipt of income and payments they have to make i.e. to smooth out the monthly paychecks and daily payments(Branson, 2005). As income(Y) rise, both income and expenditure stream grows and this is called the transaction demand for money which rises as level of income rises. The above types of demands constitute

the demand for real balances (M/P). Hence the demand function can be written as:

$M/P = f(r,Y)$……..……(1.1)

where $f'_r < 0$, $f'_y > 0$.

On the supply side of the money market, the amount of currency and demand deposit in the economy are assumed to be fixed by institutional arrangements between the commercial banking system and the central bank (RBI). Thus the money supply is fixed exogenously say at M.

Equating the money demand function to the exogenously fixed supply of money gives the equilibrium condition in the money market:

$M/P = f(r,y)$……...(1.2)

Since the motive is to check the extent by which change in money supply affects change in price, let's assume a log – linear equation for money supply:

$\ln M_t = b_0 + b_1 \ln P(t) - b_3 \ln r + b_4 \ln Y(t) + u_2(t)$……(1.3)

The next equation of the model is the price equation. Price level(here it is the price of manufactured commodities, denoted by P) of a country depends on money supply(M), income(Y) and wage rate(w) prevailing in the industrial sector for our model. As money supply(M) rises, people get more money in their hand so their purchasing power rises. Hence demand for goods rises leading to rise in price level.On the other hand if people get more income(Y) then also they demand more goods giving rise to demand pull inflation i.e. price rises too. To explain the relationship between P and w, it can be said that wage effects price positively (P. Richard G. Layard, 2005). If wage rises due to trade union pressure employers have to rise the price of commodities to keep the level of profit same. This mainly occurs in the organised sector where there exists trade union to bargain for price hike. So the price – function can be written as:

$P = ¢(M,Y,w)$……...……...(1.4)

and $¢_M' > 0$,$¢'_Y > 0$ and $¢'_w > 0$.

The log linear price equation is:

$\ln P(t) = a_0 + a_1 \ln M(t) + a_2 \ln Y(t) + a_3 \ln w(t) + u_1(t)$…….(1.5)

Empirical justification of the assumed model

Data sources:

Time series data of NNP_{fc}(National Income) at constant prices (base year 2004-05) , money supply (M3), wage rate, rate of interest(lending rates) and WPI (are taken from RBI (different volumes of Database on Indian Economy). Note that, in most countries, the main focus is placed on the CPI(Consumer Price Index) for assessing inflationary trends, both because it is usually the index where most statistical resources are placed and because it most closely represents the cost of living (and is therefore most appropriate in terms of the welfare of the individuals in the economy). In India, however, the main focus was placed on the WPI (Wholesale Price Index) till 2014 because it has a broader coverage and is published on a more frequent and timely basis. In this model too WPI is considered as the data points are till 2013.

Graphical representations:

Data from Indian economy shows that money supply and price level are positively related (Fiqure:1) which is at par with the above equation. Initially from 1970-71 till 1974-75, money supply and price level were at par but since then money supply rises at a higher rate than price (similar to statistical result of this paper) which may be due to various policy measures undertaken to at the international and national level to survive the oil shocks.

Money supply and national income are also positively related(Fiqure:2) as evident for India since 1970-71. This grarhical presentation suffices to the proposition of this paper. National income or output rises at a slower rate than money supply since 2006-07 indicates an obvious rise in price level. So indirectly this too suffices the proposition of the paper.

Price and national income are positively related(Fiqure:3) as evident for India since 1970-7 which is quite obvious. Price and wage are also positively related(Fiqure:4) as evident for India since 1970-71. Hence the price function as stated above suffices for Indian economy as well.

Figure 1

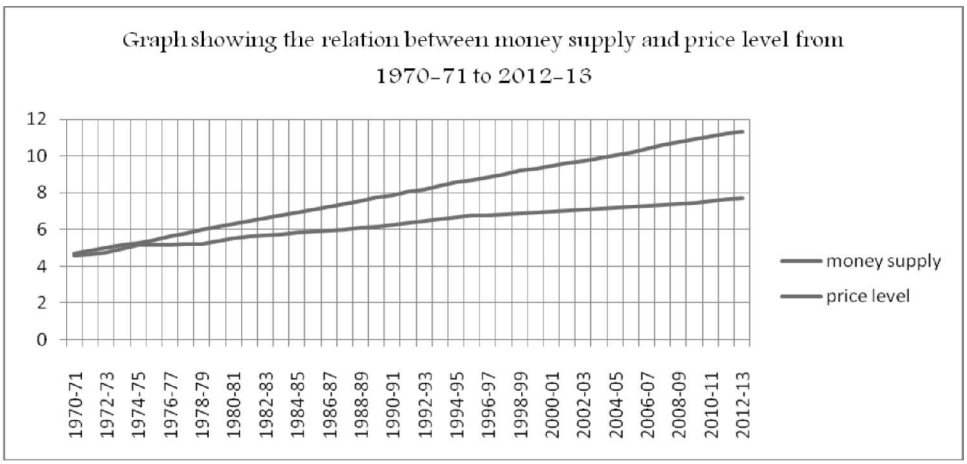


Figure 2

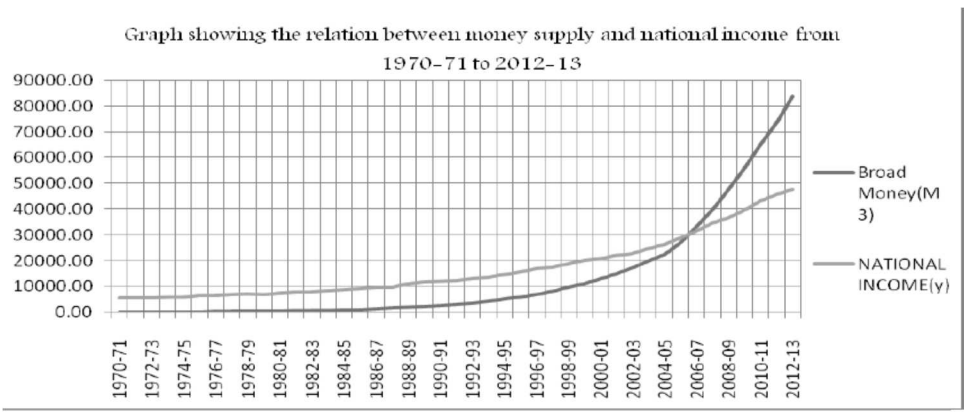
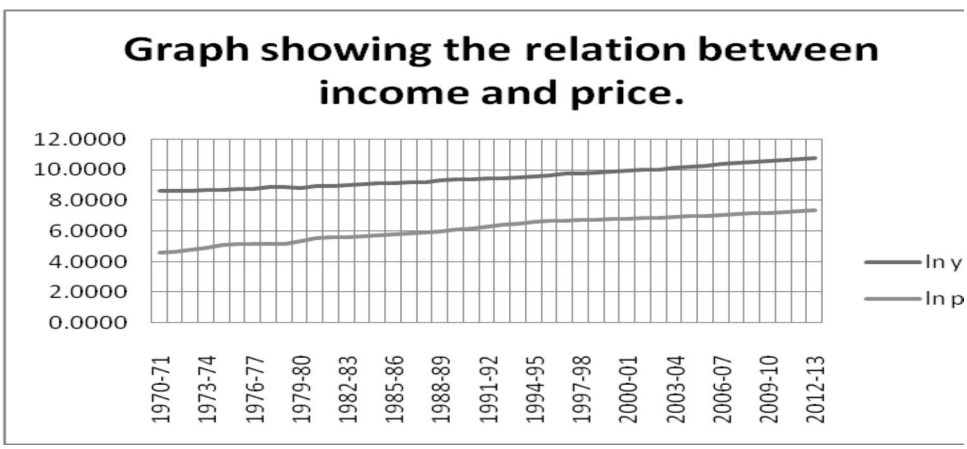


Figure 3



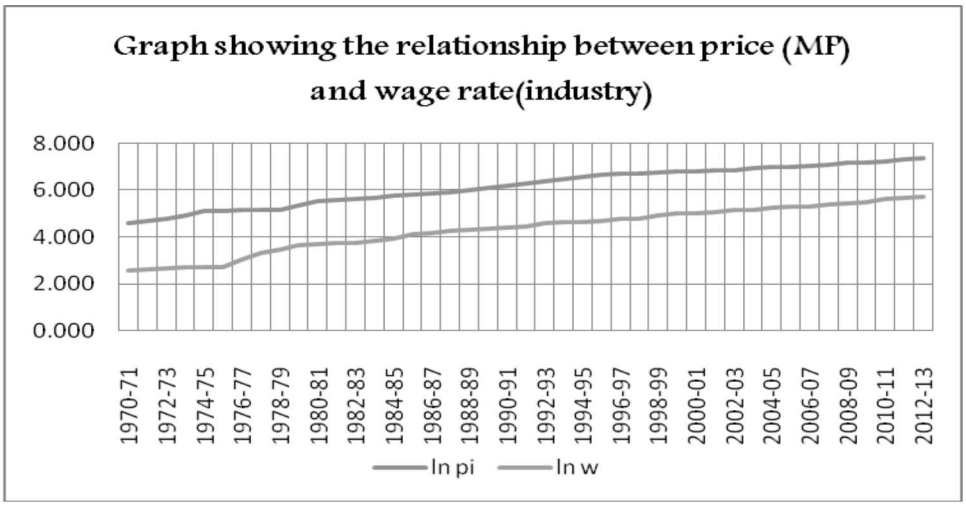


Figure 4

Source: Author's estimation based on secondary data

III. Findings

To examine the proposition that inflation is a monetary phenomenon a system of equation is needed. The system is comprised of a money supply equation and a price equation.

The **structural equations** of the model are as follows:

Price equation: $\ln P(t) = a_0 + a_1 \ln M(t) + a_2 \ln Y(t) + a_3 \ln w(t) + u_1(t)$ ————————-——(3.1)

Money supply equation: $\ln M(t) = b_0 + b_1 \ln P(t) - b_3 \ln r + b_4 \ln Y(t) + u_2(t)$ ————————-——(3.2)

There are two endogenous variables in our model, viz. Money supply (M) and price (P). The exogenous variables are national income (Y), wage rate (w) and rate of interest(r).

Though money supply and price may depend on various other variables but here only some of the quantifiable variables are taken. Note that both the equations have unique statistical form so they are not confused with Mongrel equation and hence can be identified.

There are several methods for estimating systems of simultaneous equations. The two- stage least squares estimator (2SLS), one of the most popular, is efficient and consistent but it ignores information associated with endogenous variables that appear in the system but not in individual equations. Information concerning the error covariance is also lost. A refinement is required to do away with the correlations. It can be done via the use of instrumental

variables for the relevant regressors. But here 3SLS has been used to estimate the model since it has lower Root Mean Square Error and is thus asymptotically more efficient than 2SLS. The results are listed in Table 1.

Table 1:The regression results

Regressand	ln M(t)			ln P(t)		
R^2	0.9985			0.9971		
Regressors	ln P(t)	ln Y(t)	ln r w(t)	ln M(t)	ln Y(t)	ln
	1.025	1.738	0.185	0.574	1.023	0.369
	(11.52)	(5.78)	(2.33)	(6.99)	(9.39)	(3.35)

*z values are given in the parenthesis. *significant at 5% level, ** significant at 1% level*

R^2 is quiet high and the F-ratio is highly significant hence it can be concluded that the model is a very good fit.

As the model is log linear, so the coefficients explain the elasticity. As per the result, a 100% rise in money supply will cause nearly 57% rise in price i.e one unit change in money supply changes price level by 0.57 units (inelastic). On the other hand a unit rise in wage rate will increase price by .37 units

It can be further said that income (NNP) is also positively related to price. This is quite obvious because as income rises, people get more purchasing power and hence demand more commodities and if supply cannot keep pace with demand, price rises. It can be stated that, rate of interest, income and price all are positively related with money supply and income and wage rate are also positively related with price. These results complement economic theory.

Finally, money supply and price (the two endogenous variables of our model) share a positive and highly significant relation. Hence the proposition of this paper is justified i.e. inflation (continuous rise in price level) is indeed a monetary phenomenon.

There are two more interesting results as well:-

i)When income changes by 1 unit both money supply and price changes by more than one unit (elastic).

ii) When price changes by 1 unit money supply changes by more than one unit (elastic but when money supply changes by 1 unit price changes by less than one unit (inelastic)

IV. Discussion

In order to control inflation, two counter – inflationary packages have been recommended in the literature: the orthodox measures (which concentrate on fiscal and monetary contraction in terms of budget deficit and money growth) and the heterodox measures (which add to the orthodox measures an income policy including wage freezes and a fixed exchange rate)(Krisna,1997). While income policies can do much in the high inflation countries in fiscal – adjustment programs, the heterodox approach is not recommended for stopping inflation in countries that have traditionally experienced moderate and low inflation. These countries should rely as much as on orthodox measures.

Maintaining a reasonable degree of price stability while ensuring an adequate expansion of credit to assist economic growth have been the primary goals of monetary policy in India. Prime Minister Vajpayee had once stated that "inflation is the single biggest enemy of the poor" (Callen & Chang, 1999). Consequently maintaining a low inflation is a necessary part of an effective anti poverty strategy. Inflation is considered to be a major economic problem by the monetary authorities. Inflation needs to be kept under check for sustained growth and to prevent deterioration in the already low living stand-ards of India's poor. The negative consequences of inflation are well known. Inflation can result in a decrease in the purchasing power of the national currency leading to the aggravation of social conditions and living standards. High prices can also lead to uncertainty making domestic and foreign investors reluctant to invest in the economy. Moreover, inflated prices worsen the country's terms of trade by making domestic goods expensive on regional and world markets. To develop an effective monetary policy, central banks should possess information on the economic situation in the country, the behaviour and inter-relationships of major macroeconomic indicators. Such information would enable the central bank to predict future macroeconomic developments and to react in a proper way to shocks the economy is subject to. Thus, studying inflationary processes is an important issue for monetary economists all around the world. However, it is not an easy task, especially in developing countries, where economic processes are highly unstable and volatile.

V. Conclusion

An inductive approach has been followed in this paper. Two endogenous variables and three exogenous variables are used to validate the proposition that inflation is a monetary phenomenon using a simultaneous equation model with Indian economy data from 1970-71 to 2012-13. As expected, interpreting the results it has been found that the model almost satisfies the economic theory behind the model. The two endogenous variables are positively related, i.e. if money supply rises price also rises and it is justified as well.

In Indian context, quantitative easing by the central bank with the effect of an increased

money supply often helps to increase or moderate inflationary targets. Lastly besides money supply, the wage rate hike and income have known to play a dominant role in the regard of monetary policy as shown above. So while implementing monetary policies, planners must look into this matter.

For India, adopting inflation targeting is not an easy task; there are many hurdles in practicing it. The prerequisites of inflation targeting such as highly independent central bank, a high degree of transparency in terms of monetary policy strategy and implementation and explicit quantitative targets for inflation. In view of these requisites inflation targeting has not been adopted formally in India so far.

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Artha Beekshan, Volume 26, No 3, December 2017

DECOMPOSITION OF OUTPUT AND PRODUCTIVITY GROWTH: A PANEL STUDY OF 2-DIGIT MANUFACTURING INDUSTRIES IN WEST BENGAL

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ABSTRACT

The paper examines and applies the theoretical foundation of the decomposition of output and productivity growth of thirteen 2-digit manufacturing industries as well as total manufacturing industry in West Bengal during the period from 1981-82 to 2010-11. A stochastic frontier model with a translog production function is used to decompose output and total factor productivity growth (TFPG) of thirteen 2-digit manufacturing industries as well as total manufacturing industry in West Bengal during the study period (1981-82 to 2010-11), pre-& post-reform period (1981-82 to 1990-91 and 1991-92 to 2010-11) and during two decades of the post-reform period (1991-92 to 2000-01 and 2001-02 to 2110-11).The attributes of output growth are input growth and TFPG and again TFPG consists of three components like adjusted scale effect(ASC), technological progress(TP) and technical efficiency effect(TE). The empirical results show that input growth is the major contributor to output growth in West Bengal manufacturing, and total factor productivity growth (TFPG) has relatively small effect, though positive and significant, on output growth in almost all the 2-digit industries in West Bengal. Of the components of TFPG the technological progress is found to be the major contributor to TFPG and the scale effect has also become significant during the recent years. The impact of technical inefficiency is found to be time invariant in nature and it is also statistically insignificant during the whole period of our study. The relevant policy implication for the development of the organized manufacturing industries in West Bengal is the need to improve TFPG components of the organized manufacturing industries in West Bengal during the forth-coming years.

Key Words: Organized Manufacturing Industries in West Bengal, Stochastic Frontier Production Function, Total Factor Productivity Growth, Adjusted Scale Effect, Technological Progress and Technical Efficiency Effect .

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JEL Classification Codes : C14,C23,L 60, O14 .

I. Introduction

Output growth overtime is usually attributed to growth in factor inputs and improvement in total factor productivity (TFP). While measuring the sources of output growth, the contribution of TFP is always estimated as a residual, after accounting for the growth in factor inputs. If the industries operate on their production possibility frontiers producing the maximum possible output or realizing the full potential of the technology, then this implies that improvement in productivity arises from technological progress. Operation on the production frontier can be achieved if industries follow the best practice methods of application of technology commonly referred to as technical efficiency. So productivity improvements can be achieved in two ways: Improving the state of technology by innovation, and implementing the programs such as improving workers' education, and ensuring that workers use the existing technology more efficiently. While the first approach is referred to as technological progress, the second one as technical efficiency. The classical growth models assume that there exists technical efficiency in the production process and production always occurs on the production frontier. But the existence of technical inefficiency cannot be ruled out altogether. The stochastic frontier model (Aigner et al., 1977; Battese and Coelli, 1988 and 1992; Greene, 2005) can be used to check whether there exists technical inefficiency in the production process. Further, using this model output growth can be decomposed into input growth effect and total factor productivity growth (TFPG) and further TFPG into technological progress (TP), technical efficiency changes (TEC) and adjusted scale effect (ASC).

In our study we decomposed output growth and TFPG of thirteen 2-digit manufacturing industries in West Bengal by using stochastic frontier model assuming that these industries are not able to fully utilize the existing resources and technology which is very likely to happen because of the effects of various non-price and organizational factors that might have led to technical inefficiencies in production. The manufacturing industries in West Bengal considered in our study are: (1) manufacture of food products (20-21), (2) manufacture of beverages and tobacco products (22), (3) manufacture of textile and textile products (23+24+25+26), (4) manufacture of wood and wood products; furniture and fixtures (27), (5) manufacture of paper and paper products (28), (6) manufacture of leather and leather products (29), (7) manufacture of chemicals and chemical products (30), (8) manufacture of rubber, petroleum and coal products (31), (9) manufacture of non-metallic mineral products (32), (10) manufacture of basic metals and alloys (33), (11) manufacture of metal products (34),(12) manufacture of machinery and transport equipments (35+36+37), (13) other manufacturing industries (38) as well as total manufacturing industry of the state. Using panel data of the above mentioned industries in West Bengal over a period from 1981-82 to

2010-11, and during pre-reform period (1981-82 to 1990-91), post-reform-period (1991-92 to 2010-11) and also during two decades of the post-reform period, i.e., during 1991-91 to 2000-01 and during 2001-02 to 2010-11], we decomposed output growth of the organized manufacturing industries in West Bengal into input growth and TFP growth (TFPG). TFPG has again been decomposed into scale effect, technological progress and technical inefficiency effects in order to examine the trend and variations in the TFPG and its different components. To the best of our knowledge, none of the existing studies has decomposed output and TFP growth of the organized manufacturing industries in West Bengal at the disaggregated level as we propose to do.

The rest of the paper is organized as follows. The next section outlines the stochastic frontier production function and the methodology that involve decomposition of output and TFP growth. The econometric specifications of the stochastic frontier production function and the time-varying technical inefficiency function have also been done in this section. Data sources and the measurement of variables are presented in Section 3. Section 4 presents the results of tests of hypotheses and other empirical results and their analyses. The final section contains concluding remarks.

II. Decomposing output and Productivity growth

Although neo-classical growth models assume technical efficiency and they also assume that production always occurs on the production frontier. But if there exits technical inefficiency in the production process this can be estimated by using a stochastic frontier model (Aigner et al., 1977; Battese and Coelli, 1988 and 1992; Greene, 2005) given by

$$Y_t = F\,(X_{1t}, X_{2t}, \ldots, Xnt, t)\, e^{-u_t}, \qquad (1)$$

where Y is the actual level of output; F is the potential production function with 'n' inputs; Xit is i^{th} input; and 'u' is a half-normally distributed random variable with a positive mean. The inclusion of 't' in 'F' allows for the production function to shift over time due to technological progress. The last term e^{-} measures technical inefficiency.

Taking logarithm on both sides of (1) yields

$$\log Y_t = \log F\,(X_{1t}, X_{2t}, \ldots, Xnt, t) - u_t \qquad (2)$$

Technical inefficiency occurs when $u_t > 0$ and the level of $\log Y_t$ is less than the level of log F. Differentiating Equation (2) with respect to time yields the following output growth equation:

$$\dot{Y}_t = \sum_i \frac{\partial F}{\partial X_{it}} \frac{X_{it}}{F} \dot{X}_{it} + \frac{\partial u_t}{\partial t} \qquad (3)$$

where $\dot{Y}_t = \frac{\partial Y_t / \partial t}{Y_t}$ is the growth of output and $\dot{X}_{it} = \frac{\partial X_{it} / \partial t}{X_{it}}$ is the growth of input X_{it}.

Therefore, $e_{it} = \frac{\partial F}{\partial X_{it}} \frac{X_{it}}{F}$, where e_{it} represents output elasticity for input X_{it}. Let $e_t = \sum_i e_{it}$ (the sum of the elasticities of each individual input). It can be shown that e_t is a measure of returns to scale. The production shows increasing, constant, decreasing returns to scale depending on whether $e_t > 1$, $= 1$, or < 1. Kumbhakar and Lovell (2000) include the allocative inefficiency component in their decomposition. However, the allocative inefficiency component does not exist in this study as the cost minimization programme is used.

The technical efficiency (TE) is defined as the ratio of the actual output to the potential output, $TE_t = \frac{Y}{F} = e^{-u_t}$. Then, the growth of the technical efficiency,

$$\dot{TE}_t = -\frac{\partial u_t}{\partial t} \tag{4}$$

The output growth can therefore be represented as

$$\dot{Y}_t = \sum_i e_{it} \dot{X}_{it} + \dot{A}_t + \dot{TE}_t \tag{5}$$

Consider the following cost minimization problem under perfect competition in the factors markets, but not necessarily in the product market.

$$\text{Min}_{Xit}\ C_t = \sum_i w_{it} X_{it} \quad \text{subject to } Y_t = F(X_{1t}, X_{2t}, \ldots, Xnt, t)\, e^{-} \tag{6}$$

We express the objective function and the constraint in the Lagrangian form,

$$L(X_{it}, \lambda) = +\lambda\,(Y_t F\, e^{-}), \tag{7}$$

where λ is the Lagrange multiplier. The first-order condition for minimization requires,

$$w_{it} = \lambda\, e^{-} = \lambda\, e^{-}\lambda e_{it} \tag{8}$$

Multiplying both sides by X_{it},

$$w_{it} X_{it} = \lambda e_{it} Y_t \tag{9}$$

Taking the sum of all inputs i, the total cost function becomes

$$\sum_i w_{it} X_{it} = \lambda e_{it} Y_t \tag{10}$$

or,

$$Ct = \lambda e_t Y_t \quad (\text{ since } e_t =) \tag{11}$$

Denoting the cost share of input X_{it} as S_{it}, and dividing equation (9) by equation (11),we obtain the cost share as

$$S_{it} = \frac{w_{it} X_{it}}{C_t} = \frac{e_{it}}{e_t} \tag{12}$$

This shows that the cost share is always equal to the relative output elasticity in the case of cost minimization[1]. We can rewrite the output growth Equation (5)

$$\dot{Y}_t = \sum_i e_{it} \dot{X}_{it} + \dot{A}_t + T\dot{E}_t$$

as

$$\dot{Y}_t = e_t \sum_i \frac{e_{it}}{e_t} \dot{X}_{it} + \dot{A}_t + T\dot{E}_t \tag{13}$$

By adding and subtracting term we obtain,

$$\dot{Y}_t = \sum_i \frac{e_{it}}{e_t} \dot{X}_{it} + (e_t - 1) \sum_i \frac{e_{it}}{e_t} \dot{X}_{it} + \dot{A}_t + T\dot{E}_t$$

(14)

Using Equation (12) we obtain another variant of

$$\dot{Y}_t = \sum_i s_{it} \dot{X}_{it} + (e_t - 1) \sum_i s_{it} \dot{X}_{it} + \dot{A}_t + T\dot{E}_t \tag{15}$$

Equation (14) shows the decomposition without cost information (w) and can be used for the empirical estimation of the sources of output growth, if the parameters of the production function are known. Equation (15) shows that output growth can be decomposed into four components: weighted sum of input growth, adjusted scale effect, technological progress, and growth of technical efficiency. The first term in equation (14), which represents the weight for each input growth, is equal to the cost share of each input. The second term represents the adjusted scale effect. When the returns to scale are constant, this term is zero. For the production with increasing returns to scale, $e_t > 1$, a part of returns to scale (e_t-1) contributes to the output growth if aggregate input growth is positive. The contribution from returns to scale (e_t-1) is weighted by the aggregate input growth $\sum_i s_{it} \dot{X}_{it}$. If the aggregate input growth is zero, then the scale effect is zero.

The first two terms in equation (15) show that input growth has two impacts on output growth. One is the direct impact through its growth and the other is the indirect impact through scale effect. The decompositions in equations (14) and (15) have relaxed a major assumption in Solow's (1957) decomposition model of economic growth, as equation (15) does not require the constant returns to scale assumption.

Indeed, the growth decomposition as shown by equations (14) and (15) can be applied to any types of production function as long as output elasticity for each input can be derived. This implies that a nonlinear production function such as the translog production function can be used for growth decomposition analysis.

Total factor productivity (TFP) is defined as

$$\mathrm{TFP}_t = \frac{Y_t}{\Phi_t} \tag{16}$$

where Φ is the aggregate input . Taking logarithm and differentiating with respect to time, the TFP growth becomes

$$\dot{TFP}_t = \dot{Y}t - \dot{\Phi}_t \tag{17}$$

Although it is not feasible to measure 'Ö' since it is the aggregate of different inputs with different unit of measurements, a commonly used measure of input growth is the Divisia index (Jorgenson and Griliches, 1967),

$$\dot{\Phi}_t = \sum_i \frac{w_{it} X_{it}}{C_t} \dot{X}_{it} = \sum_i s_{it} \dot{X}_{it} \tag{18}$$

Substituting equations (15) and (18) into (17), the TFP growth becomes

$$\dot{TFP}_t = (e_t - 1) \sum_i s_{it} \dot{X}_{it} + \dot{A}_t + \dot{TE}_t \tag{19}$$

Thus TFP growth has three components: adjusted scale effect, technological progress, and growth of technical efficiency (Bauer, 1990; Kumbhakar and Lovell, 2000, pp. 284)[2].It may be noted that if there exists constant returns to scale in the production process, e_t=1, and if there is no technical inefficiency, the decomposition is reduced to as in Solow (1957).

II.1. Model Specification

The empirical analysis involves the panel data estimation of thirteen 2-digit industries in West Bengal as well as in total manufacturing industry of the state for the period from 1981-82 to 2010-11. The output for the production function is the real value-added (Y) of the aforementioned industries of the state and the inputs are labor (L) indicated by the total number of employees and capital (K).

The estimation model is the production function with a second-order transcendental logarithmic (translog) form,

$$LnY_{it}=â_0+â_L lnL_{it}+â_K lnK_{it}+â_t t+1/2â_{LL}L_{it}^2+1/2â_{KK}K_{it}^2+1/2â_{tt}t^2+â_{LK}lnL_{it}lnK_{it}+â_{Lt}L_{it}t+ â_{Kt}K_{it}t+v_{it}-u_{it} \tag{20}$$

where the subscript 'i' is the ith industry of the state and 't' is the time period. The random error v_{it} is symmetric and normally distributed with $v_{it} \sim N(0, \sigma_v^2)$ and u_{it} is a non-negative truncated normal random error with the probability distribution of $N(\mu, \sigma_u^2)$, where ì is the mode of the normal distribution. The non-negative property of the random error u_{it} is used to

measure technical inefficiency as in Equation (4). Technical inefficiency can either be time variant (u_{it}) or time invariant (u_i).

In case of time variant technical inefficiency, u_{it} can be expressed as a monotonic 'decay' function as (Battese and Coelli, 1992, 1997):

$$u_{it} = \eta_t u_i = u_i \exp(-\eta\,[t-T]),\ i=1,\ldots,N;\ t=1,\ldots,T \tag{21}$$

The technical inefficiency u_{it} will either increase (if $\eta<0$), or decrease (if $\eta>0$) or will remain constant (if $\eta=0$).

From Equation (20), the output elasticity of labor and capital for industry 'i' and time t, denoted by e_{Lit} and e_{Kit} respectively, are derived as follows:

$$e_{Lit}=\text{"}\ \ln F/\text{"}\ln L_{it} = \beta_L+\beta_{LL}\ln L_{it}+\beta_{LK}\ln K_{it}+\beta_{Lt}t \tag{22}$$

$$e_{Kit}=\text{"}\ \ln F/\text{"}\ln K_{it} = \beta_K+\beta_{KL}\ln L_{it}+\beta_{KK}\ln K_{it}+\beta_{Kt}t \tag{23}$$

The returns to scale is measured as $e_{it} = e_{Lit} + e_{Kit}$. The cost shares of inputs are $s_{Lit} = \frac{e_{L_{it}}}{e_{it}}$ and $s_{Kit} = \frac{e_{K_{it}}}{e_{it}}$. The maximum likelihood method is generally used to estimate the parameters in a stochastic frontier production function (Battese and Coelli, 1988 and 1992; Kumbhakar and Lovell, 2000; Kumbkakar, 1990). After estimating the parameters in equation (20), equations (22) and (23) are used for the calculation of output elasticities and the adjusted scale effect. Given the estimates of the parameters in equation (20) and (21), the technical efficiency level of the state 'i' at time't' (TE_{it}), defined as the ratio of the actual output to the potential output determined by the production frontier, can be written as

$$TE_{it} = \exp(-u_{it}) \tag{25}$$

and TEC is the change in TE, and the rate of technological progress (TP_{it}) is defined by

$$TP_{it}=\text{"}\ln F/\text{"}t=\beta t+\beta_{it}t+\beta_{Lt}\ln L_{it}+\beta_{kt}\ln K_{it} \tag{26}$$

where βt and β_{it} are 'Hicksian' parameters and β_{Lt} and β_{kt} are 'factor augmented' parameters. It is noted that when technological progress is non-neutral, the change in TP may be varied for different input vectors. To avoid such problems, Coeli et al (1998) suggest that the geometric mean between the adjacent periods be used to estimate the TP component.

III. Data and Variables

The study is based on panel data collected from the various issues of Annual Survey of Industries (ASI), Central Statistical Organization (CSO), Ministry of Statistics and Program Implementation, Government of India, New Delhi, for the period 1981-82 to 2010-11. The EPW database has also been utilized to obtain relevant data for the period 1981-82 to 2010-11. The variables used in this study are output and labour and capital inputs. Deflated value added has been taken as the measure of output. Deflation has been done by the GDP deflator prepared from the ratio of nominal and real GDP, the data for which have been obtained from different volumes of NAS. "Total persons engaged are used as a measure of labour input; which includes workers and persons other than workers which are equally important in getting the work done like supervisors, managers, technicians etc. Total emoluments divided by total number of persons engaged in production is considered as price of labour input in the study. Net fixed capital stock at constant prices has been taken as the measure of capital input. The net fixed capital stock series has been constructed from the series on gross fixed capital formation (at constant prices) using the perpetual inventory accumulation method. The annual rate of depreciation of fixed assets has been taken as 5 per cent. Rental price of capital equals the ratio of interest paid and capital invested (Jorgenson and Griliches, 1967) is assumed to be price of capital in this study.

4. Hypotheses Test and Preferred Model Chosen

In our study FRONTIER 4.1 software developed by Coelli (1992 & 1995) is used to perform tests of hypotheses as mentioned above which are required for model specification. It enables us to undertake a one-step estimation of the stochastic frontier model as well as the parameters of the variables included to explain efficiency. Here we are testing the parameters γ, μ and η. The γ parameter is the variance-ratio parameter, which will help us to determine whether a stochastic production frontier model is a better measure than the traditional average production function model. The μ parameter determines the distribution of the inefficiency, i.e., whether it a half-normal distribution or a truncated normal distribution. The parameter η determines whether the inefficiencies are time- variant or time- invariant. Various tests of hypotheses of the parameters in the frontier function can be performed using the generalized likelihood ratio test statistic, defined by

$$\lambda = -2\ [-!\ (H_0) - -!\ (H_1)]$$

where $-!\ (H_0)$ and $-!\ (H_1)$ are the values of the log-likelihood function under the null and alternative hypothesis respectively. If the null hypothesis is true, then λ has approximately a Chi-Square distribution (or a mixed chi-square) with degrees of freedom equal to the number of restrictions.

If the null hypothesis includes $\tilde{a} = 0$, then the asymptotic distribution is a mixed chi-square distribution. Table 1 presents the test results of various null-hypotheses about the estimated parameters:

Table 1

Null Hypothesis	Log-likelihood value	Test statistics $\lambda=-2[L(H_0-)L(H_1])$	Critical value at 5% probability level	Critical value at 1% probability level	Decision
Cobb-Douglas Production Specification $H_0=\beta_{LL}=\beta_{KK}=\beta_{LK}=\beta_{tt}=\beta_{Lt}=\beta_{Kt}=0$	-196.99	45.98	12.59	16.81	Reject H_0
No technological change $H_0=\beta_t=\beta_{tt}=\beta_{Lt}=\beta_{Kt}=0$	-198.12	48.24	9.49	13.28	Reject H_0
Neutral technological change $H_0=\beta_{Lt}=\beta_{Kt}=0$	-192.84	37.68	5.99	9.21	Reject H_0
No technical inefficiency effects $H_0:\gamma=\mu=\eta=0$	-174.14	0.28	7.81	11.34	Accept H_0

At first we test whether Cobb-Douglas production functions are adequate to describe underlying technology. The test statistics H_0: $\hat{a}_{LL}=\hat{a}_{KK}=\hat{a}_{LK}=\hat{a}_{tt}=\hat{a}_{Lt}=\hat{a}_{Kt}=0$ as shown in Table 1, imply acceptance of null hypotheses. However, statistical tests suggest that the null-hypotheses are rejected. In Table 1 a likelihood ratio of the value 45.98 indicates the rejection of null hypothesis at 1% level of significance. Thus, Cobb-Douglas production functions are not adequate specifications for the manufacturing industries in West Bengal given the assumption of the translog stochastic frontier production model. This implies that the translog production better describes the technology of the West Bengal manufacturing.

The second null hypotheses of no technological change (H_0: $\hat{a}_t=\hat{a}_{tt}=\hat{a}_{Lt}=\hat{a}_{Kt}=0$) over time are rejected too. The value of the test statistic as shown in Table 1 is 48.24 which is significantly larger than the critical value of 13.28 at 1% probability level. This indicates the existence of technological change over time, given the specified production model.

The third null-hypotheses concern the neutral technological progress (i.e., H_0: $\hat{a}_{Lt}=\hat{a}_{Kt}=0$). The value of the test statistic in this case is 37.68 which is much greater than the critical value of 9.21 at 1% probability level. This indicates that the translog parameterization of the stochastic frontier model does not allow for Hicks neutral technological change.

The stochastic frontier model, as we have pointed out earlier, enables us to test the hypothesis of existence or non-existence of the technical inefficiency, expressed by H_0: ã=ì=ç=0. The test result shows that the hypothesis is accepted. This implies that the traditional production function is an appropriate representation for the organized manufacturing industries in West Bengal. In this case, it can be said that technical inefficiency effects are totally absent in the West Bengal manufacturing industries.

IV.1. Empirical Results

The estimation of parameters in the stochastic frontier model given by equations (20) and (21) has been carried out by maximum-likelihood (ML) method, using the program FRONTIER 4.1(Coelli, 1996). Instead of directly estimating ^2_v and $^2_{u,}$ FRONTIER 4.1 seeks to estimate ã=$^2_u/^2$ and $^2=^2_u+^2_v$, the results of which are presented in Table 2. These are associated with the variances of the stochastic term in the production function, v_{it} and the inefficiency term u_{it}. The parameter ã must lie between zero and one. If the hypothesis ã=0 is accepted, this would indicate that ^2_u is zero and thus the efficiency error term, u_{it} should be removed from the model, leaving a specification with parameters that can be consistently estimated by OLS. Conversely, if the value of ã is one, we have the full-frontier model, where the stochastic term is not present in the model.

Table 2: Panel Estimation of Stochastic Production Frontier and Technical Efficiency Model

Variables	Parameters	Coefficients	Standard Errors	t-statistics
Constant	β_0	-1.12	1.95	-0.58
lnL	β_L	1.13	0.56	2.02
lnK	β_K	0.05	0.34	0.14
t	β_t	-0.0012	0.03	-0.04
lnL^2	β_{LL}	-0.11	0.05	-2.26
lnK^2	β_{KK}	- 0.12	0.03	-4.55
t^2	β_{tt}	-0.0008	0.0003	-2.53
lnL lnK	β_{LK}	0.21	0.06	3.29
lnL t	β_{Lt}	-0.02	0.005	-3.89
lnK t	β_{Kt}	0.03	0.004	5.91
Sigma squared	$?^2$	0.71	1.15	0.62
Gamma	?	0.83	0.27	3.08
Mu	μ	-0.91	3.15	-0.29
Eta	η	-0.0007	0.006	-0.11
	Log-Likelihood	-174.00		

Source: Authors' own calculation

(*, **, * denotes statically significant at the 10, 5 and 1 percent levels respectively)**

The maximum likelihood estimates for the translog stochastic frontier production function are reported in Table 2. Almost all the estimated coefficients of the translog stochastic frontier production function are found to be statistically significant at the conventional levels. However, as under translog specification there may exist high level of multicollinearity due to the interaction and squared terms, certain estimated coefficients are found to be statistically insignificant. In Table 2 it is also found that the estimated value of gamma (ã) is as high as 0.83 which implies that the organized manufacturing industries in West Bengal are operating at 83% of their potential output determined by the frontier technology. However, statistical tests suggest that technical inefficiency of the organized manufacturing industries in West Bengal does not exist at all. Therefore, in the event of absence of technical efficiency change, TFPG of the organized manufacturing industries in West Bengal is calculated as the sum of adjusted scale effect and technical progress.

Based on the translog production function estimates shown in Table 2 we derive the following measures: the output elasticity with respect to factor inputs (e_L & e_K), returns to scale (e), the adjusted scale effect (ASE), rate of technological progress ($\dot{A}_t$), and the growth of technical efficiency ($\dot{TE}_t$). These measures are then used to derive the components of output and total factor productivity growth ($\dot{TFP}_t$). As the translog specification is used because of its superiority over the traditional production function, (this has been established above) the performance of these measures varies across industries and over years. For the sources of the output growth, Tables (3) – (5) show that: the major contributor to the output growth is input growth, while technological progress () is the major contributor to TFPG of the organized manufacturing industries of almost all the 2-digit industries in West Bengal as well as that of the state's total manufacturing during the whole study period, pre-reform and post-reform periods, and during the two decades of the post-reform period. The contributions of the inputs' growth to the growth of output are found to be relatively higher than those of TFPG for the manufacturing industries in West Bengal during the whole period under study as well as during both the pre-& post-reform periods. The statistical tests further suggest that the industries under study do not suffer from technical inefficiency. The scale effects are found to be negative in most of the cases or they are found to be negligible.

Table 3

Average Annual Growth Rate(%) of Output and its Components of the Thirteen 2-Digit Manufacturing Industries as well as Total Manufacturing in W.B.during 1981-82 to 2010-11					
Industries	*Y* (1=2+5)	Φ (2)	*ASE* *(3)*	*A* (4)	*TFP* (5=3+4)
Food & Food Products (20-21)	2.55	2.16	-0.04	0.43	0.39
Beverages &Tobacco Products (22)	4.89	4.37	0.01	0.52	0.52
Textiles & Textile Products (23+24+25+26)	-0.51	-0.23	0.02	-0.30	-0.28
Wood & Wood Products(27)	1.43	3.16	0.14	-1.87	-1.73
Paper & Paper Products(28)	1.46	0.07	-0.01	1.40	1.39
Leather & Leather Products(29)	1.87	3.05	0.06	-1.20	-1.18
Chemicals & Chemical Products(30)	4.29	-0.30	0.01	4.61	4.62
Rubber, Petroleum & Coal Products (31)	4.69	0.34	-0.01	4.36	4.35
Non-Metallic Mineral Products(32)	1.71	0.88	0.02	0.81	0.83
Basic Metals & Alloys(33)	5.49	0.56	-0.01	4.94	4.93
Metal Products & Machinery (34+35+36)	1.83	0.54	-0.04	1.33	1.29
Transport Equipments (37)	-4.37	-4.15	0.03	-0.25	-0.23
Other Manufacturing Industries(38)	-1.47	-1.07	-0.15	-0.30	-0.40
Total Manufacturing	4.44	-0.15	0.04	4.54	4.58
Average Annual Growth Rate(%) of Output and its Components of the Thirteen 2-Digit Manufacturing Industries as well as Total Manufacturing in W.B.during 1981-82 to 2010-11					
Industries	*Y* (1=2+5)	Φ (2)	*ASE* *(3)*	*A* (4)	*TFP* (5=3+4)
Food & Food Products (20-21)	2.55	2.16	-0.04	0.43	0.39
Beverages &Tobacco Products (22)	4.89	4.37	0.01	0.52	0.52
Textiles & Textile Products (23+24+25+26)	-0.51	-0.23	0.02	-0.30	-0.28
Wood & Wood Products(27)	1.43	3.16	0.14	-1.87	-1.73
Paper & Paper Products(28)	1.46	0.07	-0.01	1.40	1.39
Leather & Leather Products(29)	1.87	3.05	0.06	-1.20	-1.18
Chemicals & Chemical Products(30)	4.29	-0.30	0.01	4.61	4.62
Rubber, Petroleum & Coal Products (31)	4.69	0.34	-0.01	4.36	4.35
Non-Metallic Mineral Products(32)	1.71	0.88	0.02	0.81	0.83
Basic Metals & Alloys(33)	5.49	0.56	-0.01	4.94	4.93
Metal Products & Machinery (34+35+36)	1.83	0.54	-0.04	1.33	1.29
Transport Equipments (37)	-4.37	-4.15	0.03	-0.25	-0.23
Other Manufacturing Industries(38)	-1.47	-1.07	-0.15	-0.30	-0.40
Total Manufacturing	4.44	-0.15	0.04	4.54	4.58

Table 4

Panel 1: Average Annual Growth Rate(%) of Output and its Components of the Thirteen 2-Digit Manufacturing Industries as well as Total Manufacturing in W.B. during 1981-82 to 1990-91 (Pre-reform Period)					
Industries	*Y* (1=2+5)	Φ (2)	*ASE* *(3)*	*A* (4)	*TFP* (5=3+4)
Food & Food Products (20-21)	-1.03	-0.94	-0.02	-0.10	-0.09
Beverages &Tobacco Products (22)	-3.39	-4.80	-0.23	1.60	1.36
Textiles & Textile Products (23+24+25+26)	-1.10	-1.08	010	-0.12	-0.02
Wood & Wood Products(27)	-2.24	0.67	0.03	-2.93	-2.91
Paper & Paper Products(28)	-1.60	-3.06	0.02	1.45	1.47
Leather & Leather Products(29)	-5.80	-3.30	0.01	-2.50	-2.49
Chemicals & Chemical Products(30)	1.48	-2.70	0.04	4.19	4.23
Rubber, Petroleum & Coal Products (31)	3.85	0.67	-0.02	3.20	3.18
Non-Metallic Mineral Products(32)	-2.41	-1.90	-0.01	-0.50	-0.50
Basic Metals & Alloys(33)	5.57	1.08	-0.07	4.56	4.50
Metal Products & Machinery (34+35+36)	0.72	-0.78	0.05	1.44	1.50
Transport Equipments (37)	-4.32	-4.81	0.21	0.28	0.49
Other Manufacturing Industries(38)	0.22	0.88	0.02	-0.70	-0.70
Total Manufacturing	3.61	-1.09	0.12	4.58	4.70
Panel 2: Average Annual Growth Rate(%) of Output and its Components of the Thirteen 2 -Digit Manufacturing Industries as well as Total Manufacturing in W.B. during 1991-92 to 2010-11(Post-reform Period)					
Industries	*Y* (1=2+5)	Φ (2)	*ASE* *(3)*	*A* (4)	*TFP* (5=3+4)
Food & Food Products (20-21)	4.34	3.71	-0.05	0.69	0.64
Beverages &Tobacco Products (22)	9.02	8.92	0.12	-0.02	0.10
Textiles & Textile Products (23+24+25+26)	-0.22	0.20	-0.02	-0.40	-0.41
Wood & Wood Products(27)	3.26	4.40	0.20	-1.34	-1.14
Paper & Paper Products(28)	2.98	1.63	-0.03	1.38	1.35
Leather & Leather Products(29)	5.70	6.22	0.09	-0.60	-0.53
Chemicals & Chemical Products(30)	5.69	0.87	-0.01	4.82	4.82
Rubber, Petroleum & Coal Products (31)	5.11	0.17	-0.01	4.94	4.94
Non-Metallic Mineral Products(32)	3.78	2.29	0.05	1.44	1.49
Basic Metals & Alloys(33)	5.45	0.30	0.03	5.12	5.15
Metal Products & Machinery (34+35+36)	2.39	1.21	-0.09	1.27	1.18
Transport Equipments (37)	-4.40	-3.81	-0.07	-0.52	-0.58
Other Manufacturing Industries(38)	-2.31	-2.04	-0.23	-0.01	-0.30
Total Manufacturing	4.85	0.33	-0.01	4.52	4.52

Table 5

Panel 1: Average Annual Growth Rate(%) of Output and its Components of the Thirteen 2-Digit Manufacturing Industries as well as Total Manufacturing in W.B.during 1991-92 to 2000-01 (Decade 1: Post-reform Period)					
Industries	*Y* (1=2+5)	Φ (2)	*ASE* (3)	*A* (4)	*TFP* (5=3+4)
Food & Food Products (20-21)	1.90	1.52	-0.03	0.41	0.38
Beverages &Tobacco Products (22)	15.30	14.80	0.30	0.18	0.48
Textiles & Textile Products (23+24+25+26)	0.85	0.78	-0.07	0.14	0.07
Wood & Wood Products(27)	-0.92	1.48	0.02	-2.43	-2.40
Paper & Paper Products(28)	1.73	-0.31	-0.05	2.09	2.04
Leather & Leather Products(29)	1.53	2.82	-0.10	-1.20	-1.29
Chemicals & Chemical Products(30)	4.26	0.98	-0.01	3.29	3.28
Rubber, Petroleum & Coal Products (31)	1.13	-3.03	-0.15	4.31	4.16
Non-Metallic Mineral Products(32)	1.63	0.92	-0.10	0.77	0.71
Basic Metals & Alloys(33)	2.85	-2.84	0.09	5.59	5.68
Metal Products & Machinery (34+35+36)	-1.28	-2.75	-0.11	1.58	1.47
Transport Equipments (37)	-5.84	-5.35	-0.10	-0.38	-0.49
Other Manufacturing Industries(38)	-3.13	-2.59	-0.29	-0.20	-0.50
Total Manufacturing	2.84	-2.15	0.20	4.79	4.99
Panel 2: Average Annual Growth Rate(%) of Output and its Components of the Thirteen 2-Digit Manufacturing Industries as well as Total Manufacturing in W.B.during 2001-02 to 2010-11(Decade 2: Post-reform Period)					
Industries	*Y* (1=2+5)	Φ (2)	*ASE* (3)	*A* (4)	*TFP* (5=3+4)
Food & Food Products (20-21)	6.79	5.89	-0.07	0.97	0.90
Beverages &Tobacco Products (22)	2.79	3.07	-0.06	-0.23	-0.28
Textiles & Textile Products (23+24+25+26)	-1.28	-0.39	0.03	-0.93	-0.89
Wood & Wood Products(27)	7.44	7.32	0.37	-0.25	0.12
Paper & Paper Products(28)	4.23	3.57	-0.01	0.67	0.66
Leather & Leather Products(29)	9.86	9.63	0.24	-0.01	0.23
Chemicals & Chemical Products(30)	7.11	0.75	0.01	6.36	6.36
Rubber, Petroleum & Coal Products (31)	9.09	3.37	0.15	5.56	5.71
Non-Metallic Mineral Products(32)	5.92	3.65	0.15	2.12	2.27
Basic Metals & Alloys(33)	8.06	3.44	-0.04	4.65	4.61
Metal Products & Machinery (34+35+36)	6.06	5.16	-0.08	0.97	0.90
Transport Equipments (37)	-2.95	-2.28	-0.03	-0.65	-0.68
Other Manufacturing Industries(38)	-1.50	-1.49	-0.17	0.17	-0.01
Total Manufacturing	6.86	2.81	-0.20	4.25	4.05

Source: Authors' own calculation

IV.2. Analysis of Fluctuations in the Growth Rates of Output and TFPG

The annual growth rates of the components of output are found to have fluctuated widely over the years as shown in Tables 6 through 10 in the Appendix below. So far as the average annual growth rates are concerned, it is found that those of TP component of some of the the 2-digit manufacturing industries such as beverages and tobacco products (22-23), paper and paper products (28), metal products and machinery (34+35+36) as well as total manufacturing in the state have declined during the post-reform period. This decline in TP may be explained by the fact that economic reforms failed to increase competition through improved technology and opening of the organized manufacturing industries in the state. Further, the decline in TFPG in these 2-digit industries of the state over the years is mainly responsible for the decline in TP during the period. From the values of the returns to scale component (RTS) (see Tables 3 to 5) it can be concluded that the contribution of scale effects to TFPG of the 2-digit manufacturing industries and that of all the manufacturing industries as a whole in the state are very low or even negative in most of the cases. (The scale effects, which measure the effect of input changes on output growth, will be zero if RTS is constant; it will be greater (less) than zero if RTS is increasing or decreasing (assuming positive input growth) [Kim and Han, 2001]). This situation could probably be due to higher unit cost of production. It can, therefore, be said that the manufacturing industries in West Bengal could not reap the benefits of the economies of scale during the period under consideration.

V. Summary & Conclusions

The paper examines and applies the theoretical foundation of the decomposition of output and productivity growth of the 2-digit manufacturing industries as well as total manicuring industry in West Bengal. Our theoretical discussion follows that of Solow (1957), Denny et al. (1981), Bauer (1990), and Kumbhakar and Lovell (2000) and shows that cost information is not required in estimating the components of decomposition and the production function approach is sufficient for the empirical work. Output growth in the study is decomposed into input growth and TFPG and TFPG into adjusted scale effect and technological progress as statistical tests suggests that there exist no technical inefficiency effects. The growth of aggregate input is the weighted sum of each input growth and the weight being the cost share of each input. The adjusted scale effect depends on the size of returns to scale. This effect is zero for constant returns to scale, but is adjusted by the aggregate input growth for increasing and decreasing returns to scale. Technological progress in the decomposition represents the shift of the production function over time. For our empirical work on the production function, we have derived the series of capital stocks data using the inventory accumulation method for the thirteen 2-digit manufacturing industries in West Bengal during the period from 1981-82 to 2010-11.

We have actually extended the decomposition of output and TFP growth analysis in Li and Liu (2011) with stochastic frontier analysis. We estimate the stochastic frontier translog production function using the maximum-likelihood estimation method. Our empirical results show that the two factor inputs (labor and capital) are important for output performance in the West Bengal economy. Among the two inputs, capital is the most important factor in West Bengal manufacturing during the post-reform economic growth. This is due to the fact that in a labour surplus state like West Bengal increase in capital stock will increase productivity of labour. When the two sources of the growth of TFP in West Bengal manufacturing are concerned, we found that the major contributor to the TFP growth is technological progress. The contribution from adjusted scale effect is also increasing in few industries during the recent years.

The empirical results do bring forward several policy implications on the sustainability of the post-reform West Bengal economy. It is necessary for West Bengal to promote investments that are more productive, especially those embodied with labour intensive technology. Policies should be geared to improve technological progress and to improve economies of scale of production. While labor is available in plenty emphasis should be given on developing human capital for the economic development of the state. However, it will take a relatively long time for individuals to be properly educated and trained.

APPENDIX

Table 6: Rate (%) of Output Growth

YEAR	20-21	22	23+24+25+26	27	28	29	30	31	32	33	34+35+36	37	38	Total
1981-82	9.69	-0.68	-8.6	-7.8	2.35	-13	3.79	4.78	10.1	6.63	4.59	1.83	-14.1	0.75
1982-83	-44.3	-12.9	4.55	-9.49	6.21	-2.7	5.06	-18.8	8.19	7.5	-0.74	5.47	0.152	6.9
1983-84	23.4	-2.32	-5.59	-3.51	-5.9	-5.2	0.81	21.8	-2.24	6.34	-2.69	-1.72	7.221	13.1
1984-85	-6.87	-1.04	14.5	-7.68	-28	-18	-6.6	-15.5	-36.4	23.4	-7.41	-7.02	-19	-4.3
1985-86	12.8	31.7	-20.3	-8.92	6.07	12.8	11.2	-10.5	8.42	-13.2	-3.69	-22.4	-6.05	-1.5
1986-87	-17.1	-2.53	-10.8	12.7	-18	-27	0.44	28.1	-14.4	-3.83	-5.59	3.32	15.45	-5.2
1987-88	-5.97	24.9	0.39	-29.1	18	-6	12.6	-1.18	1.18	-4.41	9.05	-6.28	-0.38	6.71
1988-89	11.1	-23.2	15.4	19.3	-6.2	4.14	-12	21.9	6.5	6.27	8.59	13.3	-3.68	10.2
1989-90	10	-19.7	2.86	19.6	-6.4	-5.5	-3.8	-5.14	7.8	-0.75	-8.1	-26.6	12.88	3.52
1990-91	-3.12	-28	-3.43	-7.51	15.4	2.88	2.88	13.1	-13.2	27.8	13.17	-3.08	9.711	6.08
1991-92	1.14	54.6	-0.89	8.04	5.83	-8.8	10.1	-30.2	13.2	8.78	0.61	14.8	-7.78	11.5
1992-93	7.65	61.7	-6.57	-16	-2.9	-4.7	0.2	45.9	-5.71	11.2	-1.44	-9.32	-2.62	8.49
1993-94	-1.25	-32.3	-6.19	17.7	-3.7	13.4	-0.8	-4.45	13.3	2.75	4.49	12.4	14.95	6.3
1994-95	3.21	44	5.02	-1.36	10.7	0.9	11.9	2.67	-6.11	8.01	-3.98	-6.78	-2.52	7.28
1995-96	-6.82	-6.73	33.5	-28.3	28.2	3.59	-2	-1.36	21.8	2.6	10.51	-0.38	-38.3	12.5
1996-97	-0.92	-26.8	-13.1	37.4	-14	-58	8.38	5.05	-14.2	1.94	-5.41	15.4	-26.3	-2
1997-98	31.1	43.9	9.78	-31.1	-7.8	46.4	-12	8.87	-21.3	4.99	-18.9	-25.1	57.94	11.1
1998-99	-17.4	-20.9	-14.9	15.3	7.03	34.2	11.3	-29.9	-22.8	-20.9	61.54	-70.3	36.04	-33
1999-00	13.7	13.2	10.6	-14.3	-4.4	5.79	13.7	14	54.1	6.08	-44.7	10.5	-60.1	5.04
2000-01	-11.4	21.7	-8.78	3.46	-1.4	-18	2.16	0.66	-16	3	-15.5	0.35	-2.61	1.33
2001-02	8.8	19.3	-13.8	38.7	-31	5.3	24.8	9.18	6	3.71	-4.22	-9.59	-25.3	8.16
2002-03	0.58	-7.42	2.42	-2.97	-1.6	1.79	3.68	4.72	5.04	-1.63	-1.33	-14.1	20.37	2.46
2003-04	3.95	14.3	-0.42	-12	7.56	0.1	-8.1	2.6	4.82	-3.3	-1.72	-11.5	-13	0.62
2004-05	13.1	-17.2	0.39	2.29	0.53	11	12.4	4.74	5.06	3.29	-3.64	10.7	-11.6	4.17
2005-06	3.26	26.3	-8.95	-1.99	-2.5	13	1.46	20.6	-3.32	8.51	-0.78	-26.5	24.06	3.45
2006-07	-1.31	-23.4	-13.2	-3.72	45.6	-28	4.54	-19.9	-6.55	21.1	15.73	0.17	-28.3	3
2007-08	3.66	-8.17	15.8	32.9	-35	9.73	6.38	17	-6.65	8.35	-13.6	8.97	-4.41	7.29
2008-09	10.4	34.1	-7.02	22.8	16.1	60.1	19.8	28.4	27.5	11.4	14.11	12.1	-34.7	14.2
2009-10	22.6	-26	5.66	-13.1	-4.8	27.6	-10	15.2	6.77	18.8	30.14	-3.79	-7.15	14.5
2010-11	2.8	16.3	6.28	11.4	47.6	-1.8	16.1	8.39	20.5	10.4	25.82	3.87	65.15	10.7
Average: 1981-82 To 2010-11 (Total period)	**2.55**	**4.89**	**-0.51**	**1.43**	**1.46**	**1.87**	**4.29**	**4.69**	**1.71**	**5.49**	**1.83**	**-4.37**	**-1.47**	**4.44**
Average: 1981-82 To	**-1.03**	**-3.39**	**-1.10**	**-2.24**	**-1.60**	**-5.80**	**1.48**	**3.85**	**-2.41**	**5.57**	**0.72**	**-4.32**	**0.216**	**3.61**

1990-91 (Pre-reform period)														
Average: 1991-92 To 2010-11 (Post-reform period)	**4.34**	**9.02**	**-0.22**	**3.26**	**2.98**	**5.70**	**5.69**	**5.11**	**3.78**	**5.45**	**2.39**	**-4.40**	**-2.31**	**4.85**
Average: 1991-92 To 2000-01 (Post-reform period-Decade 1)	**1.90**	**15.30**	**0.85**	**-0.92**	**1.73**	**1.53**	**4.26**	**1.13**	**1.63**	**2.85**	**-1.28**	**-5.84**	**-3.13**	**2.84**
Average: 2001-02 To 2010-11 (Post-reform period-Decade 2)	**6.79**	**2.79**	**-1.28**	**7.44**	**4.23**	**9.86**	**7.11**	**9.09**	**5.92**	**8.06**	**6.06**	**-2.95**	**-1.50**	**6.86**

Source: Authors' own calculation

Table 7: Rate (%) of Input Growth Effect

YEAR	20-21	22	23+24+25+26	27	28	29	30	31	32	33	34+35+36	37	38	Total
1981-82	9.57	0.3	-9.2	-4.6	0.9	-11	-1.3	1.41	10	2.33	3.11	1.09	-13.2	-4.29
1982-83	-46.1	-12	5.39	-6.1	4.97	-0.9	0.3	-22.3	8.34	3.37	-2.46	4.97	0.84	2.96
1983-84	24.8	-1.6	-5.91	-0.3	-7.48	-3.1	-3.8	18.8	-2.2	1.97	-4.3	-2.41	7.57	10.1
1984-85	-7.06	-3.1	16.4	-4.1	-29.2	-17	-11	-18.4	-36	19.7	-9.2	-7.94	-17.9	-10.2
1985-86	13.4	24.9	-21.6	-5.5	4.71	14.9	6.94	-13.6	9.02	-18.7	-5.32	-24.2	-4.87	-6.84
1986-87	-17.5	-6.9	-11	15.2	-19.3	-24	-4.1	24.6	-14	-8.24	-7.25	3.06	16.2	-10.8
1987-88	-5.75	20.8	0.36	-25	16.3	-3	8.83	-4.46	1.76	-8.93	7.91	-6.83	0.83	2.26
1988-89	11.9	-24	16.2	21.2	-7.51	7.27	-15	18.9	7.03	1.92	7.38	13.9	-2.82	6.05
1989-90	10.5	-20	2.67	21.3	-7.69	-2.5	-7.4	-8.21	8.73	-5.79	-9.95	-27.4	12.7	-1.39
1990-91	-3.19	-27	-4.08	-5.1	13.8	5.71	-0.6	9.91	-12	23.2	12.3	-2.38	9.45	1.34
1991-92	1.18	51.3	-0.83	10.4	4.74	-5.6	6.95	-33.1	13.8	2.62	-0.97	15.7	-7.21	7.03
1992-93	8.01	59.3	-6.69	-13	-4.06	-2.1	-2.9	41.8	-5.9	4.93	-3.13	-9.88	-2.09	3.33
1993-94	-1.3	-31	-6.33	18.7	-5.2	14.8	-3.8	-8.51	13.1	-3.77	3.06	13.6	14.9	0.78
1994-95	3.23	43.2	5.54	0.8	8.93	2.37	9.23	-1.21	-6.7	1.66	-5.97	-5.61	-1.51	2.07
1995-96	-7.03	-7.4	36.1	-25	26.4	4.57	-4.8	-5.12	20.3	-3.71	9.17	0.98	-36.1	7.94
1996-97	-2.02	-25	-14.8	38.9	-15.4	-54	5.53	1.28	-14	-4.15	-6.83	17.3	-24.8	-7.88
1997-98	30.8	43.9	10.1	-27	-9.79	46.3	-15	4.52	-21	0.89	-20.4	-25.7	56.6	8.11
1998-99	-18.3	-20	-16.7	17.2	3.06	33.2	8.49	-33.7	-24	-25.6	62.7	-70.5	36.5	-40.7
1999-00	13	13.2	10.5	-11	-8.13	5.53	9.9	8.44	51.3	0.89	-47.8	10.3	-58.3	1.05
2000-01	-12.4	20.7	-9.03	4.75	-3.68	-17	-3.8	-4.71	-17	-2.15	-17.3	0.26	-3.92	-3.3
2001-02	8.14	18.6	-14.1	37.4	-31.1	4.95	17.1	3.43	3.42	-1.24	-5.67	-9.44	-24.8	3.88
2002-03	-0.06	-7.7	3.18	-2.6	-2.63	1.31	-3.4	-0.83	2.93	-6.35	-2.63	-13.4	18.1	-2.1
2003-04	3.21	13.8	0.23	-11	6.35	-0.1	-15	-2.61	2.45	-7.91	-2.7	-10.6	-13.1	-3.9
2004-05	12.5	-17	1.52	2.04	-0.33	10.3	5.78	-0.59	2.56	-1.19	-4.24	11.2	-11.5	0.14
2005-06	2.74	26.6	-8.02	-1.9	-3.16	12.6	-4.5	14.7	-5.2	4.2	-1.16	-25.3	22.4	-0.47
2006-07	-1.99	-22	-12.5	-2.7	43.9	-27	-1.6	-23.7	-7.9	17	15.6	1.26	-26.6	-0.92
2007-08	2.88	-6.9	18.1	31.6	-34.2	8.74	0.09	11.2	-8.3	3.82	-14.1	9.8	-3.68	3.49
2008-09	9.08	35	-6.27	21.7	16.9	58.5	13.3	20.8	24	6.38	13.4	12.5	-30.9	10.5
2009-10	20.8	-25	6.74	-13	-4.97	27.9	-15	8.08	4.31	14	28.8	-3.06	-5.86	10.7
2010-11	1.66	15.6	7.16	11.3	44.9	-0.9	10.6	3.23	18.2	5.78	24.3	4.19	61	6.8
Average: 1981-82 To 2010-11 (Total period)	2.16	4.37	-0.23	3.16	0.07	3.05	-0.30	0.34	0.88	0.56	0.54	-4.15	-1.07	-0.15
Average: 1981-82 To 1990-91 (Pre-reform period)	**-0.94**	**-4.80**	**-1.08**	**0.67**	**-3.06**	**-3.30**	**-2.70**	**0.67**	**-1.90**	**1.08**	**-0.78**	**-4.81**	**0.88**	**-1.09**

Average: 1991-92 To 2010-11 (Post-reform period)	**3.71**	**8.92**	**0.20**	**4.40**	**1.63**	**6.22**	**0.87**	**0.17**	**2.29**	**0.30**	**1.21**	**-3.81**	**-2.04**	**0.33**
Average: 1991-92 To 2000-01 (Post-reform period-Decade 1)	**1.52**	**14.80**	**0.78**	**1.48**	**-0.31**	**2.82**	**0.98**	**-3.03**	**0.92**	**-2.84**	**-2.75**	**-5.35**	**-2.59**	**-2.15**
Average: 2001-02 To 2010-11 (Post-reform period-Decade 2)	**5.89**	**3.07**	**-0.39**	**7.32**	**3.57**	**9.63**	**0.75**	**3.37**	**3.65**	**3.44**	**5.16**	**-2.28**	**-1.49**	**2.81**

Source: Authors' own calculation

Table 8: Rate (%) Scale Change

YEAR	20-21	22	23+24+25+26	27	28	29	30	31	32	33	34+35+36	37	38	Total
1981-82	-0.5	0.01	0.93	-0.09	-0.02	0.07	0.02	-0.02	-0.2	-0.13	-0.2	-0.07	-0.18	0.53
1982-83	1.627	-0.36	-0.54	-0.14	-0.13	0	-0.01	0.052	-0.2	-0.19	0.16	-0.32	0.01	-0.37
1983-84	-1.16	-0.06	0.57	-0.01	0.16	0.01	0.07	-0.12	0.04	-0.11	0.26	0.15	0.11	-1.29
1984-85	0.3	-0.12	-1.64	-0.12	0.26	-0	0.14	0.054	0.12	-1.16	0.55	0.49	-0.45	1.23
1985-86	-0.6	1.47	1.95	-0.15	-0.05	0.07	-0.09	-0.07	-0.1	0.9	0.29	1.19	-0.11	0.77
1986-87	0.646	-0.43	0.99	0.46	-0.01	-0.1	0.05	0.012	0.02	0.41	0.36	-0.15	0.32	1.22
1987-88	0.199	1.1	-0.03	-0.97	-0.04	-0.01	-0.08	-0.02	-0.01	0.41	-0.4	0.31	0.02	-0.24
1988-89	-0.44	-1.12	-1.29	0.77	-0.02	0.04	0.22	-0.05	0.01	-0.08	-0.36	-0.69	-0.06	-0.65
1989-90	-0.39	-1.07	-0.21	0.68	-0.01	-0.01	0.04	-0.01	-0.01	0.21	0.46	1.07	0.33	0.15
1990-91	0.107	-1.75	0.31	-0.19	0.06	0.06	0	0.004	-0.01	-0.94	-0.59	0.1	0.25	-0.14
1991-92	-0.04	2.26	0.06	0.37	0	-0.1	-0.04	-0.46	-0.1	-0.09	0.04	-0.74	-0.22	-0.72
1992-93	-0.26	1.98	0.52	-0.47	-0.01	-0.01	0.01	0.148	-0.1	-0.16	0.13	0.3	-0.06	-0.33
1993-94	0.04	-0.9	0.45	0.76	-0.04	0.3	0.01	-0.1	0.08	0.11	-0.13	-0.54	0.43	-0.08
1994-95	-0.09	0.8	-0.4	0.03	0.08	0.05	-0.04	-0.02	-0.1	-0.05	0.22	0.24	-0.04	-0.2
1995-96	0.176	-0.21	-2.84	-1.14	0	0.11	0.01	-0.07	0.24	0.1	-0.33	-0.04	-1.38	-0.79
1996-97	0.043	-1.11	1.03	1.38	-0.16	-2.6	-0.01	0.021	-0.3	0.1	0.24	-0.77	-1.37	0.73
1997-98	-0.56	0.27	-0.67	-1.15	-0.06	1.14	-0.08	0.068	-0.4	-0.02	0.59	0.93	2.24	-0.79
1998-99	0.46	-0.74	1.14	0.74	0.07	0.98	0.03	-1.18	-0.9	0.93	-3.07	-0.39	0.54	3.94
1999-00	-0.26	0.19	-0.59	-0.51	-0.26	0.15	0.03	0.29	1.34	-0.02	0.92	0	-2.81	-0.09
2000-01	0.187	0.46	0.59	0.23	-0.12	-0.7	-0.06	-0.19	-0.4	0.04	0.33	-0.01	-0.25	0.28
2001-02	-0.13	0.25	0.85	1.88	-0.86	0.17	0.42	0.139	0.13	0.02	0.09	-0.05	-1.67	-0.3
2002-03	8E-04	-0.15	-0.19	-0.13	-0.08	0.05	-0.09	-0.04	0.11	0.08	0.04	-0.12	1.16	0.16
2003-04	-0.05	0.2	-0.01	-0.69	0.2	-0.01	-0.47	-0.12	0.08	0.08	0.03	-0.12	-0.91	0.29
2004-05	-0.18	-0.39	-0.09	0.13	-0.01	0.4	0.17	-0.03	0.1	0.01	0.05	0.12	-0.86	-0.01
2005-06	-0.04	0.22	0.46	-0.13	-0.11	0.47	-0.14	0.64	-0.2	-0.03	0.01	-0.56	1.46	0.03
2006-07	0.029	-0.44	0.65	-0.18	0.77	-1.2	-0.05	-1.18	-0.4	-0.21	-0.24	0.03	-1.97	0.07
2007-08	-0.03	-0.17	-0.99	1.61	-1.25	0.42	0	0.536	-0.4	-0.05	0.13	0.15	-0.29	-0.25
2008-09	-0.12	0.15	0.32	1.2	0.28	1.76	0.42	0.953	1.09	-0.06	-0.13	0.24	-2.52	-0.74
2009-10	-0.19	-0.61	-0.32	-0.68	-0.09	0.33	-0.57	0.434	0.18	-0.14	-0.42	-0.06	-0.5	-0.74
2010-11	-0.02	0.37	-0.34	0.69	1.07	-0.01	0.35	0.143	0.72	-0.09	-0.31	0.09	4.39	-0.49
Average: 1981-82 To 2010-11 (Total period)	-0.04	0.01	0.02	0.14	-0.01	0.06	0.01	-0.01	0.02	-0.01	-0.04	0.03	-0.15	0.04
Average: 1981-82 To 1990-91 (Pre-reform period)	**-0.02**	**-0.23**	**0.10**	**0.03**	**0.02**	**0.01**	**0.04**	**-0.02**	**-0.01**	**-0.07**	**0.05**	**0.21**	**0.02**	**0.12**

Average: 1991-92 To 2010-11 (Post-reform period)	**-0.05**	**0.12**	**-0.02**	**0.20**	**-0.03**	**0.09**	**-0.01**	**-0.01**	**0.05**	**0.03**	**-0.09**	**-0.07**	**-0.23**	**-0.01**
Average: 1991-92 To 2000-01 (Post-reform period-Decade 1)	**-0.03**	**0.30**	**-0.07**	**0.02**	**-0.05**	**-0.10**	**-0.01**	**-0.15**	**-0.10**	**0.09**	**-0.11**	**-0.10**	**-0.29**	**0.20**
Average: 2001-02 To 2010-11 (Post-reform period-Decade 2)	**-0.07**	**-0.06**	**0.03**	**0.37**	**-0.01**	**0.24**	**0.01**	**0.149**	**0.15**	**-0.04**	**-0.08**	**-0.03**	**-0.17**	**-0.20**

Source: Authors' own calculation

Table 9: Rate (%) of Technological Progress

YEAR	20-21	22	23+24+25+26	27	28	29	30	31	32	33	34+35+36	37	38	Total
1981-82	0.62	-0.99	-0.32	-3.07	1.47	-1.8	5.09	3.39	0.22	4.43	1.68	0.82	-0.7	4.51
1982-83	0.17	-0.91	-0.29	-3.22	1.37	-1.9	4.77	3.43	0	4.32	1.56	0.82	-0.7	4.30
1983-84	-0.20	-0.66	-0.25	-3.19	1.41	-2.1	4.56	3.08	-0.1	4.48	1.35	0.54	-0.5	4.30
1984-85	-0.10	2.19	-0.27	-3.44	1.33	-1.9	4.5	2.84	-0.2	4.88	1.25	0.43	-0.7	4.68
1985-86	-0.10	5.25	-0.65	-3.28	1.4	-2.2	4.35	3.19	-0.5	4.57	1.35	0.53	-1.1	4.53
1986-87	-0.30	4.77	-0.77	-2.97	1.63	-3	4.52	3.43	-0.8	4	1.31	0.4	-1.1	4.39
1987-88	-0.40	2.99	0.07	-2.94	1.75	-3.1	3.82	3.3	-0.6	4.12	1.54	0.23	-1.2	4.69
1988-89	-0.30	1.39	0.53	-2.59	1.28	-3.2	3.24	3.08	-0.5	4.43	1.57	0.09	-0.8	4.77
1989-90	-0.10	1.17	0.41	-2.37	1.32	-3	3.61	3.08	-0.9	4.83	1.39	-0.29	-0.1	4.76
1990-91	-0.01	0.76	0.34	-2.27	1.54	-2.9	3.44	3.16	-1.2	5.59	1.44	-0.8	0.01	4.88
1991-92	-0.01	1.07	-0.12	-2.7	1.09	-3.1	3.20	3.41	-0.5	6.26	1.54	-0.14	-0.3	5.20
1992-93	-0.10	0.48	-0.39	-2.42	1.17	-2.5	3.07	3.95	0.21	6.4	1.56	0.26	-0.5	5.50
1993-94	0.01	-0.62	-0.31	-1.71	1.58	-1.7	2.93	4.16	0.13	6.41	1.56	-0.71	-0.4	5.59
1994-95	0.07	0.03	-0.12	-2.19	1.65	-1.5	2.73	3.9	0.71	6.4	1.77	-1.41	-1.0	5.41
1995-96	0.03	0.91	0.22	-2.58	1.79	-1.1	2.84	3.83	1.3	6.22	1.68	-1.31	-0.8	5.35
1996-97	1.06	-0.39	0.66	-2.84	1.32	-1.4	2.86	3.75	0.44	5.99	1.19	-1.22	-0.1	5.18
1997-98	0.90	-0.27	0.37	-2.85	2.03	-1.0	2.71	4.28	0.49	4.11	0.95	-0.25	-0.9	3.82
1998-99	0.40	0.17	0.67	-2.72	3.9	-0.01	2.78	5.01	1.8	3.78	1.87	0.65	-1.0	3.45
1999-00	0.88	-0.18	0.73	-2.71	3.99	0.10	3.76	5.3	1.45	5.21	2.18	0.2	1.01	4.08
2000-01	0.82	0.57	-0.33	-1.52	2.35	0.05	6.06	5.56	1.7	5.12	1.49	0.09	1.56	4.35
2001-02	0.79	0.42	-0.59	-0.56	0.98	0.17	7.28	5.62	2.46	4.93	1.36	-0.09	1.16	4.59
2002-03	0.64	0.39	-0.56	-0.29	1.13	0.42	7.13	5.59	2.0	4.63	1.26	-0.57	1.12	4.39
2003-04	0.79	0.27	-0.63	-0.09	1.00	0.19	6.92	5.33	2.28	4.54	0.95	-0.74	1.0	4.23
2004-05	0.84	-0.18	-1.04	0.123	0.87	0.27	6.44	5.36	2.39	4.47	0.55	-0.6	0.72	4.05
2005-06	0.56	-0.6	-1.39	-0.01	0.75	-0.10	6.15	5.23	2.04	4.34	0.37	-0.66	0.23	3.88
2006-07	0.65	-0.47	-1.38	-0.84	0.88	0.02	6.24	4.92	1.72	4.3	0.33	-1.12	0.21	3.85
2007-08	0.81	-1.09	-1.32	-0.37	0.19	0.57	6.28	5.3	1.97	4.59	0.45	-0.99	-0.4	4.05
2008-09	1.46	-1.08	-1.07	-0.07	-1.07	-0.1	6.14	6.62	2.38	5.09	0.85	-0.63	-1.3	4.49
2009-10	2.01	-0.18	-0.77	0.11	0.30	-0.7	5.85	6.65	2.29	4.92	1.73	-0.66	-0.8	4.55
2010-11	1.15	0.28	-0.54	-0.54	1.63	-0.9	5.13	5.02	1.64	4.73	1.85	-0.41	-0.3	4.43
Average: 1981-82 To 2010-11 (Total period)	**0.43**	**0.52**	**-0.30**	**-1.87**	**1.40**	**-1.20**	**4.61**	**4.36**	**0.81**	**4.94**	**1.33**	**-0.25**	**-0.30**	**4.54**
Average: 1981-82 To 1990-91 (Pre-reform period)	**-0.10**	**1.60**	**-0.12**	**-2.93**	**1.45**	**-2.50**	**4.19**	**3.20**	**-0.50**	**4.56**	**1.44**	**0.28**	**-0.70**	**4.58**

Table 11 Concordance between NIC'87, NIC'98 & NIC'04 and NIC'08		
NIC'87 code	**NIC'98 & NIC'04 code**	**NIC 2008 code**
20-21	151-154	101-108
22	155+160	110+120
23+24+25+26	171+172+173+181	131+139+141+143
27	20+361	16+310
28	21+22	17+18
29	182+191+192	142+151+152
30	24	20+21

Average: 1991-92 To 2010-11 (Post-reform period)	**0.64**	**0.10**	**-0.41**	**-1.14**	**1.35**	**-0.53**	**4.82**	**4.94**	**1.49**	**5.15**	**1.18**	**-0.58**	**-0.30**	**4.52**
Average: 1991-92 To 2000-01 (Post-reform period-Decade 1)	**0.38**	**0.48**	**0.07**	**-2.40**	**2.04**	**-1.29**	**3.28**	**4.16**	**0.71**	**5.68**	**1.47**	**-0.49**	**-0.50**	**4.99**
Average: 2001-02 To 2010-11 (Post-reform period-Decade 2)	**0.90**	**-0.28**	**-0.89**	**0.12**	**0.66**	**0.23**	**6.36**	**5.71**	**2.27**	**4.61**	**0.90**	**-0.68**	**-0.01**	**4.05**
Source: Authors' own calculation														

31	23+25	19+22
32	26	23
33	271+272+273+371	241+242+243
34+35+35	28+29+30+31+32	25+26+27+28
37	34+35	29+30
38	331+332+333+369	321+322+323+324+325+329

Average: 1991-92 To 2010-11 (Post-reform period)	**0.69**	**-0.02**	**-0.40**	**-1.34**	**1.38**	**-0.60**	**4.82**	**4.94**	**1.44**	**5.12**	**1.27**	**-0.52**	**-0.01**	**4.52**
Average: 1991-92 To 2000-01 (Post-reform period-Decade 1)	**0.41**	**0.18**	**0.14**	**-2.43**	**2.09**	**-1.20**	**3.29**	**4.31**	**0.77**	**5.59**	**1.58**	**-0.38**	**-0.20**	**4.79**
Average: 2001-02 To 2010-11 (Post-reform period-Decade 2)	**0.97**	**-0.23**	**-0.93**	**-0.25**	**0.67**	**-0.01**	**6.36**	**5.56**	**2.12**	**4.65**	**0.97**	**-0.65**	**0.17**	**4.25**

Source: Authors' own calculation

Table 10: Rate (%) of TFPG

YEAR	20-21	22	23+24+25+26	27	28	29	30	31	32	33	34+35+36	37	38	Total
1981-82	0.13	-0.99	0.6	-3.16	1.45	-1.68	5.11	3.37	0.05	4.29	1.48	0.745	-0.9	5.04
1982-83	1.8	-1.27	-0.84	-3.36	1.24	-1.85	4.76	3.48	-0.16	4.13	1.72	0.495	-0.7	3.94
1983-84	-1.34	-0.72	0.32	-3.2	1.56	-2.13	4.63	2.96	-0.06	4.37	1.62	0.69	-0.3	3.02
1984-85	0.19	2.07	-1.91	-3.56	1.58	-1.92	4.64	2.9	-0.12	3.72	1.79	0.92	-1.1	5.91
1985-86	-0.69	6.72	1.3	-3.43	1.35	-2.13	4.26	3.12	-0.6	5.47	1.63	1.725	-1.2	5.3
1986-87	0.38	4.35	0.22	-2.51	1.62	-3.06	4.57	3.44	-0.79	4.41	1.67	0.252	-0.8	5.61
1987-88	-0.22	4.09	0.04	-3.91	1.71	-3.07	3.74	3.28	-0.59	4.52	1.14	0.542	-1.2	4.45
1988-89	-0.76	0.27	-0.75	-1.82	1.26	-3.14	3.46	3.04	-0.54	4.35	1.21	-0.6	-0.9	4.12
1989-90	-0.51	0.1	0.19	-1.69	1.31	-3.06	3.65	3.07	-0.94	5.04	1.85	0.782	0.22	4.91
1990-91	0.08	-0.99	0.65	-2.45	1.6	-2.84	3.45	3.17	-1.22	4.65	0.85	-0.7	0.26	4.74
1991-92	-0.04	3.33	-0.06	-2.34	1.09	-3.16	3.16	2.95	-0.6	6.17	1.58	-0.88	-0.6	4.48
1992-93	-0.36	2.46	0.12	-2.9	1.16	-2.56	3.08	4.1	0.15	6.23	1.69	0.562	-0.5	5.16
1993-94	0.05	-1.52	0.14	-0.96	1.54	-1.37	2.94	4.06	0.2	6.52	1.43	-1.25	0.02	5.52
1994-95	-0.02	0.83	-0.51	-2.16	1.73	-1.47	2.68	3.88	0.63	6.35	1.99	-1.17	-1	5.21
1995-96	0.21	0.7	-2.62	-3.72	1.79	-0.98	2.85	3.75	1.54	6.31	1.35	-1.36	-2.2	4.56
1996-97	1.1	-1.5	1.7	-1.46	1.16	-4.08	2.85	3.77	0.15	6.1	1.42	-1.98	-1.5	5.91
1997-98	0.34	-0.01	-0.3	-4.01	1.97	0.11	2.63	4.35	0.12	4.09	1.54	0.676	1.33	3.03
1998-99	0.86	-0.57	1.81	-1.99	3.97	0.97	2.81	3.82	0.88	4.72	-1.2	0.259	-0.4	7.39
1999-00	0.62	0.02	0.13	-3.22	3.73	0.25	3.8	5.59	2.8	5.19	3.1	0.199	-1.8	3.99
2000-01	1.01	1.03	0.25	-1.29	2.24	-0.61	5.99	5.37	1.26	5.16	1.82	0.087	1.32	4.63
2001-02	0.66	0.68	0.27	1.31	0.12	0.34	7.7	5.75	2.58	4.95	1.46	-0.14	-0.5	4.28
2002-03	0.64	0.23	-0.76	-0.42	1.05	0.47	7.04	5.55	2.1	4.71	1.3	-0.69	2.28	4.56
2003-04	0.74	0.47	-0.65	-0.78	1.21	0.19	6.45	5.21	2.37	4.62	0.98	-0.87	0.1	4.52
2004-05	0.66	-0.57	-1.13	0.25	0.86	0.66	6.61	5.33	2.49	4.48	0.6	-0.48	-0.1	4.04
2005-06	0.51	-0.38	-0.93	-0.13	0.64	0.42	6.01	5.87	1.84	4.31	0.38	-1.22	1.69	3.92
2006-07	0.68	-0.91	-0.72	-1.01	1.65	-1.15	6.18	3.75	1.37	4.09	0.09	-1.09	-1.8	3.92
2007-08	0.78	-1.26	-2.31	1.24	-1.1	0.99	6.29	5.83	1.61	4.54	0.58	-0.83	-0.7	3.8
2008-09	1.34	-0.93	-0.75	1.13	-0.8	1.63	6.56	7.57	3.47	5.03	0.72	-0.39	-3.8	3.75
2009-10	1.82	-0.79	-1.08	-0.57	0.21	-0.34	5.28	7.08	2.47	4.78	1.32	-0.73	-1.3	3.81
2010-11	1.14	0.65	-0.88	0.15	2.7	-0.87	5.48	5.16	2.37	4.64	1.53	-0.31	4.12	3.93
Average: 1981-82 To 2010-11 (Total period)	**0.39**	**0.52**	**-0.28**	**-1.73**	**1.39**	**-1.18**	**4.62**	**4.35**	**0.83**	**4.93**	**1.29**	**-0.23**	**-0.40**	**4.58**
Average: 1981-82 To 1990-91 (Pre-reform period)	**-0.09**	**1.36**	**-0.02**	**-2.91**	**1.47**	**-2.49**	**4.23**	**3.18**	**-0.50**	**4.50**	**1.50**	**0.485**	**-0.70**	**4.70**

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Artha Beekshan, Volume 26, No 3, December 2017

Report of the 37th Annual Conference of Bangiya Arthaniti Parishad
(BENGAL ECONOMIC ASSOCIATION,BEA)

Inaugural Session

The 37th Annual Conference of Bangiya Arthaniti Parishad(BENGAL ECONOMIC ASSOCIATION, BEA) was held on 15–16 September 2017 at Prabhu Jagatbandhu College, Andul, Howrah. The theme of the Conference was 'Reforming the Indian Economy'. The Conference President was Professor Asis Kumar Banerjee, former Vice Chancellor, Calcutta University.

The Inaugural Session began with chanting of Sanskrit *slokas* and song of Rabindranath Tagore by Prof. Suman Chatterjee, Guest Lecturer, Bengali, Prabhu Jagatbandhu College. The dignitaries were invited to take chair on the dais and were felicitated with flower bouquet and honoured with gifts (books). In his welcome address, Dr. Subrata Kumar Ray, Principal, Prabhu Jagatbandhu College expressed his deep pleasure to host such a grand academic meet and offered warm welcome to Prof Pulin B. Nayak, former Director, Delhi School of Economics, Prof. Asis Kumar Banerjee, former Vice Chancellor, Calcutta University, Prof. Biswajit Chatterjee, President BEA, Prof.Swagata Sen, Pro-Vice Chancellor, Academic affairs , Calcutta University, Dr Ruma Bhattacharyya, Secretary BEA and Prof. Pabitra Sengupta, one of the former Secretaries and Vice-President of the Parishad and well-wisher of the college for gracing the occasion. He referred to the rich historical legacy of the college and highlighted the recent development activities of the college.

This was followed by lighting of the ceremonial lamp.

Prof. Biswajit Chatterjee, President BEA accorded a warm welcome to the dignitaries on the dais and scholars and students of Economics participating in the Conference. BEA is honoured to have Prof. Asis Kumar Banerjee, former Vice Chancellor, Calcutta University, as Conference President and Prof Pulin B. Nayak, former Director, Delhi School of Economics, delivering the A.K. Dasgupta Memorial Lecture this year. While speaking about BEA, he said that the Parishad, apart from providing a forum for academic discussions is also publishing its referred quarterly journal **Arthabeekshan** , and edited books. BEA aims to enthuse scholars in colleges and institutes of research and to promote excellence through academic discussions, seminars and publications. Distinguished academicians and scholars have contributed to the Parishad by their leadership as President, Secretaries and other office bearers, paper presenters and speakers in conferences organized by BEA and publishing articles in Arthabeekshan and other edited volumes. The Parishad this year has revived the Panchanan Chakraborty Memorial Award of Best Teacher in Economics and S.R. Sen Memorial Award of Best Book in Economics. Prof Chatterjee gave a brief preview of the programme. The theme of the Conference is 'Reforming the Indian Economy' and the sub themes of the three Technical

sessions were: 'Sustainability of Indian Agriculture - Constraints and Challenges', 'Economics of Health and Nutrition' and 'Money and Inflation - Theory and Empirics'.

Dr Swagata Sen, Pro-VC (Academic), Calcutta University, Guest-of-Honour, expressed his pleasure to accept invitation from Prabhu Jagatbandhu College. He hoped that the academic discussions from the conference will percolate to the students to make the conference truly successful. He referred to the debate on development between Jagdish Bhagwati and Amartya Sen. While speaking about our experience from reforms, he said that media, print and electronic, present a partial view of reforms; either criticizing or hailing reforms. However one should judge impartially and observe that India has made tremendous achievement in terms of GDP growth but malnourishment, hunger and child death still persist. Rich demographic dividend is accompanied by jobless growth in India. In the name of reforms some acts have been taken that have not benefitted the humanity. He ended offering greetings for the forthcoming Durga Puja.

The Souvenir commemorating the Conference and the Conference Volume of Arthabeekshan were released by the dignitaries.

Prof.Pabitra Sengupta, one of the former Secretaries and Vice-President and well-wisher of the college gifted 'Glimpses of Lost Leaders', a book written by him to all the dignitaries present. He recollected his long time close association with the luminaries of BEA, especially Dr S.N. Sen, Prof Dhires Bhattacharyya and Prof Alak Ghosh whose committed leadership glorified the Parishad. Prof. Sengupta humbly expressed his gratitude to them who have inspired him to be not only a good teacher but also a good human being.

Prof Ratan Khasnobis, former Professor, Calcutta University was supposed to deliver the S.N. Sen Memorial lecture. Unfortunately he could not be present due to illness, and so his paper titled 'Monetary Theory Revisited' was read out by Dr Ruma Bhattacharyya, Secretary BEA. (The paper is attached herewith).

Prof. Asis Kumar Banerjee, former Vice Chancellor, Calcutta University in his Presidential address titled 'Inclusive Growth, Economic Reforms and the Post-crisis Macroeconomic Slowdown in India' focused on the problem of deceleration in economic growth in India since 2011-12. He related the persistent nature of the growth deceleration in India to issues closely associated with inequality in general and to the share of labour in GDP in particular. He discussed the problems of studying the time pattern of inequality in India due to limitations of different measures of inequality. He therefore proposed to consider share of labour in GDP to formulate the distribution question. He cited the causes of falling share of labour in GDP in advanced countries as well as in India and explained the persistence of deceleration in investment and economic growth in India in terms of the observed trend in falling labour share in GDP. (The paper is attached herewith).

The inaugural session ended with vote of thanks by Dr Ruma Bhattacharyya, Secretary BEA and Dr Tapasree Banerjee, Local Organising Secretary. They expressed their gratitude to the sponsorers, namely ICSSR and NABARD, and Government of West Bengal and others, and thanked the authority and staff of Prabhu Jagatbandhu College and all the delegates for extending their support to organize the conference.

Dr Mou Roy, Joint Secretary of the Parishad(BEA) acted as Rapporteur in the inaugural session.

Professor AK Dasgupta Memorial Lecture 2017

Professor Pulin B Nayak of Delhi School of Economics delivered the A K Dasgupta memorial lecture on *A Reconsideration of Gandhi and the Economics of Austerity* in the post lunch session of 37th Annual Conference of Bengal Economic Association (BEA). The session was chaired by Professor Biswajit Chatterjee, President BEA.

Professor Nayak began with the life and works of Professor Dasgupta, focusing as an economic theoretician and put forward the argument that in contrast to the major thinkers preceding him in the pre independence era, Professor Dasgupta made theoretical contribution to the Indian economic thought towards its significant advancement. In an extremely lucid manner, Prof Nayak then went on to explain the characteristics of an economic theoretician in the purest sense of the term, and exemplified them with the salient features of the works of Professor Dasgupta and its strong rooting to the Indian socio-economic reality, however , also showing the context and environ of LSE that shaped the thought process of Professor Dasgupta. Professor Nayak enthralled the audience by his vivid portrayal of the journey of Professor Dasgupta, from an astute theoretician to more of an economic thinker, as he matured as an economist over time working in numerous capacities in various prestigious institutions. Professor Nayak explained how it was this transition which lured Professor Dasgupta towards Gandhian philosophy and economics. He then went on to examine the moral view that Gandhi undertook to view the material world and explained the salient feature of Gandhian economics. Professor Nayak then explained that Dasgupta, having a deep understanding of the Ricardo and Mill, related with Gandhian economics for a better understanding of the Stationary State, and in the process delivered the famous Shastri memorial lecture on Theory of Austerity.Professor Nayak observed that Professor Dasgupta in his mature years lamented that Indian policy makers, and the people at large were unlikely to embrace the Gandhian model of thinking due to lack of paving a path for its application. Professor Nayak concluded with the remark that although today economist are doing a great job, yet they are concentrating more on technical concerns, rather than focusing on the core issues of the economy.

Dr.Purba Chattopadhyay, Associate Editor of the journal “Artha Beekshan” acted as Rapporteur in this session

Sm. Giribala Karmakar Memorial Lecture'

The BEA had organized 'Sm. Giribala Karmakar Memorial Lecture' during the first day of its 37th Annual Conference organised by Prabhu Jagatbandhu College,Andul , Howrah, West Bengal. Prof. Pabitra Sengupta chaired the Session and it was co-chaired by Dr. Asim Kumar Karmakar. The Lecture was delivered by Prof. Sebak Kumar Jana, Head, Dept. of Economics,Vidyasagar University.

The chairman of this special lecture, in his well come address, highlighted about Sm. Giribala Karmakar and congratulated Dr Asim Karmakar for instituting this lecture in the memory of his mother . He considered that Prof. Jana as his student. Speaking of Prof. Sebak Kumar Jana, he said that he had great affection for him at personal level. Prof. Sengupta also stated that the subject chosen for the lecture was of great contemporary relevance.

Thanking the chairperson, Prof. Jana started the lecture. The topic of the lecture was "***Higher Education in West Bengal – An Overview***". Prof. Jana mainly focused on the present status of higher education in the West Bengal by delving deep into some important parameters in higher education and attempts to find out the major areas of concern in the state. However, he mentioned some remarkable information regarding expansion of higher education in West Bengal.

He described the various issues related to the topics as follows:

1) Diversification and disparities in higher education in West Bengal in terms of cast, gender, gross enrolment ratio, etc.

2) Regarding quality of higher education in West Bengal he mentioned NAAC assessment, research publication, higher education with employment and vocational education and skill development.

3) Addressing expenditure pattern of higher education in West Bengal he mentioned that public expenditures on education in India have increased remarkably in the post independent era. He also explained cost of higher education in West Bengal.

In his concluding remarks, the speaker said that quantitative figure alone did not reflect the true performance of the state. He also mentioned in order to get more prominent picture of the status of higher education in Wet Bengal "quality" issue should be addressed. Finally, he mentioned that the state of higher education in West Bengal is not satisfactory and emphasis should be given on modification of the courses show as to improved employment opportunities.

The Session was concluded with the remarks of the Session chair. Thanking the speaker for his in-depth discussion, Prof. Prabitra Sengupta briefly summarized the lecture delivered by Prof. Sebak Kumar Jana and emphasized the need to dwell upon the areas as

mentioned by Prof. Jana in his lecture.Dr Sudip Jana, Joint Secretary of the Parishad was the Rapporteur in this session.

Second Day of 37th Annual Conference of BEA

The second day of the Conference began with the felicitation of dignitaries, namely Prof Subiresh Bhattacharya, Chairman, West Bengal School Service Commission, Dr.Shyamalendu Chatterjee, Principal, Chittaranjan College, and Prof Kaushik Gupta, Department of Economics, Calcutta. All of them praised the BEA for its activities and urged it to undertake research studies on the effectiveness of policies of both the Central and State governments. Then three parallel sessions were held on the themes of the conference.

Theme 1: Sustainability of Indian Agriculture: Constraint and Challenges

This session was Chaired by Professor Jyotish Prakas Basu of West Bengal State University. The Rapporteur of the session was Dr.Debjani Mitra of Bijoykrishna Girls' College, Howrah.

In this session keynote paper " Improving Agricultural Performance and Enhancing the Farmers" was delivered by Prof Sankar Kumar Bhaumik of Central University of South Bihar.. He mentioned that agriculture in India continued to remain as an important sector of the economy in as much as it continues to provide employment to more than one half of the workers. In this paper, the speaker seeks to identify the major reasons that have led the sector into a crisis. The policies for revival of the sector are also reviewed in this paper.

Besides the keynote paper, seven more papers were presented in this session. Debjani Mitra and Sudipta Sarkar in their paper " Glimpses on India Agriculture and its sustainability: An Emperical Study" concentrated on Indian agriculture and its sustainability during the post reform period by mentioning pattern and trend of agricultural production, crop diversification and sustainable farming. The paper entitled " Sustainability of Indian Agriculture" was presented by Mahuamita Deb. She told about agricultural education and sustainability in agriculture. Sudip Jana in his paper " Sustainable Intensification for Agricultural Sector" has discussed about increasing yield, chiefly arable crops, resource scarcity and environmental challenges and sustainable intensification. " Sustainability of Indian Agriculture, Constraint & Challenges " is presented by B. Basu in the context of " Roti Kapada and Makan" . He highlighted on the position and importance of agricultural industries. Sujatra Bhattacharyya in his paper highlighted on introduction of information technology for sustainability in Indian agriculture. The sustainability of Indian Agriculture in the Neo liberal regime with a special emphasis on the state of West Bengal has been presented by Sumana Mukherjee in her paper " Sustainability of Indian Agriculture under the New Economic Policy Regime:A case study of West Bengal." Impact of purchasing crop insurance on pesticide use was analysed by Imdadul Islam Halder in their paper" Does Insurance affect Pesticide use? .Besides many

papers were briefly presented in the session and there was good discussion on the papers presented.

Theme II : Economics of Health and Nutrition

This Session was chaired by Prof. Arpita Ghosh of Jadavpur University and was Co-chaired Dr. Biswajit Guha, a former President of the Parishad. Sm. Sakhi Roy, Research Scholar,JNU, acted as the Rapporteur.

The Keynote Speaker for this session was by Prof. Sushil Kumar Halder, Jadavpur University. He spoke on "Demographic Dividend, Health Outcomes and Economic Growth in India:A Critical Analysis."

Prof Halder highlighted how the health state of the population at the aggregate level (the share of healthy people in the population) determines the extent to which potential labor services embodied in the population can be used effectively. Moreover, knowledge accumulation requires the spending of 'healthy hours'. Hence, the state of health in a country affects its economic growth through various channels. If health improves, the country can produce more output with any given combination of skills, physical capital and technological knowledge.

One way to think about this effect is to treat health as another component of human capital incorporated in formulating the endogenous growth models (Thomas et al., 1997, Bloom et al., 2001). The effects of human capital variables (namely, health and education) imply that the investment rate tends to increase as levels of education and socioeconomic status of health rise. Longer life expectancy encourages larger investments in human capital, which in turn accelerates the per capita income. The explanation of larger investments on human capital due to longer life expectancy is offered by Stark (1995) in terms of intergenerational transfer of assets. The provision of public resources for better health in a developing country can assist the poor to release resources for other investments, such as in education, as a means to escape poverty. The long-term relationship between income and health is examined by Arora (1999) considering the developed countries in the world and has observed the hypotheses that health of the population has influenced economic growth and that it should be an integral component of the productivity of economies and supporting the endogenous growth models.

India has been experiencing a rapid decline of fertility that results rising share of working population; it is projected that India will witness the demographic dividend after 2025 but the disaggregate picture is different (Registrar General, Govt. of India 2006).

There exist **two** views whether India is capable to enjoy the benefit of demographic dividend or it will create a burden. The recent Latin American experience provides that the age transition

does not lead to economic growth (Bloom et al 2003). The pessimists like Mitra and Nagarajan (2005), Chandrasekhar et al (2006) and Bhattacharya and Haldar (2015) have argued that demographic changes are not sufficient to provide an upward push to the rate of economic growth; this is because India has been facing a major deficit in the area of health and education sector which is assumed to be necessary for human capital accumulation. India has been sharing roughly 17.5% of total world's population, but she has to share about 20.6% of world's poor (Donnan 2014). Moreover, there is wide regional variation in respect of health and educational outcomes among the major states (Kurian 2000, Bhattacharya and Haldar 2013).

As the fertility declines the subsequent child cohorts' starts shrinking which ultimately gives rise to the 'Demographic Dividend'.Hence, in this context Prof Halder wanted to find:How does demographic dividend (along with health outcomes) affect economic growth?

Using the United Nations' Population Division, World Population Prospects the **Trends in the Dependency Ratio in India, it was shown** that all most all the states have been witnessing an increase in the share (percentage) of working age population but the rate of increase across states over the decades vary to a great extent, especially during 2001-2011. This is because socioeconomically backward states like Uttar Pradesh (UP), Rajasthan, Madhya Pradesh, and Bihar have experienced a high but slow fertility decline during 2001-2011 compared to earlier decades.

Demographic Gift requires: Declining Fertility along with the changing age structure of Population in favor of the share of Working Age Cohort [Bloom and Williamson ;1998 ,Bloom and Canning ; 2004. The age sex composition of population in Uttar Pradesh is found to be more or less stable between 2001and 2026 whereas a dramatic change is noticed in case of West Bengal. Such diversity is caused by the change in fertility of the two states, Uttar Pradesh and West Bengal. West Bengal has been experiencing a rapid decline in fertility as a result the share of working age population is found to higher in 2026; but till date the fertility in Uttar Pradesh is found to be high and it starts declining at a very slow pace during the last decade 2001-2011.

Then he discussed about some Emerging Policy Issues in India pertaining toReproductive and Child Health.Prof. Halder rightly pointed out that one can conjecture that poor health outcomes may be due to poor public expenditure on health and education. One can simply examine this by way of rank correlation coefficient between human capital investment (i.e., PCEE and PCHE) and human development outcomes. Without examining the direction of causality, a simple rank correlation between RHDI, PCHE, PCEE, PCNSDP of 15 major states for five time points were shown below. Rank Correlation between RHDI, PCNSDP, PCHE and PCEE: 1992-93.

He then pointed out the Major Constraint of Effective Human Capital Formation. In this regard it is important to understand that transformation of demographic dividend to economic dividend largely depends on quality of human resources and its proper utilization. Wide spread unemployment, incidence of acute malnutrition of children, poor reproductive health of the mothers, illiteracy, poor enrolment in secondary school etc. are the real barriers to enjoy economic dividend from demographic dividend.

All most all the states have experienced a decline of chronic malnutrition during 1992-92 to 2005-06 but the pace of decline is extremely low. Data on malnutrition for 2015-16 (NFHS-4) are not available for all the major states, it was available only for 9 major states. Moreover, malnutrition for 2015-16 cannot be compared with earlier surveys because of two reasons: earlier surveys consider children aged less than 3 years and children suffer in each of three categories of malnutrition jointly. Bihar and Madhya Pradesh, two major BIMARU states in India in near future will contribute a major share of working population but till date more than 40 percent of the children under age 5 years are found to be stunted and under-weight. The proportion of malnourished children is disproportionately high among the BIMARU states compared to other states; now if majority of the children do suffer from malnutrition, their future effective human capital formation will be jeopardized. Lots of studies support the view that malnutrition of children is basically caused by poor reproductive health of the mothers, illiteracy and poverty (Smith and Haddad 1999, Som, Pal and Bharati 2007). Healthy and well-nourished children perform better in school and better performance in school positively affects their future income. Proper childhood development depends to a large extent on adequate prenatal care for the mother so that child births can take place under adequate medical supervision, and on the suitable and proper preventive and curative medical attention. Current reproductive health status of the mothers significantly affects health status of new born babies.

Prof Halder concluded that given the poor reproductive and child health status across the 15 major states, especially among the BIMARU states, it is difficult to reap the benefit of economic return from demographic dividend. BIMARU states along with Assam which are still belonging to the second stage of demographic transition are alone expected to contribute to more than sixty percent to the overall increase in the share of working age population of India over twenty five years from 2001 to 2026. But, the health and educational status of these states are found to be extremely poor; many reasons are there but none can deny the extremely low per capita health and education expenditure. India has always had a disproportionately small education and health budget compared to many developing countries in the world. It has serious consequences among the poor living in poorer states. Moreover, various development programmes like Self-Help Groups(SHGs), ICDS, Janani Surakshya Yojona(JSY), Sarba Siksha Abhijan (Education for all), Health for All, NREGA have already

been launched but their performances are not satisfactory; in some cases many state governments fail to run all these programmes because of lack of continuous flow of funds.

Therefore, India has enormous potential to extract economic returns from demographic dividend if some corrective measures be undertaken immediately at the policy level especially in health sector.

The Theme paper for this session was delivered by Prof Arijita Dutta, Professor, Calcutta University. Her topic of discussion was "Economics of Health & Nutrition: some theoretical and empirical issues".

Professor Dutta initiated her talk on why the study of health economics is crucial and important and what actually motivated her to take up study in this area. Though economics of health and nutrition is a budding area of study now but initially these fields were considered to be discussed and analyzed by medical and public health professionals only. The economists have gradually made their involvement in these areas guiding the policy interventions to the social planner and impact evaluation of these policies.

She highlighted how the principles of positive economics often fail in capturing the basic issues of health and health care, primarily because many of the assumptions behind maximization of utility function gets violated once we consider health and health care into the utility functions. Also, unlike other goods and services, demand for health care is derived in nature because it increases the utility through improvement in health status.

Additionally, due to presence of strong information asymmetry and externality in healthcare market, the demand for health care is often induced by its suppliers and hence leads to misallocation of resources.Economics of nutrition, on the other hand, strongly depends not only on intake of perceived nutritious foods, but also the capability of the person to assimilate them.

In spite of a large scale public policy of Integrated Child Development Scheme (ICDS) in operation in India since 1970s, the country is still home to the highest number of malnourished children. It is a big puzzle to the government why this scheme has become such a big failure. Economic theory and impact evaluation technique can identify the knots in improving the child nutrition in India.

There were 14 paper presentations in this session. Research Scholars and Faculty members of Reputed Institutions shared their research. The overwhelming number of papers in this session not only proves the significance of this area but also the amount of research being conducted in this area by researchers.

"Health Care Expenditure and Economic Growth Nexus- A Panel Data Analysis of Some

Developing Countries"was presented bySovik Mukherjee of Shri Shikshayatan College.

The Presenter highlighted that how one of the essential issues in health systems across the world is that what factors control the resources a country allocates to medical care. The share of health expenditures of GDP in the developing countries is often less as compared to the developed countries. Consequently, as the country progresses through the various stages of development, health expenditures increase too. The purpose of the paper was to take a closer look at the liaison between the two focus variables viz. growth and public healthcare expenditure. Mushkin'sdeveloped the "health-led growth" hypothesis and Bloom & Canning's "health as productivity" concept. Hence the paper wanted to investigate whether the two way causality between health & growth justified in the context of developing countries? The Chair added that additional controls were required as GDP does not only depend on health expenditure alone.

"A systematic Review of Health Insurance in India"presented by Sakhi Roy, Research Scholar, JNU and Dr.Subrata Kumar Ray, Principal, PrabhuJagatbandhu College, Howrah.

The presenter initiated the talk on how Health insurance is attracting more and more attention in India as a means for improving health care utilization and protecting households against impoverishment from out-of-pocket expenditures.Various types of health insurance are available. National or social health insurance (SHI) is based on individuals' manda-tory enrolment. Several low- and middle-income countries, including the Philippines, Thailand and Viet Nam, are estab-lishing SHI. Voluntary insurance mechanisms include private health insurance (PHI), which is implemented on a large scale in countries like Brazil, Chile, Namibia and South Africa, and community-based health insurance (CBHI), now available in countries like the Democratic Republic of the Congo, Ghana, Rwanda and Senegal.

The various types of health insurance have different impacts on the populations they serve. For ex-ample, PHI is said to mainly serve the affluent segments of a population, but CBHI is often put forward as a health financing mechanism that can especially benefit the poor. However, the impact of health insurance in low-and-middle-income countries has unfortunately been documented only partially.

The presenter concluded that there is an urgent need to document Indian experiences in health insurance so that different financing options are developed for different target groups especially private health insurance impact. CBHI and SHI hold strong potential to improve financial protection and enhance utilization among their enrolled populations, and they can also foster social inclusion.

"An impact of socio-economic status on health: A case study on few primary schools in the district of Purba Burdwan, West Bengal."Presented by Sunil Kumar Baskey, Assistant

Professor, Department of Education, Rabindra Bharati University; Dr. Pankaj Kumar Paul, Assistant Professor & Head, Dept of Education. Gourav Guin Memorial College, Vidyasagar University and Srikanta Nandi, Assistant Professor & Head, Dept of Education, Shyampur Sidwesari Mahavidyalaya, Calcutta University.

The presenters highlighted that since India is an over populated country hence everyone does not get the chance of continuing their education through formal education system due to paucity of socio-economic status and ill-health. Their paper was thus an attempt to examine the impact of socio-economic status (SES) on health and education with special reference to few primary schools in PurbaBurdwandistrct in West Bengal, India.

The study was primarily analytical in nature. A structured questionnaire had been used to collect primary data encompassing 80 teachers and 180 students in few primary schools of PurbaBurdwan district in West Bengal.

Chi-square test was used to examine the association between socio-economic status and its impact on health and education among the primary students. Moreover, student's t-test was used to examine the significant differences in opinion among the respondents towards the impact of socio-economic status on health and education of the primary students with respect to their socio-economic status (APL/BPL), locality(rural/urban), gender (male/female) and social groups (reserved/unreserved).

The study found significant association between socio-economic status and its impact on health and education among the primary students. Significant attitudinal differences occur among the students belonging in different socio-economic status, locality, gender and social groups towards the impact of socio-economic status on health and education of primary level students.Thus, they concluded that their study revealed that socio-economic status has a positive impact on health and thereby, maintaining the access of education in near future.

"Education and Quality of Life in Perspective of Economic Reforms in India: A Case Study with reference to few Households of Burdwan District in West Bengal."presented byDr. Pankaj Kumar Paul, Srikanta Nandi and Sunil Kumar Baskey.

The Presenter tried to analyze the impact of education on the quality of life of the members of the households in perspective of economic reforms in India in Burdwan district of West Bengal. The study was empirical in nature covering55 households. A self-structured questionnaire was used for collection of data from one male and one female member of each household. Multi-stage purposive sampling method was used for collection of primary data.

A non-parametric Chi-square test was used in order to examine the association between education and quality of life of the members of the households. Student's t -test was applied to examine the differences in attitude towards the awareness among the households with

respect to economic status (i.e. APL and BPL), social status (i.e., General and Reserved category).Apart from this, ANOVA was used to examine the difference in attitude among the respondents having in different educational status (i.e., educated, under educated and uneducated). Again, multiple regression analysis was applied to examine the nature and dependency of a set of selected indicators on better quality of life (QOL) of the households.

The major findings of their study were:

i) There exists a strong association between education and Quality of Life of the households,

ii) Difference in attitude among the respondents towards the impact of education on Quality of Life,

iii) Quality of Life varied over the different socio-economic indicators of life apart from the level of education of the households.

"Inequality in Child Malnutrition"presented byDr. Smritikana Ghosh, Assistant Professor, Department of Economics, Scottish Chruch College, Kolkata.

The Presenter rightly pointed out that malnutrition, especially child malnutrition is one of the major concerns of India like any other developing country. In India, there is a significant percentage of malnourished children. However, the extent of malnutrition is not same everywhere across the country. To eliminate this problem from the society, the Government has to know the degree of malnutrition in different regions of the country.

Hence, the main objectives of her paper was to divide the country in some regions based on the level of child malnutrition (in terms of stunting), find the depth of child malnutrition in those regions and to find group level inequality across the regions and across different socio economic factors. To do that, techniques of malnutrition gap index, Group Analogue Gini Coefficient etc. are used.

The analysis shows that highest stunted region is highest not only in terms of number of stunting children but also in terms of depth of the stunting. On the other hand, among different socio economic factors, place of residence is a significant factor showing that rural children are more prone to be stunted than their urban counterpart.

"Maternal and Child Health in India in the Post-Reform period." presented byMou Roy, Associate Professor in Economics, Lady Brabourne College.

The presenter highlighted how maternal and child health play pivotal role in shaping the health status of a country. Mother's health has an important bearing on child's health. A longer and healthier life of woman gifts the nation a healthy and productive work force. Thus maternal and child health attainment at microlevel are crucial for achieving a decent and

respectable level of human development at the macro level. Although right to health is not a constitutional right in India, improvement of maternal health was assigned top priority in the country since inception of the planning era.

The National Family Planning Programme adopted in 1952, which later in 1977 came to be known as Family Welfare Programme focused on delivering adequate health care to women, specially pregnant women, their newborn and children. The Government of India in its endeavor to ensure accessible, affordable and reliable health services for all, especially poor and vulnerable, has introduced several schemes and programmes over the years, notable among them being Reproductive &Child Health Programme (RCH) in 1996 and Integrated Child Development Scheme (ICDS), in2001. Realising the importance of synergy and convergence between different health, nutrition and family welfare programmes as well as disease control measures, the National Rural Health Mission (NRHM) launched in April, 2005 integrated all erstwhile nationally funded programmes including RCH. Janani Suraksha Yojana (JSY), which is an intervention in the purview of National Rural Health Mission (NHRM, April 2005, attached importance on safe motherhood programmes including institutional deliveries in rural and BPL households.

The presenter assessed the state of maternal and child health in India in the post reform period in terms of both outcome indicators and process indicators. The outcome indicators chosen were MMR, IMR and U5MR. The process indicators include the maternal and child health care services like coverage of antenatal care, institutional delivery and immmunisation.

"Pattern and Effect of Child Nutritional Indicators on Child Survival Status in India" presented by BasudhaMukhopadhyay, Research Scholar, Jadavpur University & Assistant Professor, Department of Commerce, J D Birla Institute.

The Presenter drew our attention at the noticeable inconsistency of income growth and prevalence of undernutrition among children in India. There are evidences that suggest that there is varied magnitude of the existence child undernutrition in different states of India. Again the long cherished goal of reducing the infant mortality rate has not yet reached its target. Hence in this context her paper was an attempt to examine the pattern and influence of child nutritional status on infant mortality and under-five mortality across India.

She investigated the pattern and effect of child nutritional indicators using Unit- level data fromNFHS-1, NFHS-2 and NFHS-3 and factsheet data from NFHS-4 (2015-16) for all the states in India. The dependent variables were infant mortality and under five mortality rates. The independent variables are the child nutritional status. Bar graphs were used to depict the pattern of child nutrition and child survival status in India. Further, Normality test was performed to determine whether the dataset is distributed and thereafter Correlation to quantify the strength of the linear relationship between the variables.

The result showed that the pattern of child nutritional indicators and child survival status varies across states and in all the four rounds of NFHS. It is observed that the data follows a normal distribution and there is a significant association between stunting and underweight with child survival status. The result also showed that all the nutritional status do not affect the child survival status equally in all the rounds of NFHS.

Thus in spite of the declining trend of infant mortality rate and childhood nutritional status, there is still a need for developing a strong information, education and communication programme with respect to child survival and nutritional status to achieve the Sustainable Development goal of ending all forms of malnutrition by 2030.

"Analysis of Health Condition of Students with the help of Body Mass Index: A Case Study of Prabhu Jagatbandhu College." presented by Dr. Sarada Mandal, Associate Professor in Geography, Prabhu Jagatbandhu College.

The Presenter rightly pointed out that India faces the burgeoning twin problems of underweight and obesity.

Hence her paper was an attempt to analyze the health condition regarding underweight and over weight of the students of PrabhuJagatbandhu College. A cross sectional observational study was carried out on a sample of 55 colleges students. The data regarding height and weight was obtained by anthropometric measurements recorded by medical staff of Sankrail Block Hospital. The BMI calculated was used to categorize the BMI pattern of individuals according to WHO criteria for Asian Indians. A perception survey was conducted among the students and the physicians to identify the basic reasons behind the findings related to BMI Pattern.

In trying to analyze the results the presenter pointed out how the place of study holds a special significance. Andul, the place of the college is one of the rapidly developing towns in the Block Sankrail under the Sadar Subdivision in District of Howrah, West Bengal. It is a hub of the commercial and industrial activity, but the adjacent areas are rural in nature. In the locality of the college people are engaged mainly in tertiary occupation. Both in the rural and urban area the percentage of people of Scheduled Caste and Other Backward Classes are noteworthy. So students of this college came from a varied socio-cultural and economic background. This varied socio-economic base has been reflected in BMI index. Underweight among the girls is related with the general negligence to female members in the families of lower socio-economic levels and overweight among the girls is related to absence of exercise and sports facilities.

The present study validated the current view that underweight and overweight continue to thrive concomitantly in both urban and rural India among youngsters of college-going age

group and Prabhu Jagatbandhu College is no exception.

The Chair pointed out that socio-economic factors should have been included as part of the study, where surveyed students background characteristics were also included. It could have strengthened the study and helped in explaining the probable reasons for the nutritional difference among the students.

"Malnutrition in West Bengal" presented bySakhi Roy, Research Scholar, JNU and Subrata Kumar Ray,Principal, PrabhuJagatbandhu College, Howrah.

The presenters highlighted that under nutrition is the result of many inter-related causes which when identified correctly helps in designing policies effectively. Nearly half of all deaths in children under 5 are attributable to undernutrition(UNICEF).This translates into the unnecessary loss of about 3 million young lives a year. Undernutrition puts children at greater risk of dying from common infections, increases the frequency and severity of such infections, and contributes to delayed recovery. The UN estimates that 2.1 million Indian children die before reaching the age of 5 every year – four every minute - mostly from preventable illnesses such as diarrhea, typhoid, malaria, measles and pneumonia. Every day, 1,000 Indian children die because of diarrhea alone.Over 50 % children under 5 years of age are anemic in West Bengal, as per the latest National Family Health Survey (NFHS-4 for 2015-16) data.

In West Bengal, though the number of children under 5 years of age suffering from anemia decreased by seven per cent points over the last decade (from 61 per cent in 2005-06 to 54.2 per cent in 2015-16), one in every two children is still anemic.

It describes three levels of causality: immediate, underlying and basic. The immediate cause of undernutrition is due to an imbalance between the amount of nutrients absorbed by the body and the amount of nutrients required by the body as a consequence of too little food intake or infection. The underlying causes of undernutrition can be grouped under the three broad categories of food insecurity, inadequate care and poor public health. Political, legal and cultural factors may defeat the best efforts of households to attain good nutrition and these are described as basic causes of undernutrition. Using this framework they intended to understand the causes of under nutrition in West Bengal, carefully identifying the contributions of the three causes in the ultimate undernutrition game. Oaxaca Blinder decomposition helped them in calculating the contributions. Results highlight that a multi-sectoral approach to nutrition is the need of the hour. Nutrition-specific and Nutrition-sensitive interventions are required to accelerate progress.

"Impact of Mid Day Meal Programme: A Micro Level Study in Howrah District, West Bengal ." presented by Kakoli Banerjee, Sujata Bhowmick(Ganguly) and Subrata Kumar

Ray, Prabhu Jagatbandhu College, Andul-Mouri, Howrah.

The presenter initiated the talk by rightly pointing out that the Government of India has initiated several programmes relating to Nutritional and Food Security of the poverty stricken people.Mid Day Meal (MDM) programme being one of them was launched in India to enhance enrolment and attendance in primary schools. Simultaneously it also focused on the improvement of Food Security and Nutritional status of the students. The MDM programme is important in this regard.

Thus, her paper was an attempt to highlight the impact of thisprogramme at Gram Panchayat level of Howrah District, West Bengal as well to review the existing literature.

A brief review of existing literature on Mid Day meal in India was also presented in this context:

"Effects of Lifestyle Change on Sustainability for "Reforming the Indian Economy" presented by Dr. Chameli Mandal (Pandit), Assistant Professor, Sarsuna College, Kolkata and Dr. Pintu Kumar MajiPost-Doctoral Felllow, Indian Council of Social Science Research (ICSSR), New Delhi.

The presenter initiated the presentation by highlighting that in the day of consumerization when economy is running behind high economic growth and high consumption, we the researchers must formulate plans to achieve sustainable society. From 19th century it has become our slogan that economy must develop following a sustainable path- a path of sustainable society and sustainable environment which are very much interdependent to each other. The linking parameter between the two interrelated concepts of sustainability is the sustainable lifestyle. The effects of change in lifestyle have become a matter of concern for sustainability. In the era of Globalization, fast flow of goods and information forced young generation to live an attractive lifestyle. The study mainly tries to assess their behavior towards sustainability.

The major objectives of the study were to assess the behavior of lifestyle change and sustainability of the secondary school students and the correlation between the two.

The sample comprised of 150 students, both boys & girls ranging in age from 15-17 years andstudying from various secondary institutions under WBBSE in West Bengal. In their study they have considered stratified purposive sampling due to short time period. Two validated questionnairevetted by experts and researchers in measurement and research was used as an instrument fordata collection and analyzed by employing quantitative research approach.

In the study they have considered two categories of lifestyle namely positive lifestyle and negative lifestyle. The study reveals that a different category of lifestyle has some effects on sustainability.Also it has been found that a relationship exists between lifestyle change and sustainability.

The presenters concluded that understanding the effects of lifestyle change on sustainability through these determinants has become a challenging issue now days. Students are the future of world so if they are in the habitof positive lifestyle then it would not take much time to turn our society into a sustainable society and this indirectly reform the economy. Hence their study supported the theoretical under pinning of theimportance of the effects of lifestyle change on sustainability for 'reforming the Indian economy'.

"Status of Health and Nutrition in Falta Block under Diamond Harbour Sub-division of South 24 Parganas District." presented by Prosenjit Kayal, Post Graduate Student and Dr. Anandita Dawn, Post Graduate Department of Geography, Prabhu Jagatbandhu College, Howrah.

The presentation highlighted how health and nutrition especially of women and children are important parameter for assessing the level of social development of any area. In this regard they tried to throw some light on the nutritional status of women and children below six years of age in the Falta block of South 24 Parganas district of West Bengal. Using secondary data from the Block Office, an exact picture of the health and nutrition of the area was studied.

The major findings were that anemia and thalassemia was common among women and children in this area. In spite of having many public health care centers in the area, there were many problems identified. Unavailability of doctors, nurses, medicines, excessive flow of patients, lack of referral transport etc. contributed to poor condition of health in the area. they concluded that despite several initiatives undertaken by the local and State Government in the area, the situation has improved overtime but at a very slow pace.

"Development Perspective for Eastern States of India: The Health Sector." presented by Mukul Saha, Associate Professor, Prabhu Jagatbandhu College, Andul-Mouri, Howrah.

The Presenter addressed the development perspective of the eastern states of India, namely, West Bengal, Bihar, Odisha and Jharkhand, in the context of health. His paper studied the health scenario of these states with reference to the percentage of the aggregate as well as per capita expenditure on health, together with a comparative study with reference to all India. Further the paper also highlighted the health expenditure of each of these eastern states as percentage of all India health expenditure. Moreover, the paper highlighted the current status of the health scenario by taking into consideration certain health parameters

like medical insurance, fertility rate, infant mortality rate, maternal and child health, child immunization and prevalence of anemia.

He further compared the performance of the states with the all India performance.

"An Economic Analysis of Health-care Expenditure in India" presented byDr. Debarati Das, Guest Faculty, Department of Law, University of Calcutta and Dr. Jayanta Sen, Assistant Professor, Department of Economics, West Bengal State University.

The presenter highlighted how the quality of human resourcesi.ea productive workforce can lead to economic growth. But being able to finance the healthcare is the important issue. Financing healthcare expenditure is the ability of an individual to access available medical facilities. Rich does no face great difficulty to afford healthcare expenditure. Poor find it difficult to afford health expenditure which drags them into deeper poverty. Low healthcare expenses, insufficient delivery in medical facilities leads to poor health status.

India is facing continuing challenge in delivery of healthcare needs of the under-privileged groups.Globalization – new, improved and expensive medical technology – growth of private hospitals – quality medical services unaffordable to the poor. Selvaraj (2010) and Sengupta (2008) highlighted the shortcomings to drug price control and remarked on the inequity in distribution of affordable quality drugs.

Literature also highlights the importance ofunequal distribution in healthcare funding(Sanyal, 1996; Bilger, 2008; Wagstaff, 2010). Unequal distribution in healthcare funding in India (Garg, 1998; Doorslaer and Wagstaff, 1998) has also been studied.

Thus, the objective of the Studywas toexamine the extent of inequality in healthcare expenditure in rural and urban parts of India and its major constituent states. Additionally,to seek the role of factors contributing to the healthcare expenditure inequality in different parts of the nation

The study had identified the regions or spaces where the individuals are more deprived relative to the others. Both rural and urban regions experienced rising trend in inequality in healthcare expenditure. More severity of the healthcare expenditure inequality is observed in rural regions of almost all the states compared to the urban parts. The contribution of both between-state and between-sector components to overall healthcare expenditure inequality has increased.

The Presenter concluded that special focus must be given by the government for financing the healthcare needs of the disadvantaged groups. Budget allocation of funds should be made efficiently, so that it reaches the hands of the needful ones. Other measures like improving primary healthcare centers, developing community healthcare services, special healthcare

insurance schemes for poorer sections, social security for informal sector workers, should be adopted by the government to help the lower income sections live a better and health life, that in turn boosts up the economic growth of the nation.

Technical Session – III: Money and Inflation: Theory and Empirics

This session was chaired by Professor Kaushik Gupta, Department of Economics, Calcutta University, Kolkata and Co-chaired by Professor Debesh Mukherjee, Former Teacher In-Charge, St. Paul's College, Calcutta. Dr.Niladri De, Joint Secretary of BEA was the Rapporteur. In this session the theme paper was presented by Dr. Kumarjit Mondal, Department of Economics, Calcutta University and he presented his paper on the topic 'Monetary Policy Rules in a Changing World'. First Dr. Mondal gave an introduction and he mentioned that monetary policy basically rulling the game. According to him three monetary policy rules are widely discussed in academic literature and these are-

a) Friedman Rule

b) Taylor Rule

c) McCallum Feedback Rule

After mentioning the three rules he raised a question that what is good monetary policy? To answer this question he mentioned two policies- i) Policy with commitment and ii) Policy without commitment. To describe the policy with commitment he mentioned the problem of dynamic time inconsistency of Barro-Gordon. He told that whether this policy is a good policy for Central Bank and whether it is an optimization policy for the Central Bank even if Central Bank seeks to maximize social welfare, discretion on the part of Central Bank will lead to suboptimal outcomes. He then mentioned the policy with commitment focusing on three points-

a) Management of expectations as economic decisions are forward looking.

b) Nature of commitment

c) Objective of the policy making

To discuss the problems he mentioned two problem areas such as Empirical problems and Theoretical problems. He said that agents' behaviours are forward looking and he also mentioned that according to the theoretical literature Policy without commitment is bad and Policy with commitment is good. He also focused on the point that Central Bank should decide what should be the attitude of Central Bank towards different choice variables, whether it will be inflation objective or output objective. In India to initiate the policy the Central Bank facing some problems and it is problematic to initiate the policy.

He then focused on the objective of the policy. He said that Central Bank should have an objective function. He took a model where the actual output is denoted as Y_t and potential output is described as Y_t^*, actual inflation is mentioned as $ð_t$ and earlier inflation as ð*. The function is a weighted function consisting of output gap and inflation gap. The weights chosen by the monetary authority reflects its predilection to Central Bank. He then started discussion on the three rules initially focusing on the Friedman's Rule. He said that Friedman would accept the social loss function with the highest weight on price stability and also mentioned that Central Bank is putting higher weightage for inflation management. To describe the rule he raised some important points such as-

a) In the long run variables tended to a natural rate that is independent of monetary policy

b) Monetary authority should avoid costly disturbances associated with

c) Monetary policy affected inflation with a lag-current inflation therefore is unsuitable as a target

d) Targetting expected future inflation would require too much reliance by policy makers on their estimates of structural relationships linking monetary policy actions and inflation.

e) K-percent Rule – The rule if could be applied by the Bank of England Great Depression of 1929 could have been avoided.

f) The oil price hike by OPEC in 1973 dealt a great blow to this rule.

To extend the discussion Dr. Mondal focused on the Great Moderation where he basically pointed on two things- i) Macroeconomic stability in terms of low output volatility in the post 1980s. and ii) Reasons for low inflation. He mentioned three reasons to illustrate the reasons for low inflation and these are-

a) Higher productivity and better inventory management.

b) Good Luck and

c) Good Monetary Policy

To describe the second rule i.e. the Taylor Rule he took a model where Taylor observed i_t as a nominal interest rate and i_t is the targeted FEDFUND rate. In the model $ð_t$ is taken as an inflation rate, Y_t is taken as the log of real GDP and $\overline{Y}_t$ is log of potential output. Dr. Mondal said that Taylor Rule is basically an Interest rate policy and he also mentioned that according to Surgent and Wallace interest rate rule is undesirable. He also focused on future expected

inflation that could matter and he said that India's most problematic area is the representative policy. He mentioned that strict principle of Taylor Rule was not followed post 2003.

Lastly he discussed on the McCullum Feedback rule very briefly. He said that this rule is post 1990 rule where the Base money is considered to describe the model and nominal GDP was also considered for further illustration. Due to time constraint Dr. Mondal then ended his presentation which was followed by question raised from the audience side and he answered all the questions very nicely.

After the theme paper presentation, paper contributors in this session started their paper presentation. In this session only two paper presenters presented their papers. Prof. Debarati Das of Raja Peary Mohan College, Uttarpara presented her paper on 'Non-Tax Revenue in Gram Panchayats in West Bengal'. She said that panchayats has to undergo a drastic change and she added that Panchayati Raj is required and to implement it rural people involvement is required. She also discussed on different sources of non-tax revenue and mentioned the importance of non-tax revenue and showed the methodology to increase the non-tax revenue. She mentioned some important goals, such as-

a) To assess the sources of non-tax revenues of West Bengal panchayats.

b) To make the panchayats self regulatory and self sustaining autonomous units.

c) To make the panchayats capable of resource mobilization.

d) To realize the goals of 73rd constitutional amendment which is democratic decentralization.

e) To visualize the panchayats not merely as agents but as effective means of democratic decentralization by ensuring their financial autonomy.

Second paper was presented by Dr. Amit Majumder of Bijoy Krishna Girls' College Howrah. It was a joint paper with Dr. Ruma Bhattacharya and the title of the paper was 'An Introspective Study on the Governance Practices of Major Microfinance Institutions (MFIs) in India'. Dr. Majumder started his presentation with a brief introduction and then to discuss about the good governance he mentioned the Cadbury Committee Report, 1992 and OECD Report of 1999. He also talked about the rudimentary thoughts on governance of MFIs and mentioned social and financial objectives. He told the objective of the study and he mentioned that 50 MFIs were chosen to illustrate the paper. They actually had chosen 50 MFIs to study the governance practices of the major MFIs in India and took some important parameters to fulfill the objective. The methodology of their study was based on governance practices in India and they took the responses from the competent authority. He mentioned Malegam Committee Report of 2011 and RBI Fair Practices Code etc. In the empirical findings he

mentioned origin based classification of major MFIs and also told the success story of Karnataka and Andhra Pradesh. He also told the legal status of surveyed MFIs in their study. Ho considered the Lending Model where he mentioned India's MFIs generally prefer to lend either through SHGs Model or through Joint Liability Group (JLG) Model. According to the authors, MFIs prefer the JLG Model. He then discussed the composition of Board where they mentioned MFIs are dominated by the promoters group and in case of MFIs the board plays a pivotal role and talked about the nominee directors and independent directors. He said that the issue of separation of post of Chairman and CEO is considered to be a significant mechanism to disturb concentration of power to single authority. He also mentioned that the percentage figure of separation of Chairman and CEO is 66% and not separated 34%. To discuss the Board Committee he mentioned Audit Committee, Remuneration Committee, Nomination Committee, Asset Liability Management Committee, Risk Management Committee, Investor Grievance Committee etc. He then briefly discussed different Disclosure Issues on the basis of mentioning Whistle Blowing Policy, Disclosure of Remuneration, Governance Report, Codes, Financial Report etc. In the final thoughts it reveals that overall governance practices of MFIs operating in India are not satisfactory. He focused on Trustee and told that individual director should be prescribed with immediate effect.

Prof. Kumarjit Mondal asked one question on corporate governance and the speaker answered and after that Chairperson requested Co-Chairperson to give his observation and Co-Chairperson briefly gave his observation and declared the session is closed for the lunch.

Post Lunch session

The post lunch session of the second day of the conference was divided into two parts.Firstly, a panel discussion was organized on the theme " End of Planning era in India." This panel was chaired by Prof Biswajit Chatterjee,President of BEA. Professor Ajitava Roy Choudhury of Jadavpur University, pointed to the gap left by the planning era in the formulation of planning strategies for Indian economic development. There was a need to incorporate the contribution of human capital formation in the exercises of calculating India's GDP growth. Policy paralysis of the last phase of the UPA government was replaced by the formation of NITI Aayog to formulate long term plans of next fifteen years, with no concrete suggestions to solve the country's economic problems, the "Make in India" slogan did not find answer to the process of jobless growth that India experienced in the recent decade. Prof Sudakshina Gupta of Calcutta University gave a detailed account of the planning process, with thrusts on inclusive growth and people's participation, but the process of eradication of poverty and unemployment could not be initiated. Professor Santanu Ghosh of Maulana Azad College, Calcutta, described the historical record of our plan formulation with the participation of intellectuals like Nicholas Kaldor and others from abroad, and Prof K.N.Raj and others from the Indian side, particularly during the Nehruvian period. Professor Chatterjee mentioned

that upto the tenth five year plan , there were attempts to develop macro-models for the Indian economy by the erstwhile Planning Commission, and that seemed to have been discontinued now under the NITI Aayog .

The second part was the Valedictory session of the Conference. After the initial welcome to the invited guests, the President of the Parishad presented the two Awards.The S.R.SEN Memorial book prize was awarded to late Prof Kalyan K.Sanyal, posthumously for his book "Revisiting Capitalism", and Dr.Swaswati sanayal, his wife received the award on his behalf and thanked the BEA for bestowing this honour to Professor Kalyan Sanyal.Then the "Panchanan Chakravarty Memorial Best Teacher Award" for 2017 was conferred to Professor Dipankar Dasgupta for his lifetime contributions to teaching and research in economics in India and abroad. Professor Dasgupta, while receiving the award, thanked the BEA for giving this honour to him , and delivered his valedictory Address on his experience as a Teacher in ISI,New Delhi and Calcutta.

The conference ended with thanks to the participants, invited guests and speakers, members of BEA and the Organisers of the 37th Annual Conference,in which representatives from NABARD And ICSSR-ERC took part on both the days.

Prepared by Dr.Mou Roy, Dr. Purba Chattopadhyay, Dr.Sudip Jana, Dr.Debjani Mitra, Dr. Niladri De , Sm. Sakhi Roy, and Dr. Ruma Bhattacharya

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Published by Secretary, Bangiya Arthaniti Parishad, 87/277, Raja S. C. Mallick Road,
Ganguly Bagan, Kolkata - 700 047.
Printed by Tamojit Bhattacharya, Kolkata Mudran, 12, Biplabi Pulin Das Street,
Kolkata -700009, Phone: 9123018766, e-mail : tamojit.kolkatamudran@gmail.com