Online ISSN : 2249-4588
Print ISSN : 0975-5853

Global Journal

of Management and Business Research: B

Economics and Commerce



The Cost of Logistics

Policy Challenges for Australia

Highlights

Economic Growth in Iran

Level of National Intelligence

Discovering Thoughts, Inventing Future

VOLUME 14 ISSUE 2 VERSION 1.0

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Volume 14 Issue 8 was originally issued as B2

Global Journal of Management and Business Research: B
Economics and Commerce

Volume 14 Issue 8
Originally issued as B2

Global Journal of Management and Business Research: B
Economics and Commerce

Volume 14 Issue 2 (Ver. 1.0)

Open Association of Research Society

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Global Journal of Management and Business Research: B
Economics and Commerce
Volume 14 Issue 2 Version 1.0 Year 2014
Type: Double Blind Peer Reviewed International Research Journal
Publisher: Global Journals Inc. (USA)
Online ISSN: 2249-4588 & Print ISSN: 0975-5853

The Cost of Logistics

By Liběna Kantnerová
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Abstract- The paper shows problems in the logistics and supply chains in the condition of enterprises in the Czech Republic. This subject was chosen because of the previous practice of the author.

The top priority is screening of cost born in logistics. The paper deals with the logistics and logistics controlling as a potential source of savings and finding new possibilities for better organization and functions.

It includes results of the research in the southern part of Bohemia. Data set was obtained from answers in questionnaires aimed to key issues of logistics and logistic controlling.

The results of paper proved that bigger enterprises paid more attention to investigated problems – creating information sources and setting specialised departments.

In the future there is a need to find the way how to establish the condition of controlling in small and medium sized enterprises.

Keywords: *cost of logistics, supply chain, logistics, controlling, questionnaire research.*

GJMBR-B Classification: *JEL Code: D3, M1, M4*

THE COST OF LOGISTICS

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The Cost of Logistics

Liběna Kantnerová

Abstract- The paper shows problems in the logistics and supply chains in the condition of enterprises in the Czech Republic. This subject was chosen because of the previous practice of the author.

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In the future there is a need to find the way how to establish the condition of controlling in small and medium sized enterprises.

Keywords: cost of logistics, supply chain, logistics, controlling, questionnaire research.

I. Introduction

Enterprises try to raise its financial and economic efficiency, to adapt to constantly changing trends and to remain on the market. Ensuring the competitiveness of the enterprise is more demanding than ever. Rising costs, relatively saturated markets and disappointing economic trends, problems with legislation and tougher competition on the domestic and foreign markets have increased the pressure on productivity and efficiency.

Due to emerging problems and current global recession, current procedures are not sufficient for successful management. Therefore, entrepreneurs and managers need to extend existing methods with new ones, which will lead to better management. There is a necessity to find new approach to solve economic crisis and it can be achieved by introduction new concepts and technologies that may help to achieve the main objectives, mainly to ensure profitability and liquidity of the company.

In addition to these key objectives, it is now necessary to focus the management efforts on maintaining a market position, customer satisfaction, the continued existence of the company and its growth potential Strategy can be viewed as building defenses against the competitive forces or as finding a position in an industry where the forces are weaker. Changes in the strength of the forces signal changes in the competitive landscape critical to ongoing strategy formulation. In exploring the implications of the five forces framework (Porter, 2008).

An important factor is the involvement of workers themselves to meet corporate objectives, which can be achieved by building the appropriate corporate culture and promoting their professional and personal development.

Unlike developed countries like the U.S. and the majority of Western European states, controlling logistics and logistics are often neglected in the Czech Republic. Only some companies, generally the larger ones or branch offices abroad, incl. some supply chain of retail in food, pay more attention to these issues. Therefore, this investigation follows a sample of enterprises with no previous selection according to the size or focus of the companies in order to compare the interests of the logistic problems in all sectors. In the paper, the author stated some practical experience of companies.

The biggest problem is to find the right criteria for the screening. The next table 1 shows the evolution of logistic criteria in the USA in last 50 years.

Table 1 : The Preference of Logistic Criteria in Time

Period	Indicator
1960	The total production costs
1970	The costs of the production and stock
1980	The transport costs
1990	The costs of distribution and logistics
2000´+	The costs of Supply chain and clients service

Source: Coyle, Bardi, Langley, 2003

To the logistics is paid big attention from the eightieth. The break of century is time, when started the being of Supply chains and their number is growing, in the Czech Republic too.

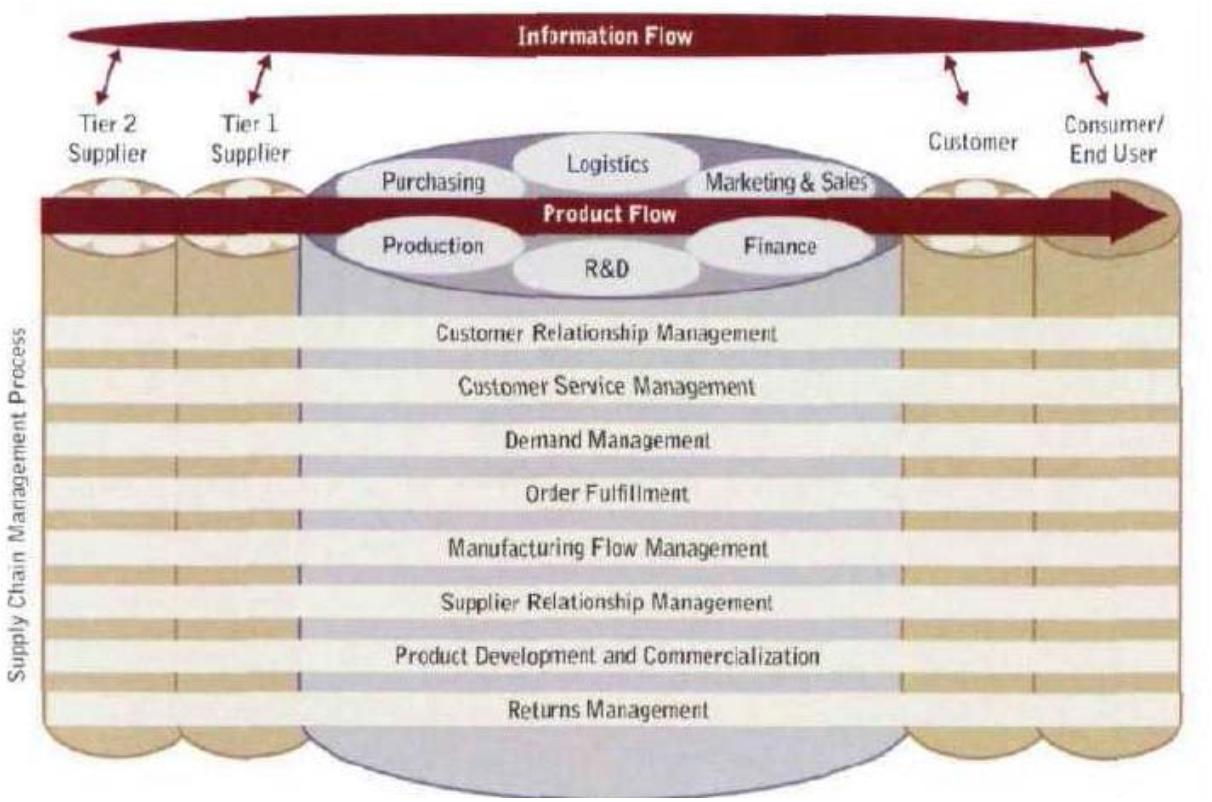
The following figure shows the simplified structure of supply chain in the production company with two groups of suppliers in the flow of information, goods and eight processes of Supply chain management (which was described in the Global Supply Chain Forum at the University in Ohio, the USA).

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8 processes described in the figure are:

1. Customer relation ship management – the connecting part in negotiation with customer
2. Customer service management – the part building the relation with customers
3. Demand management – the management of demand of the market
4. Order fulfilling
5. Manufacture flow
6. Supplier relationship management
7. Product development – the production and introduction of products in the market
8. Return management – is concerning to empty packaging and destroyed goods which should be environmental.



Source: Lambert, Cooper, Pagh, 1998

Figure 1 : The Structure of Supply Chain

II. Definition of Controlling in the Literature

By Freiberg (1996), this word originated in the USA and consists of two meanings of the English verb "to control". It means regulating and managing as well as checking and testing. The controlling activity limited to the checking process only would never bring any innovation in the business activity. The innovation is connected with the activity of managing and regulating in which controlling has become a specific concept of business management based on complex informational and organizational connection of planning and control processes.

Controlling also has to ensure the interpretation of predicative abilities of background information used by managers. The key task of controlling is to secure and prepare written source materials for planning and decision making. Controller (worker of the controlling department) has to be a co-ordinate partner of management workers without power to take decisions about concrete economic concepts of future business development (Sixta, Mačát, 2005).

Petřík (2007) noticed that nowadays controlling is concerned in a more complex way in foreign practice as a concrete integration method – management system. In this respect, controlling uses both financial and partly non-financial scales. The main idea of this conception of controlling is to set desired, clear, measurable, comprehensible acceptable targeted data and information as well as current and desired economic and financial situation of firms and organizations that are generally defined as basic aims of a firm.

Controlling should be also considered as developing system of economic subject management that is strategically oriented to future, closed, comprehensive, suitably connected and coordinated.

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This paper deals with the logistics and logistics controlling as a potential source of savings and finding new possibilities for better organization and functions.

In the Czech Republic, SMEs are defined as companies with up to 250 employees and the turnover up to 43 million CZK per year. There are about 1 million of such companies, which represent 99.8 % of the total. SMEs represent 61 % of total number of employees

Aims:

1. to analyse the situation related to logistics in the sample of 221 enterprises;
2. to analyse a relation of the size of enterprises (rate of turnover and a number of employees to use of such criteria;
3. to discover how often – if so – enterprises deal with improving of relation between suppliers and consumers and discover the most usual way of assessment of the above mentioned relations.

III. Methodology

The first step was to assess the current situation in the sample of 221 enterprises. Questionnaire aimed at key issues of logistics and logistic controlling was prepared.

The investigation was applied mostly to enterprises in the region of South Bohemia (65.6%); mostly aimed at production (42.1%), followed by services (32.1%), trade (16.7%) or combined. There were 3.6% of enterprises focused on production and trade; 3.6% of enterprises focused on production and services; 1.4% of enterprises focused on services and trade and 0.5% of enterprises focused on all three sectors (production, trade and services).

All data were processed by correspondence analysis (CA) - a unimodal ordination method. Main aim of this method is an overall review of such a huge data set (132 possible answers to the questions in the questionnaire). It is able to find main trends in relationships among the answers.

The result of this analysis is an ordination diagram showing points in an ordination space. The distance of the points corresponds to their dissimilarity. Points represent answers to the questions in the questionnaire. Any qualitative answer is shown as a point for each answer any quantitative is shown as a point for the maximum.

Ordination diagram we interpret by the following way : if the point „A“ in the diagram is close to the point „B“, then in the case of signing answer „A“ by the company (in the questionnaire), it means probably the signed answer „B“ simultaneously. If would be the point „A“ on the opposite side of diagram in comparison with localisation of point „B“, than the company signed in the questionnaire the answer „A“, but no „B“. If would be on one side of the diagram a point, which show some quantitative answer (turnover, number of employes or products, suppliers, etc.) than all points on this side of diagram we can suppose they relate to enterprises, which have the high level of this quantity . Points on the opposite side of the diagram are related to enterprises with low level of this quantity. If the point lies in the middle of the diagram, than we can say\, that all enterprises answered without any relation to main trends.

The Canoco for Windows program was used to process CA (TER BRAAK & ŠMILAUER 2002).

As I was especially interested in monitoring of logistic criterions, I examined it more carefully by logit regression. This was processed by statistical program R 2.9.0.

Finally, a percentage of enterprises that answered individual were calculated for some questions.

IV. Results

In the following part of the paper, numbers referring to a number of a question in the questionnaire are enclosed in brackets.

In the ordination diagram CA (figure) is obvious trend that bigger enterprises were formed on the left side (3, 4) and smaller ones on the right side. Bigger, mostly enterprises with a logistic department (8a), also had often internal department of controlling (21b) and logistic activities were regurarly monitored (14a). They usually had some of certificates of quality (7A) and often used some of logistic or managerial methods (e.g.. Quick Response – 13b, KANBAN – 13e, MRP – 13f, ABC – 13g, benchmarking – 13k, Balanced Scorecard – 13l or searching of bottleneck 13m). This professionál approach is necessary for bigger companies, because of huge quantity of products, finances and employees there is not any other choice. They used for transport of products roads or combined transport (31c).

On the other hand smaller companies did not have any logistic department. They did not deal with logistic activities continously (.4b), do not inform their suppliers about results of their investigation (20PN, 20NN) and did not have any certificate of duality (7N). They supplied goods mostly to final consumers and used roads or other transport (31d).

The profile of companies was corresponding with this trend. Bigger companies are mostly oriented to production (V) and smaller were aimed at service (S). Business companies are left beside (O), because they are not marked in size of turnover or number employees. More or less, i tis possible to noticethat they tended to be smaller. They were defined by larger assortment (1), which is often changed (32), and by higher part of goods in stock (2b). Enterprises in the sample were oriented to services had small assortment (1) and it change only little (32) in the diference of production or business companies.

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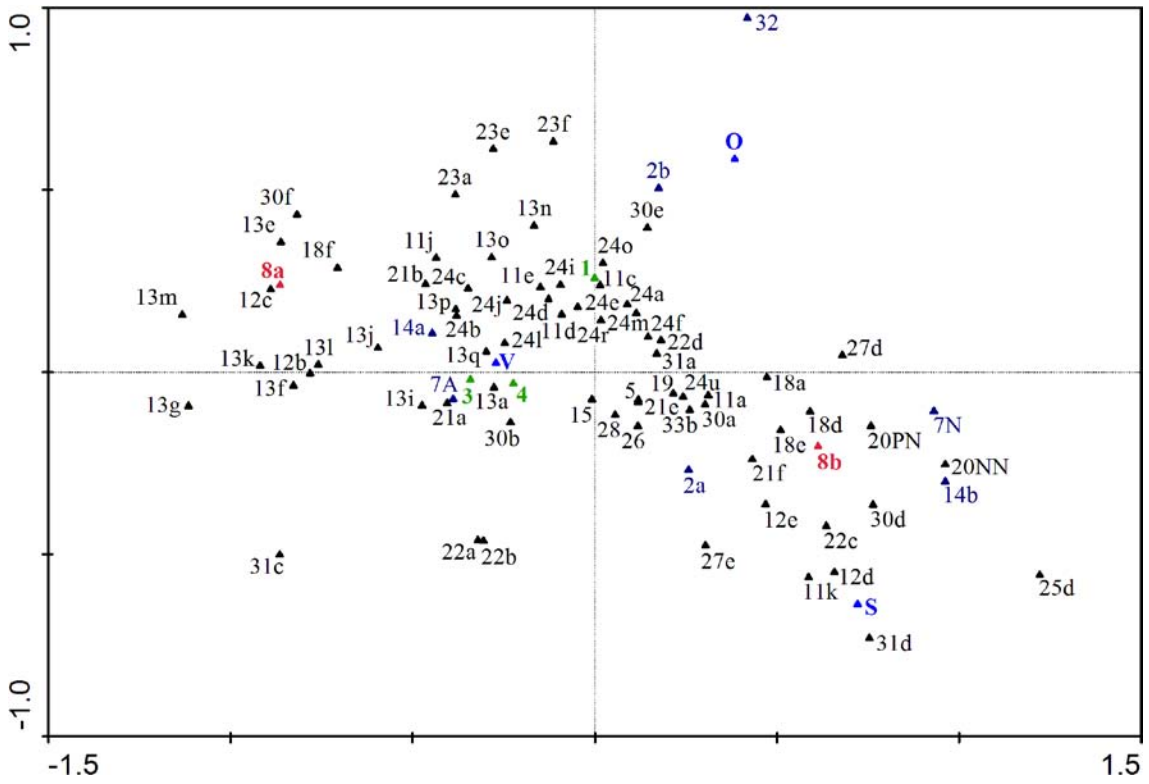


Figure 2 : ordination diagram of correspondence analysis. The first two axes represent 20.3% of variability (horizontal axes represents 12.2% of variability). Points denote 85 answers that most fit to the first two axes. Key points are highlighted. Author's own work

This ordination diagram shows main trends in relations of questions but some details may be hidden. As I was especially interested in which logistic criteria do the enterprises monitor, I have carefully proven the relationship of this question (24) to the number of employees in an enterprise (3). I have chosen this variable according to the ordination diagram as a representative of the main trend.

The majority of logistic criteria are monitored by significantly higher proportion of bigger enterprises. There were only few exceptions that did not depend on enterprise size, such as stock costs (24f), an average inventory (24m) or monitoring the maturity of invoices (24u). Criteria, monitored by mostly small companies, were closely connected with their cash flow. The fact, that all criteria were more monitored by bigger companies is related with the existence of specialised departments, for which these enterprises have more funds and they need to be better oriented in the problems. Figure 3 and Table 2 summarise the results.

Figure 3 also shows logistic criteria mostly screened in Czech companies. The majority of enterprises monitored the maturity of invoices. This is a result of the fact that this is one of the key items of accountancy.

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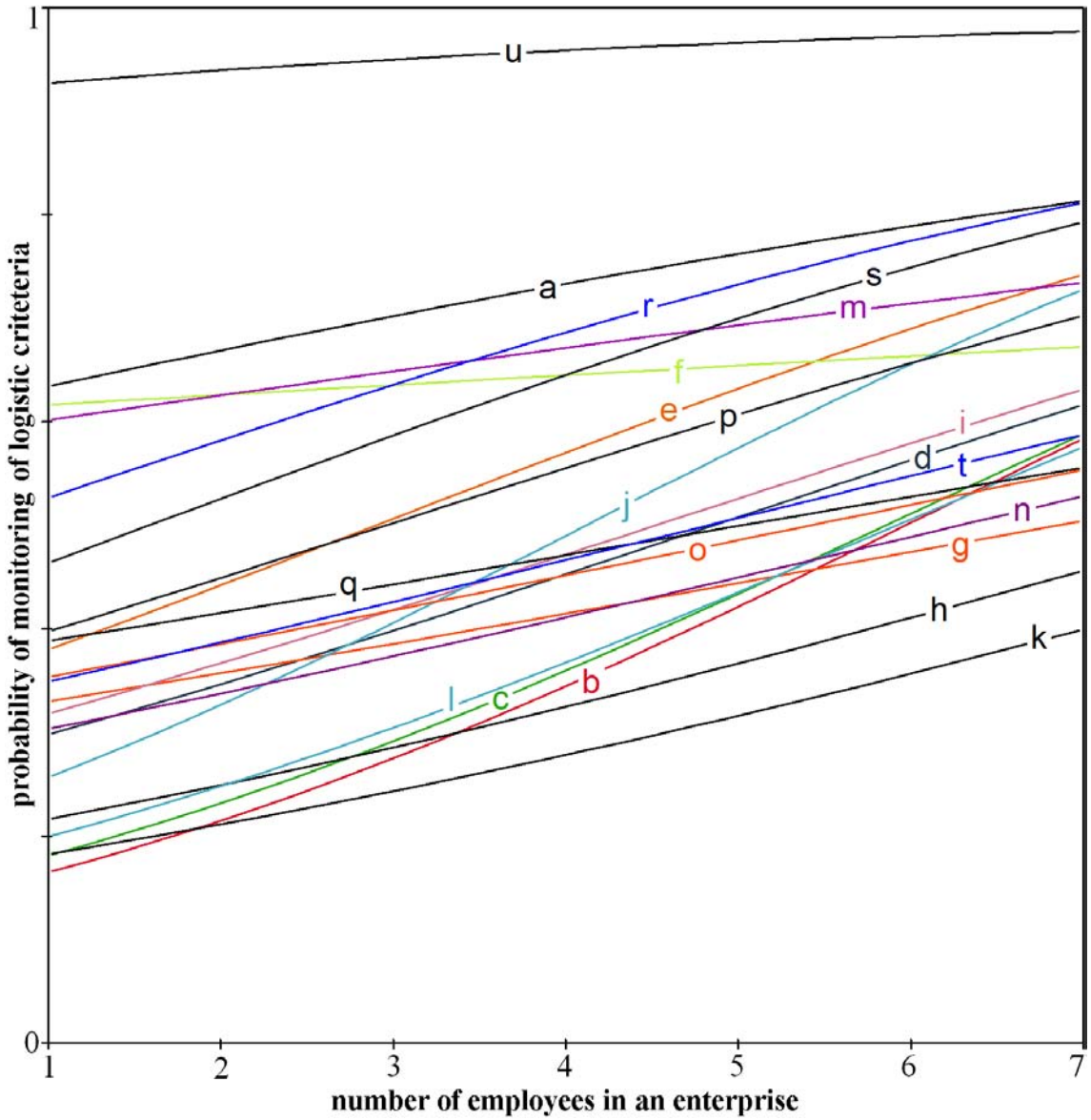


Figure 3 : Logit regression of individual answers on question No. 24 (monitored logistic criteria) on variable No. 3 (number of employees in an enterprise). Author's own.work

Table 2 : Results of logit regression of individual answers on question No. 24 (monitored logistic criteria) on variable No. 3 (number of employees in an enterprise). r: correlation coefficient; p: significance level (p<0.001: ***, p<0.01: **, p<0.05: *, p<0.1: .). Percentage of each criterion is also shown (%)

Criterion	%	r	P
Monitoring the maturity of invoices	91.0%	0.10	
Capital bounded in inventories	67.4%	0.12	*
Average inventories	62.4%	0.09	
Costs for purchasing of stock	61.1%	0.04	
Following the time of dispatch	61.1%	0.18	**
Share of sales returns	56.6%	0.20	***
Storage costs	49.3%	0.21	***
Transport capacity use	48.9%	0.18	**
A number of errors in deliveries in overall volume	43.0%	0.10	.
Costs per unit of purchased/dispatched goods	41.6%	0.14	*

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Number of turnovers per year	41.2%	0.18	**
Inventories turnover time	40.7%	0.28	***
Storage capacity use	40.7%	0.12	*
Average transport costs per 1 t of goods	39.4%	0.19	**
Costs due to logistic activities capital acquisition	37.6%	0.11	.
Revenue from saved costs due to a change of transporter	36.7%	0.14	*
Average costs per storage unit	30.3%	0.24	***
Share of storage costs in total costs	31.2%	0.26	***
Working capital in logistic activities.	29.0%	0.27	***
Costs due to a decrease of the inventories value	28.5%	0.16	*
Number of dispatched items/day (or other time unit)	24.4%	0.15	*

221 enterprises in the sample revealed that 25.8 % had a logistic department and 10% had a department of logistic controlling or internal audit (29.9 %). The following table present what kind of activities is dealt with at such departments (table 2) or at departments, to which are these activities transferred (Table 3).

Table 3 : Activities Performed at Departments of Logistics

Aktivity	%
Order processing	85.5
Operational management of production	28.2
Management of supplies	47.0
Storage	50.4
Package and expedition	47.9
Quality check	29.9
Transport	56.4
IT	21.4
Logistic controlling	17.9
Reverse logistics	12.0
Other activities	3.4

If there doesn't exist specialised department of logistics, some other department should practice logistic activities. Which departments adopted these activities shows table 4.

Table 4 : Departments that Practice Logistic Activities too

Department	%
Business	42.7
Economic	19.7
Production	6.7
Transport	12.5
Other	21.5

Transferring of logistic activities to business department seems to be an appropriate solution. Trade department is concerned in high levels of economic indicators (inventories; transport) and monitors their cost as well as operational features compared to economic department. Problems with missing logistic department will rather influence logistic controlling and reverse logistics.

Activities that are bought from external companies are shown in table 5.

Table 5 : Outsourcing of Logistic Activities

Outsourced activities	%
Transport	54.7
Storage	11.9
Package	3.4
Other	5.9
No activities	24.1

The system of logistic activity monitoring is usually unsatisfactory (25) in smaller enterprises. This system is not used (25d) in small enterprises without logistic department. Questions 25e (change in a system of document flow) and 25f (results has improved after identifying a logistic problem) were answered positively by enterprises with greater return without a logistic department (see figures 4 and 5).

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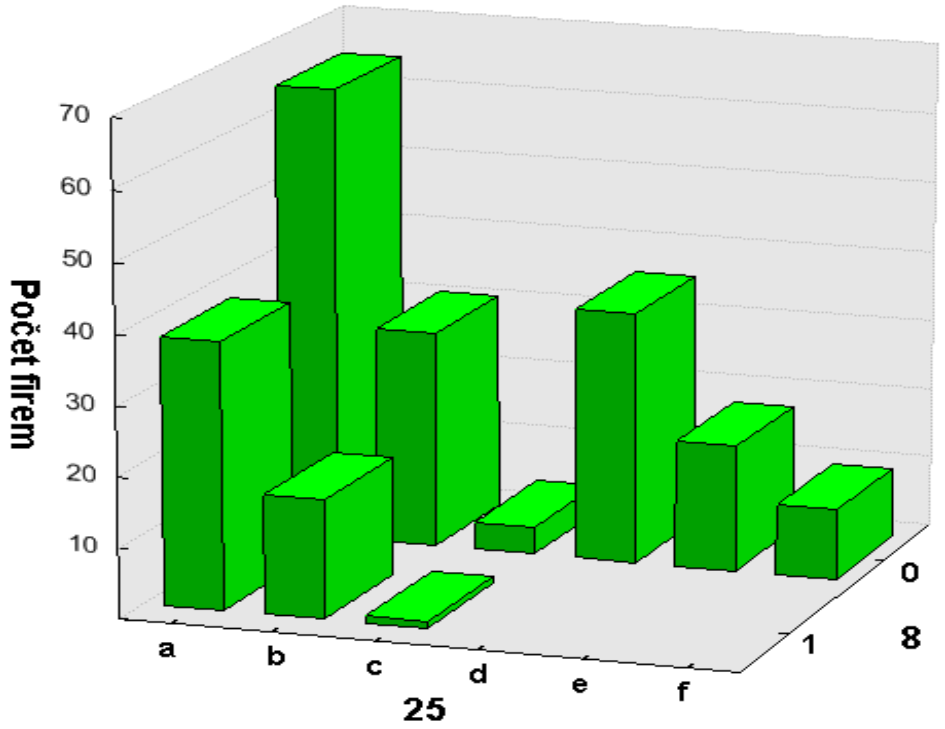


Figure 4 : The relation of satisfaction with the system of screening of logistic criterions (25) to the existence of logistic department (8). Om the left axis there is number of enterprises

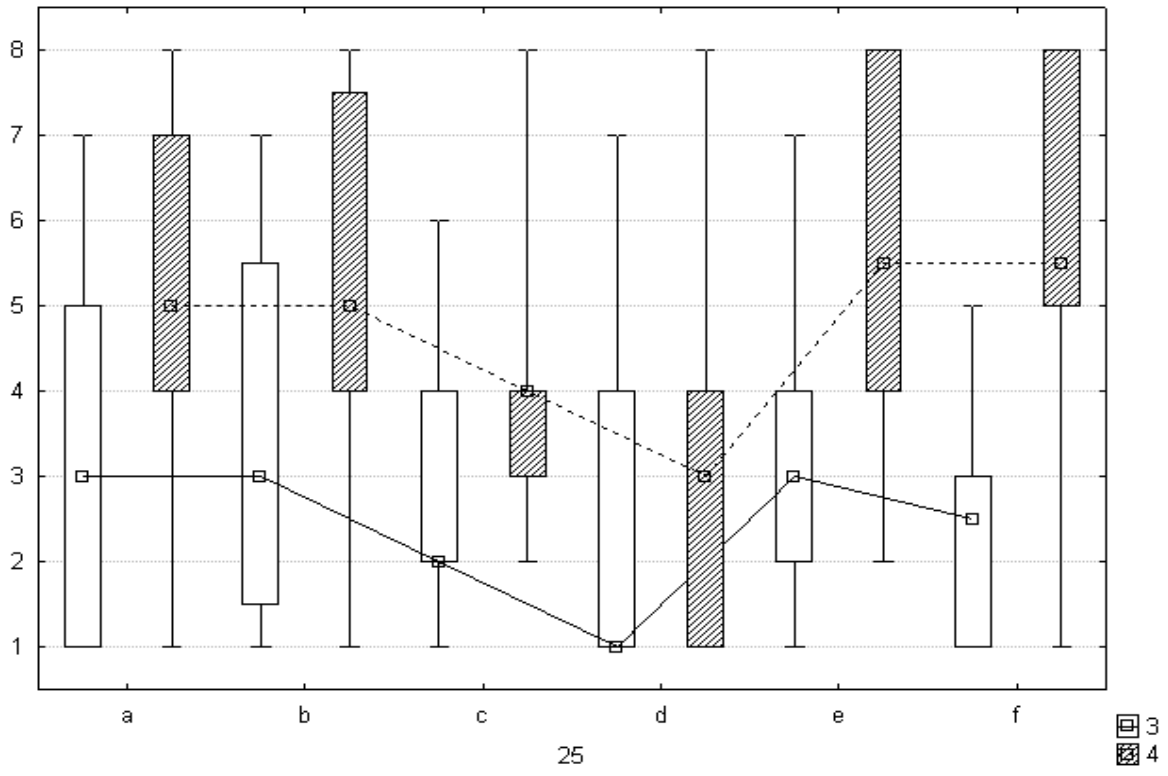


Figure 5 : The relation of satisfaction with a system of screening of logistic criteria (25) to size of company (.3 and 4). For explanatory notes see enclosure. (Point–median, box-quartile range, bar – range of value, source-author's own)

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V. Discussion

Small and long-neglected problems always rise to prominence in times of recession. Enterprises have to seek new strategies to remain in the market trying new methods which could help save the company's existence and prosperity and jobs.

Paying more attention to logistics and logistic activities may find a potential cost savings or a source of increased performance. Changes in logistics-related activities especially with orders and shipping can increase customer satisfaction and hence loyalty. Outsourcing of logistic operations can yield the same effect.

Controlling and its introduction into the business processes is also an important part Creative use of accounting, financial, marketing and product information may be a way of timely recognition of emerging problems and preparing appropriate instruments, including adjustments to the plan or strategy for their elimination. Information technologies looks as very important in these processes, because are in all areas of management and all control processes, which are decision-making processes, subsequently influencing the processes and control processes while all the mentioned processes are realized through information processes. The company information system should satisfy all the company functions while ensuring them with the necessary amount, structure and quality of information. The quality of management decision – making depends on a number of factors influencing the situation. Inadequate response in the solution of any situation or factors in any external or internal process may lead to occurrence of partial or more comprehensive crisis situation.

Incorporation of audit and controlling in a company are shown in the following figure.

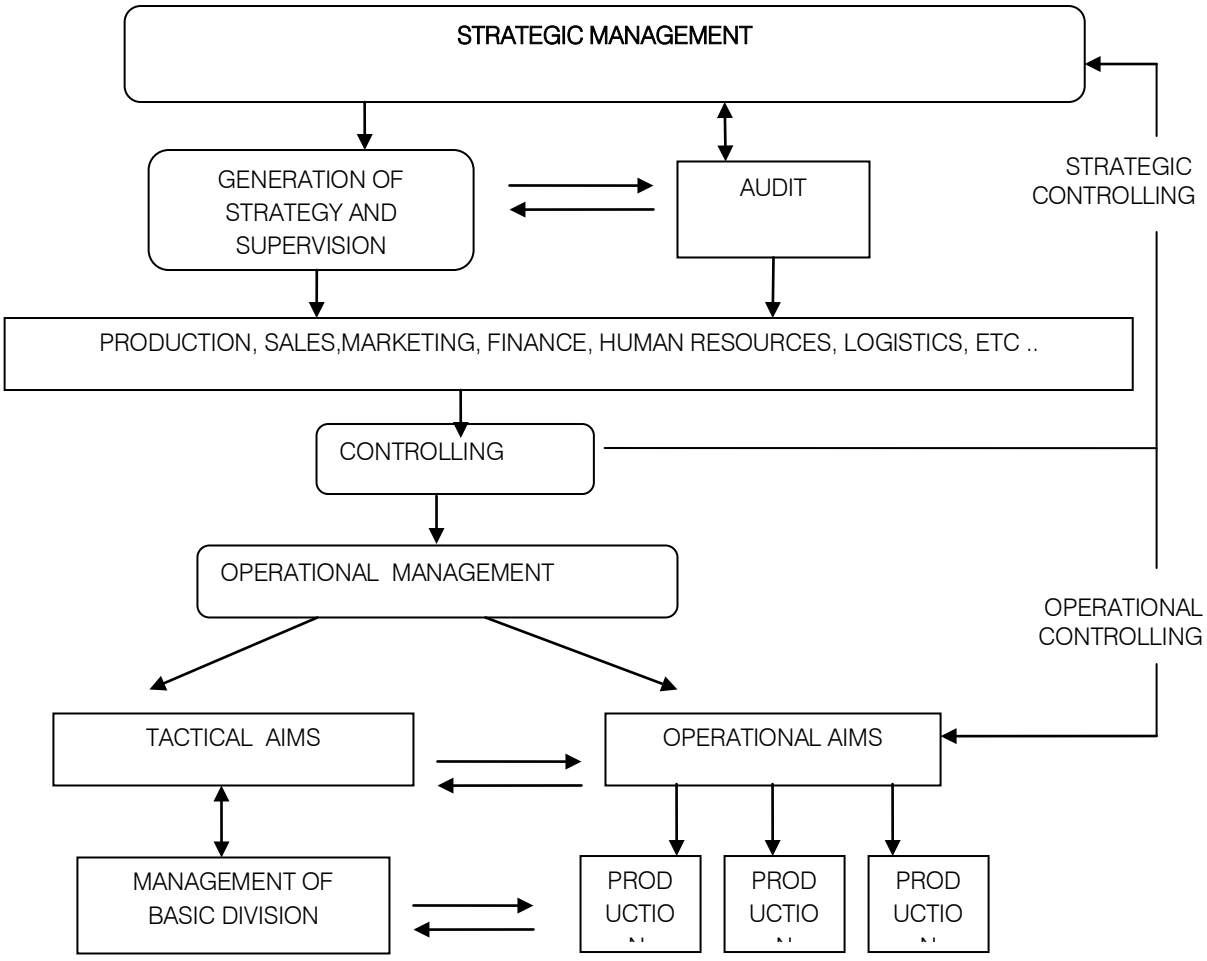


Figure 6 : Incorporating of audit and controlling in a company – author's own

Figure 7 shows concrete influence of controlling and its indicators to all spheres in the business in any company.

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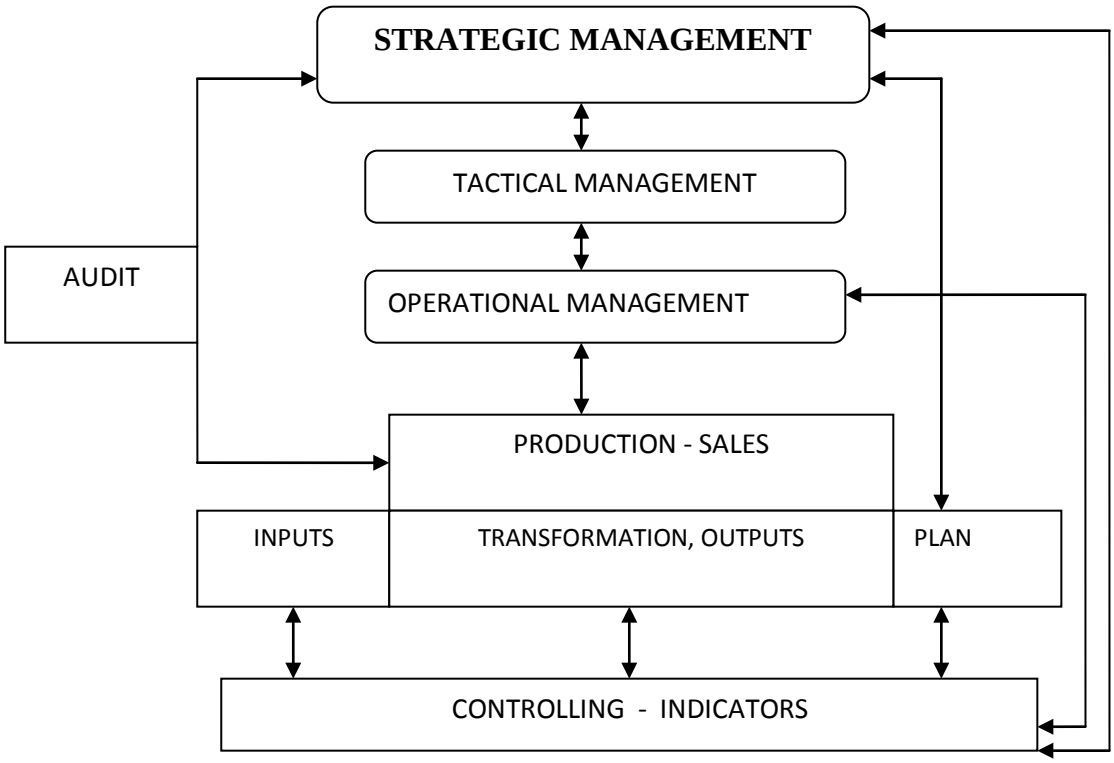


Figure 7 : influence of controlling and its indicators to all spheres in the business – author's own work

The importance of information is shown in figure 8.

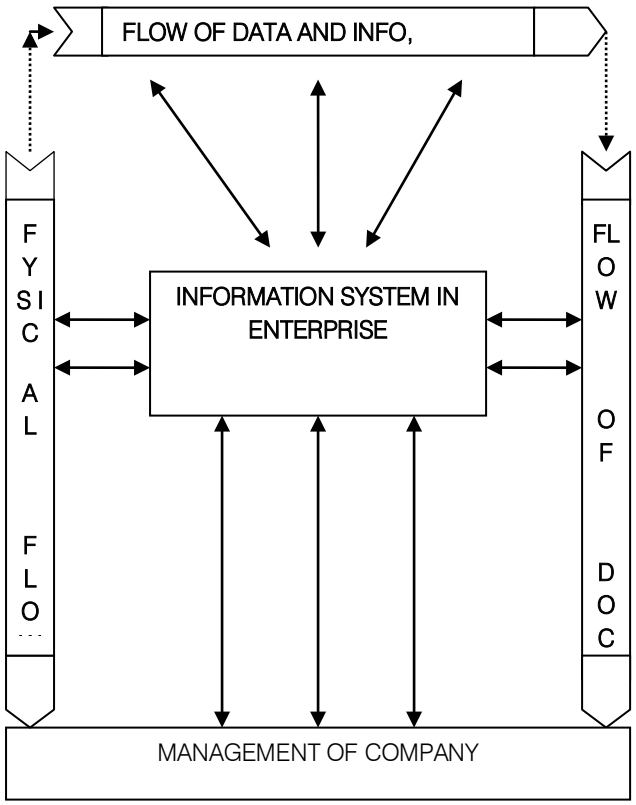


Figure 8 : Importance of right flow of information – author's own work

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VI. Summary

This paper deals with the logistics and logistic controlling as a potential source of savings and finding new possibilities for better organization and functions of any enterprise, the most for the supply chain. Why? Because the Supply chain plays the same role in the market as big company. They have more funds and power to based special departments screened the right function of the system. It looks to be the aim for smaller companies to entry in such chains and to use advantages being consequent from such activities.

The results of the paper proved that bigger enterprises paid more attention to investigated problems – creating information sources and setting specialized departments. Such enterprises also paid more attention to keeping and improving relations with their suppliers. Such relations are related to logistic activities as a source of additional advantages and profit.

The author focused on using logistic metrics in companies, which become components of supply chain. During this stage of the research were found some more frequent logistic criteria. Logistics and logistic controlling may also use common methods of management focused on the above mentioned categories. In the paper author stated some practical experience of companies and particular approaches on how the respective situations can be approached and used in a practical manner. The integration processes characterizing the current state and prospects of changes in Europe and worldwide, i.e. include the economy in the Czech Republic as part of the EU. It is important to be ready protecting company in the process of globalization and find special advantages how to penetrate in some other markets.

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Global Journal of Management and Business Research: B
Economics and Commerce
Volume 14 Issue 2 Version 1.0 Year 2014
Type: Double Blind Peer Reviewed International Research Journal
Publisher: Global Journals Inc. (USA)
Online ISSN: 2249-4588 & Print ISSN: 0975-5853

Grameen Bank and its Sister Organizations- Grameen Chek and Grameen Krishi (Agricultural) Foundation Not Only Providing Credit: They Guide the Landless Families in Bangladesh for their Development

By Dr. Kazi Abdur Rouf
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Abstract- This paper talks about Grameen Bank (GB) micro financing program features, strategies, policies and its two other sister organizations Grameen Chek (GC), involves in manufacturing handloom garments and Grameen Krishi (Agricultural) Foundation (GKF), engages in agricultural activities and irrigation management in Bangladesh. All are social business organizations in Bangladesh. GKF runs its farms 'no loss basis'. Grameen Bank and Grameen Chek run their programs without receiving external funding; rather these two organizations have operated their programs from their own generated funds. Moreover, Grammen Bank and Grameen Chek are free from external consultants` pressure rather they are developing their programs, policies and implementation strategies by using their in-house staff skills and experience.

Keywords: external consultants; external funding; grameen bank; grameen chek; grameeen krishi foundation; internal funding; empowerment; implementation strategies, poverty eradication.

GJMBR-B Classification: JEL Code: A19, Q00



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Abstract- This paper talks about Grameen Bank (GB) micro financing program features, strategies, policies and its two other sister organizations Grameen Chek (GC), involves in manufacturing handloom garments and Grameen Krishi (Agricultural) Foundation (GKF), engages in agricultural activities and irrigation management in Bangladesh. All are social business organizations in Bangladesh. GKF runs its farms 'no loss basis'. Grameen Bank and Grameen Chek run their programs without receiving external funding; rather these two organizations have operated their programs from their own generated funds. Moreover, Grammen Bank and Grameen Chek are free from external consultants` pressure rather they are developing their programs, policies and implementation strategies by using their in-house staff skills and experience. However, Grameen Krishi Foundation, establishes in 1990, receives start-up external grants from United Nations Capital Development Fund (UNCDF), United States of America International Aid (USAID) and the Royal Netherlands Government. GKF all programs are designed by the western irrigation management consultants hired by the donors. Donor consultants have prescribed programs for GKF without considering the local socio-economic, geo-agricultural and environmental factors. The donors forced GKF to follow consultants' inception mission instructions report, which are irrelevant and expensive for add in Bangladesh agricultural farming. As a result GKF ends up huge loss in 1998.

The objectives of the study are to explore what strategies, policies and tools GB, GC and GKF use in implementing their programs in Bangladesh; and to identify what steps they have taken to address the issue of poverty and make them success. Why they are unsuccessful if any. The research questions are what are strategies, policies and tools GB, GC and GKF use in implementing their programs in Bangladesh. The paper reflects author's own working experience working with Grameen Bank, Grameen Chek and Grameen Krishi Foundation (GKF) in Bangladesh. The paper also includes secondary data from GB, GC and GKF. Moreover, the paper has literature review.

The study finds GKF faces serious fund shortage and problems following consultants' plan of actions in Bangladesh; it accounts ends up with huge loss; however, consulting farm does not response to the problem. Currently GKF reduced its activities, but Grammen Bank continues its massive operation in Bangladesh. GB has 8.7 million clients, it has disbursed $10 billion micro loans to its clients and its repayment rate is 99%. Grameen Chek continues its handloom fabrics production, manufacturing garments and marketing them nationally and internationally, it earns its revenues selling its products that covers its costs.

GB and GC both run their businesses on 'profit basis'. Their organizational foundations are very strong. The study finds a positive correlation between access to finance, economic growth and poverty alleviation. They are not depending on external funding rather these two organizations having created millions of employment among marginalized people and empowered poor people in Bangladesh.

The study shows Grameen Bank, Grameren Chek and Grameen Krishi Foundation are generating a smart economics-sustainable quick impact economy in Bangladesh. Their services can continue in Bangladesh and they are continuously applying their implementation strategies and policies that are suitable to local community context.

Keywords: external consultants; external funding; grameen bank; grameen chek; grameeen krishi foundation; internal funding; empowerment; implementation strategies, poverty eradication.

I. Introduction

There are several rural development and poverty eradication projects initiated by various government and non-governmental agencies in Bangladesh at different times. For example, the Bangladesh Rural Development Board (BRDB), Integrated Rural Development Program (IRDP), Food for Work Program, CARE Bangladesh, Rangpur and Dinajpur Rural Services (RDRS), Village Aid, and Bangladesh Rural Rehabilitation Program (BRRP). However, few projects focused exclusively on women in development and the feminization of poverty. Many of them are charity, temporary relief and handout projects. In contrast the Grameen Bank (GB) micro financing program and Grameen Chek, a sister organization of Grameen Bank, involves in manufacturing handloom garments, continued for more than three decades. They are successful in sustainably addressing poverty,

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creating self-employment and empowering rural women in Bangladesh. Grameen Bank micro lending technology is replicating across the world. Now it is recognized as a model of development work in the world. Grameen Chek fabric business is popular creating local living economics in Bangladesh. Grameen Krishi Foundation (GKF) is providing agriculture irrigation facilities to marginalised farmers in Bangladesh.

This essay focuses on socio-economic condition and morale of the landless before Grameen Bank come in; the implementation steps, features, policies and programs the Grameen Bank engages which has made it a successful national financial institution in Bangladesh and has resulted in its replication across the world. The paper also narrates Grameen two other sister organizations (Grameen Chek (GC) and Grameen Krishi Foundation (GKF) and looks at their financial strategies and operation strategies, and impacts in Bangladesh by following two different approaches (Grameen Bank and Grameen Check internal fund mobilization process and Grameen Krishi Foundation depends on external funding).

II. Statement of the Problem

The destitute poor men and women used to wait at the door of the affluent and village rich for food on the occasions like wedding ceremony, Eid festival, family reunion, post funeral feast etc. To maintain the family, they would sell their labour in advance for 1 year, 2 year or 5 years. Failing to provide food and clothing to the children, engaged them as domestic aids in the homes of rich people. Women folk also used to be engaged as maids in the house of rich people. Weavers, blacksmiths, potters, barbers, carpenters not finding any professional work in the villages left for urban areas and loitered there leaving behind their parents, wife and children. They were working as rickshaw pullers, living in unhygienic shanty slums, women resorting to prostitution; many became street beggars by losing everything after mortgage all their assets including land to the money lenders. They could not meet any of the demands like food, clothing, shelter, health and health and education. They became victims of malnutrition and deadly diseases which crippled them. They could not have full meal with the meagre income in exchange for a day's hard labour, which was inadequate for purchase of essentials like rice, edible oil etc. They could not find capital to invest in business or farming and thereby earning income; even if capital was available, it was from money lenders at exorbitant rate of interest.

GB objectives involve extending banking facilities to the poor for their self-employment, to free them from exploitation by money lenders, and to empower women through providing them with collateral-free loans for doing businesses.

Grameen Bank and other MFIs in Bangladesh have massively expanded microfinance in Bangladesh. Many other countries are trying to scaling up their programs nationally but other than Bangladeshi MFIs have not yet developed a strong system capable of serving massive numbers of poor in a sustainable fashion in their countries. Author finds many MFIs are unable to scale up their programs because unsuitable strategies and policies are barriers to popular and to expand in their programs in their countries. Many MFIs use western consultants to assist them implementing their micro-credit programs and get funding from outsources. The GB implementation strategies, policies and monitoring devices narrated in this paper could help MFIs get ideas from this study.

III. Objectives of the Study

(1) To explore what strategies, policies and tools GB uses in implementing its micro credit operation in Bangladesh; (2) To identify what are steps it has taken that to address the issue of poverty and makes it success; and (3) To know are there GB other sister organizations success in Bangladesh; If yes, what are they; if they are not successful, why they are not successful.

a) Research Questions

(1) What are strategies, policies and tools GB uses in implementing its micro credit operation in Bangladesh; (2) What are steps it has taken to address the issue of poverty and makes it success ; and (3) Are there GB other sister organizations success in Bangladesh; If yes, how they are successful; if not, why they are not successful.

IV. Methodology

The paper reflects author's own working experience working with Grameen Bank, Grameen Chek and Grameen Krishi (Agricultural) Foundation (GKF) in Bangladesh. The paper includes secondary data from Grameen Bank, Grameen Chek and Grameen Krishi Foundation (GKF). Moreover, the paper has literature review.

V. Significance of the Study

a) Socio-economic condition and morale of the landless before Grameen Bank come in

The word 'Bank' was totally unknown to them. They might have come to know the people associated with banks for working as servants/maids or construction labourer. Rich people and village unethical people used to play with the chastity of young girls. Despondency overwhelmed them out of deprivation, harassment, and deception. They hated the life which only knew hard labour, suffered from despair consoled themselves, surrendering to destiny and calling it the mockery of fate. They quietly witnessed the luxury, easy

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life and joy and happiness of the affluent society. They became dumb by losing everything by natural calamities i.e. flood, drought, cyclone etc. their children would have died crying in front of them without medicate and suffering from malnutrition. Thought of killing their wife and children as they could not stand poverty or tried to commit suicide considering the futility of the life they led. They would not allow the young girls to go out as they had not adequate clothing to cover themselves. It became the family tradition not go educate the children as it was unthinkable. The word borrowing was a matter of utter fear. Nobody cared for the welfare or safety net of the poor and the destitute. They considered it unprecedented that an educate person would step into their homestead. Throughout their life they knew only how to salute others. Now 8.7 million women borrowers do small business by taking loans from Grameen Bank, earn income, fulfill their basic needs, many of them become formal leader in their communalities and empower in the society. GB many studies talk about the socio-economic impact of GB in Bangladesh. However, there is no study how GB is successful in its micro-credit operation and empowering marginalized people in Bangladesh. Therefore, it is important to know what strategies, tools, monitoring devices GB uses that help GB become a national organization in Bangladesh for more than three decades. This study could contribute to a new body of knowledge of organizational development strategies of GB.

b) Grameen Bank: A ray of Hope

In the words of Kofi Anan, UN Secretary General, "microfinance has proved its value in many countries, as a weapon against poverty and hunger. Now it is recognized as a development model for income generation, self-employment and empowers disadvantaged women all over the world" (Grameen Dialouge-60, 2005, p. 2).

The dedicated Grameen Bank assistants, Bank Managers went to the villages to find out who are the poor people. They go to their landless and asset less people, enquired about their welfare, caressed their children with love and affection, came to know about the miseries of their life. They get the message why those people are at the bottom of the society. Poverty is not the mockery of fate, sale of labour in advance is not the writing of fate; bank is not for the rich, happiness is not forbidden for the poor. It is not the law of the land that poor children would not be able to go to school and colleges; they would not be standing like a statue at the time of disaster; life does not mean only misery and sorrow, a poor woman/ does not mean only labourer or domestic servant or maid. The poor people is capable of doing all sorts of work; they can run business, can can educate themselves, has the sense of distinguishing between good and bad, right and wrong, can establish justice. They have also a role to play as a citizen of the country as well as they can offer leadership in the society. They are also able to enjoy themselves with their family in various festivities. Man is the best creation of God, the Almighty which includes the poor. Grameen Bank is the bank of the poor. According to the rules of the Bank, every poor, landless man and woman can improve their economic condition; can establish themselves in the society. These encouraging words created enthusiasm in the minds of the landless of the area. At first they could not response full trust, are somewhat afraid, but the Bank Assistants, Branch Managers make them realize over time through continuous visits to their houses. The landless people gradually picked up courage; they became conscious of their position. As a result, poverty rate of Bangladesh is decreasing. Poverty rate is 31% in 1999 (Bangladesh Human Development Report (2000) which was 58% in 1981.

c) Rich and village unethical people show adverse reaction

When the rich, village unethical people and money lenders found that the poor people has organized themselves under the inspiration of Grameen Bank, they become active to destroy the bank. As the landless women began to take training from Grameen Bank personnel, they try to outcast them on the plea that these women have committed sin, lost their prestige and became anti-religious. But Grameen Bank Assistants and Branch Managers are undaunted and not to be cowed down, because they have vowed and dedicated themselves for uplift of the standard of life of the landless. They are dedicated to reduce the sufferings of these people.

Bank Assistants and Managers on the one hand and village money lenders and village unethical people on the other side try against to achieve their respective goals with regards to the landless people. The Grameen Bank personnel are emboldened by their great effort. By virtue of their dedication, the evil design of the money lenders and village unethical people withered away. Inspired by the ideals, the landless men and women begin to flock around Grameen Bank by ignoring their age old barriers of customs and traditions.

The whole organizational structure and operation of GB makes borrowing and repayment convenient and easy for its clients. There are no rigid structural policies and monitoring devices by outside consultants. Professor Muhammad Yunus, its founder and charismatic leader, coordinates all staff activities, ideas and recommendations and is the apex leader of GB loan operation. The field staffs of the GB are responsible for developing its loan operation policies, programs and operation strategies, and accounting and monitoring devices (Yunus, 1994).

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VI. Literature Review

Development theories, modernization theories, dependency theories, neo-liberalism theories , structural functional theories, world system theory, neo-institutionalism theories, positivist theory, post-modernistic theory, hegemonic state reproduction models, cultural domination theories, globalization theories, cultural borrowing theories, human capital development theories, knowledge economy theories and reproduction theories all are promoting western capitalism, western ideologies/knowledge, culture, norms and values where donors' technical officials/consultants carry these values through foreign aids strings. Western knowledge, values, ideas and approaches transmit/spread to developing countries with the slogan modernizing developing countries in the name of providing aid and technical assistance. The contents of above stated development theories are determined by who produced them, at which time under what conditions and what purposes (Leys, 1995, p. 8). For example, modernization theories (1960s & 1970s) transmit modern values to the elites of the periphery instead promote people centered development values in developing countries. It beliefs developing countries should move from traditional to modern (western) forms of organization. Development theory (1950s) thinks development is possible in ex-colonial states through economic growth. Dependency theories (1960s and 1970s) beliefs periphery countries can overcome historical barriers through political leaderships and robust theories. The Neo-liberalism (1970s & 1980s) beliefs in market-economic intervention. Andre Gunder Frank criticized modernist approaches where he discovers it is a frame of metropolitan policy as maleficent. Andre Gunder Frank in his study (1996) finds the short comings of application of modernization theory failed in Chile rather this approach promotes American values instead developed this country. However, evolution of these theories especially dependency theory structures of dependence might be overcome while growing interdependence among even industrialized economics (Leys, 1995, p. 31). All these westernized theories led to vulnerability of third world countries as opposed to strengthening their economics.

Moreover, post colonialism theories have been effort to develop shift in the cultural, political and economic arraignments that arise from the experience of European colonialism both in former colonised and colonizing countries. It attempts to interpret the colonial seeks to deepen understanding of colonizer/colonized relationships by drawing attention to processes of trans cultural mixing. However, post-modernism experiences in the light of development in post modernist and post structuralist thought. However, in practice it has been seen global capitalism is spreading all over the world through globalization in the name of trade liberalization, spreading aids, global capitalism, global democracy, and geo-regional politics, globalized standardized education and cultural globalization. However, it neglects an analysis of the possibilities for economic and political change and rejects some approaches that privilege the local at the expense of the global; moreover it is full of complexities of identification (Frank, 1996; Green, 2002; Putnam, 1993; Tickly, 1999). GB initiative is an example that promotes local living economic theory, internal fund mobilization concept and respect local values, norms and culture.

According to Joel Samoff (2009) foreign aid may function more often to extract than to deliver resources and services. However, underdeveloped countries often are receiving foreign aid but fire their development projects. Moreover, the foreign aid does not make partnership between aid recipients and donors rather donors are influencing the aid recipient agencies. Aid recipients become dependent on donors and accept donors' terms of references. This unequal relationship between donors and aid recipients raises the issue of the effectiveness and consequences of external support are in significant part a function of the aid process and the aid relationship (Arnove & Torres, '2007; Bray, 2003, 1999; Leys, 1995; Manion, 2012; Noveli, 2010; Samoff, 2009). It is because of the structure of the aid relationship with aid recipient agencies, not the misunderstandings or insensitiveness or arrogance of a particular agency or individual (Bray, 2003; Leys, 1995; McLaughlin, 1987; Samoff, 2009; Warwick, 1980). They cannot play a generative role in national development rather foreign aid become challenging for the agencies to successfully implement the project (Yunus, 1994). In many cases foreign aid agencies are coercive at implementing agencies, which has happened in GKF case. For example, GKF develops its own action plan to run its 1500 deep tube farms in Bangladesh (Yunus, 1994); however, donors' push GKF to recruit external consultant to guide GKF staff. Donors withheld funds unless GKF recruits local consultants. Donors forces and agrees to hire highly paid Kranti Consulting Inc. and Macdonald Consulting Inc., UK. However, these consulting firms supply people to GKF those who have no practical experience in farming although they are agricultural graduates. Kranti consultants advise agricultural technologies to GKF, which are not fit for local farming. GKF farms infected with insects, crop damages by using hybrid seeds prescribed by consultants and ultimately get huge loss by following their advice. Consultants received 20% consultancy fee from the project budget. After five years, US Aid, Royal Netherland Government and UNCDF discontinued to support GKF farming activities. GKF faces troubles to provide continuous support to the farms. GKF is busy to provide different information, statistics, and accounting reports to consultants, which is time consuming. GKF faces serious fund shortage

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and problems following consultants plan in Bangladesh; however, consulting firms do not response to the GKF problem after the end of the agreement (Grameen Krishi Foundation, 1994).

Partnership for international development cooperation is the currently preferred characterisation of foreign assistance, but partnerships are working side by side to enable the poor to become more self-sufficient (Samoff, 2009; Warwick, 1980). Aid shifts terms to from charity to technical assistance to cooperation to partnership. However, Samoff (2009) finds partnership is used simply to label whatever is the current pattern of interaction between aid provider and the aid recipient. Many support programs-public and private, large and small, government-to government, institution–to-institution-are labelled partnerships. Westerns consultants describe it technical assistance where there is a room for them to take a job from the aid agencies to the aid recipient agencies. However, the aid agencies and aid recipients' relationships perpetuate dependence among aid recipients to donors. Instead equal exchange and share of information, consultants and donors impose their inequalities of power, authority and wealth and perpetuate relations of dependence between them. Until there is an effective partnership, external support cannot be effective in assisting aid recipients to set their own agendas (Arnove, & Torres, 2007; CitiGroup Foundation, 2000; Samoff, 2009, 2003, Yunus, 1994, 2002).

Ownership is another term is important for country led and project led local development, but Joel Samoff (2009) raises two issues- does the development agenda reflect national and local needs, interests and preferences; second do national and local authorities and others feel sufficient responsibility for that agenda to commit themselves to achieving it? These questions are very important because conditionality exercises direct influence through its certifying role. In many cases donors' conditions are unpleasant and unreasonable but they are apparent. Through ownership, local programs external support could be declined and programs could achieve sustainability (Brinkerhoff, 1996; Coleman, 1999; Found, 1999; Samoff, 2009). However, country–led development requires a strong and assertive national leadership, project authorities and ensures welcome diverse ideas suited to local conditions that are willing to have mutual negotiation rather than receive external direction (Bray, 2003, 1999; Crossley & Watson, 2003; Samoff, 2009). Project ownership would be the ultimate goal of receiving foreign aid. In these relationships, donors, technical assistance agencies and aid recipients should have responsibilities for creating open space for and listening to multiple voices. Unfortunately maximum donors are hegemonic top down role players in this game which has happened in GKF case.

According to Joel Samoff (2009) external supports have three sets of values, assumptions and understandings: (1) Human capital development-skills development-alternative investment patterns and rate of return analysis; (2) Focus on internal efficiency of the organization to increase the productivity of organizations; and (3) improve service delivery system-Paulo Freire termed it 'the banking model of knowledge sharing' of both parties. Human capital theory looks at the technical administrative or managerial concerns. In these three approaches it is essential to recognize the critical voices, critiques and innovative departures that emerge within the institution (McLaughlin, 1987; Samoff; 2003, 2009). Human capital development means human skills development through institutional capacity development and support, and structural relationships among donor agencies and aid recipient agencies (Stilitz, 2003). However, instead aid agencies equal partners with aid recipients, they (donors) are reinforcing their agendas, conditions and influence aid recipients. No human capital actual development happens to aid recipients. As a result service providing agencies lose their autonomy and the projects failed. Hence, there needs to balance and intersects external and internal pressures between these two parties donor and aid recipient (Manion, 2012; Novelli, 2010; Rogers, 1996; Samoff, 2009).

Foreign aid plays an important role in maintaining the external orientation. Foreign aid is always a relationship. Unfortunately the aid relationship is shaped by dramatic inequalities of power and influence. The disabilities of the aid relationships are deep and enduring (Samoff, 2009, p. 157). Therefore, the relationship can neither survive nor function without direct and active participation of the aid recipients. Sorry to say funders retain the upper hand. Organizing aid to permit effective transfers and exchanges cannot be achieved by only modifying forms and terminology rather requires structural transformations (Leys, 1995; Putnam, 1993; Samoff, 2009). Author's experiencing obstacle to aids is consultants want donor recipients should intellectual worship and dependence of donors that perpetuates dramatic inequalities of power and influence; therefore, relationships between donors and aid recipients are not direct and no active mutual participation. Every year donor consultants visit GKF for two months and monitor their inception report for GKF. GKF has tried to work with local context, adjust local situation, consultants strict on their own plan. Many meetings have conducted from grass roots to head office level to minimize contradict with between GKF and consultants. Donor consultants are hegemonic attitude to GKF that hampers the GKF farming activities.

Bellow section talks about Grameen Bank (GB) program implementation strategies, policies and tools.

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VII. Projection Meeting

Lists of genuine landless persons are collected before selection of members for group formation. Even before that ideals and objectives of Grameen Bank are expected through mini meetings in different localities. Before a branch is opened in an area, the Branch Manager gathers information from the 4 sq. mile around the areas relating to roads, markets, school, college, landless, middle class, upper class population, money lending system, bank, economic institutions, social framework etc. Projection meetings are held with all sections of people. In the projection meeting, the Area Manager and Zonal Manager high-lights the detailed objectives, ideas and programmers of Grameen Bank. On hearing from Grameen Bank, people thought that the Grameen Bank is as like as other banks. They might face many hassles to get loan from it. But due to honesty and dedication of Grameen Bank personnel, these dishonest people are dropped in the selection process.

a) At the Start, Branch Manager Works Alone

At the primary stage when a branch is opened, generally the Branch Manager works alone. The objective of Branch Manager working alone at early stage and group formation stage is that by working alone he can familiarize himself with people of that area, environment, socio-economic condition, politics, education, religion, culture and values. His other colleagues are posted in turn after 5-6 months. One center comprises 1 or 2 groups. At least after 4 months of formation of first and second groups, another group is formed; the next one is formed after another three months at in the same center. A fully fledged centre of 6-8 groups is formed after two or more years. There is no hard and fast rule regarding how many groups a centre will comprise. This is done according to circumstances. To be on firm foundation it is preferable not to establish 6-8 groups in a centre within 4-5 months.

b) Group Training

The objective of Grameen Bank rules and regulations and credit system is to encourage savings. GB group training includes the 16 decisions programmes of Grameen Bank, Grameen Pension Scheme (GPS)- previous Group Fund (GF), Children Welfare Fund, Special Savings Fund and their use; formation of group and centres, teaching how to sign name; orientation on personal and hygiene, public health, nutrition, planned family, grow vegetables, animal husbandry, method of investment, disaster management, cleaningness, care of mother and children health (MCH) education. Moreover training topics cover duties and responsibilities of borrowers as citizen, remove superstition, grow healthy social values, development of anti-dowry, quarrels and disputes feelings. Training on these subjects is imparted continuously for 2-3 weeks or more. Training courses are held in some rooms, courtyard suitable for landless women and take place in an informal atmosphere through face to face discussion. Writing materials like pen and paper are not used in the non formal group training. Moreover, side by side with giving them direct ideas on the above subjects, efforts continue on Group selection, Group formation, formation of Centre, Centre meeting, proposal for loan, disbursement of loan, utilization of loan, repayment of loan instalment etc.

c) Borrowers are Organized Into Small Homogenous Groups

Such characteristics facilitate solidarity as well as participatory interaction. Here poor need to be organized if they are to acquire the capacity for managing their own development on a sustainable basis. Organizing the borrowers into primary groups of five numbers and federating six to ten groups into centres has been building blocks of GB's operating system. Emphasis from the very outset is to organizationally strengthen the Grameen clients, so that they can acquire the capacity for planning and implementing micro level development decisions. The centres are functionally linked up with the GB's organizational fabric where the Bank Assistants have to attend centre meetings every week. It is in these weekly centre meetings that most of the bank transactions take place.

d) Group Members Select Each Other

The group members themselves are responsible for selecting their peers. They are to be like minded and have similar economic and social back grounds. Male and female will form separate groups and centres.

e) Subjects Relating to Evaluation of Loans Proposals

Following recognition of groups, a member becomes eligible for credits. Before a loan is sanctioned, Bank Assistants, Managers mix with the prospective borrowers for 1-2 months and through training and exchange of information form an idea as to how much loan is required, and how much income will be generated from investing the borrowed fund. They find them the way how to earn income by utilizing limited amount of loan money. At the primary stage, they are given proportionately less amount of credit and provide opportunity for them to invest and utilize the loan. By turn, the member takes higher amount of loan and expands his business. Bank Assistants and Managers keep watch how the member invests his funds. They keep on counselling about earning higher income from the invested fund. They explore market possibilities for the produced commodity. They also explore market outside the area and pass on the information to the Assistants always keep track how much members are benefited from the loan, how much income they are

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getting. In short, the Bank keenly observes the activities and thinking, movement of the members and guides them accordingly. They are advising them according to their needs. They expressed sympathy at their misfortune, provide courage and inspire them, advise them on their children's education. If by chance any members lose his capital and needs additional capital, the Bank has programme to provide appropriate amount of limited capital.

f) Loan Sizes Grow Slowly

The amount of the first loan is usually very small which vary between Tk 2000 ($30) to Tk. 6000 ($90). Given the limitations of the entrepreneurial capacity of the poor and the market conditions this amount is sufficient for them to initiate activities leading to self employment and gradually raise their incomes. With the gradual gaining of experience and increase of confidence, they borrow larger amounts in the subsequent years. It has been found that GB members would increase their working capital by 3 times in about 2.5 years.

g) Borrowers are the Choosers

The poor GB borrowers decide the area or the activity where to invest the money and how to run the shop. They are the ones who have the real stakes to realize the profits and thus have real freedom to make choices. Thus, the choices of investments are numerous. They clearly and carefully study their local markets, understand the signals and respond timely to reap the benefits. The selection of the activities or the areas where the loan, money will be invested are discussed at length in the centre meetings and is unanimously approved by the group. Self- chosen economic activities increase the sense of participation and strengthen the base of self-help.

h) Approval of loan proposal and disbursement of loan

After recognition of group and before loan proposal, Branch Manager and Bank Assistant keep in view the frequency of presence in centre meeting, savings habit and capacity of investment of a member. Center Chief and Group Chairman watch the changes in loan prayer's investment capacity and other related factors. The deficiencies of a member are repeatedly brought to his attention so that he is well aware of them and can rectify him.

All five members are not given loan at a time after their recognition of the group. Generally, priority is given to other three members excluding the Chairman and Secretary. Loan proposal from the centre is made maximum for two at a time. First recommendation to a loan proposal is made by the Chairman and next is Center Chief. The loan proposal recommended by the center is discussed and evaluated by Bank assistant at center meeting and he also recommends it and submits to the Branch Manager.

The Branch Manager reviews different aspects of the loan proposal and forwards to area office for approval supported by necessary documents. Area manager approves the loan. It takes maximum two days for processing all these formalities at different stages. These tasks are completed at utmost speed and loan is disbursed to the members.

i) Utilization of loan in 7 days

Member is required to invest the loan revived by him within seven days. After seven days, instalment at the rate of 2% on loan has to be repaid at the next consecutive centre meeting. And the member has not to go the bank for payment of the instalment. Bank Assistant goes to the centre for collection of the instalment. The centre meetings are over by 8:30 in the morning.

j) The Bank goes to the people

Loan is delivered to the GB members' right at their door-steps. The borrowers need not come to the town; they do not incur any extra expenditure to get the loan. The poor appreciate the bank`s concern for their well being and reciprocate with satisfactory performance in their own interests.

k) Loan facilities without collateral

All banks in Bangladesh advance loan against collateral. Loan has to be taken after much paper work and hypothecation of property. But the landless labourer has nothing to mortgage. If they can get loan and capital they may undertake business. This was realized by Prof. M. Yunus of Chittagong University and he introduced the system of advancing loan with easy terms and without collateral through Grameen Bank.

l) Repayments are broken down into small instalments

To facilitate in repaying a larger loan, the arrangement of weekly instalments at the rate of 2% of the principal loan amount had been made compulsory. This helps in the development of a habit of loan repayment and at the time relieves the borrowers from the strain of repaying a large sum in one lump which is often not possible for a poor person who is in constant allurements instigated by the pressure of his multifarious basic needs to spend the cash he saves.

m) Organizational Structure of Grameen Bank

Various activities of the Bank are organized and implemented by four tiers of administrative set-up, branch office, area office, zonal office and head office.

The branch office is the lowest operation unit of GB. It is located in a village. It selects and organizes the target clienteles, supervises credit operations and recommends sanction of loans. An area office supervises about 10 to 15 branch offices. Assisted by programme officers, the area manager sanctions loans and supervises loan utilization and recovery them. An area office is generally situated in a small town. The area

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manager works under the supervision of the zonal office which is located in the district headquarters. Zonal manager supervise about 10 to 12 area offices. The head office is situated in Dhaka City. The head office primarily maintains liaison with the government and other agencies provides general guidance and feed back to the lower units of the Bank.

n) Group Fund and other Funds

Prior to recognition of the group, the members have to save Tk. 5/day during the 7- day continuous training. After recognition of the group, the five members of the group open joint account in the Bank with Tk. 35/- This fund is called group fund. After this, at the weekly meeting Tk. 5/- has to be deposited with the instalment which is deposited in the group fund. At the time of receipt of the loan, 5% is deducted and deposited in group fund. This is known as Group-Tax-1/. Loan may be taken from group fund on easy terms. While borrowing from group fund, 5% is to be deposited in group fund. This is called Group Tax-2. In this way the group fund is gradually increased.

o) The different sectors of GB loans

The economy of Bangladesh is mainly agrarian. About 48% of its GDP originate from the agricultural sector. As the economy grows, the non-farm activities also gain momentum. Thus, the rural non-farm sector has one of the highest potentials for raising income and generating employment for the large number of unemployed and underemployed rural work force. Rural non-farm activities generally consist of the provision of consumer goods and service for local markets including manufactured goods, processing and transportation of agricultural commodities, manufacture of a wide range of handicrafts or goods produced by the artisans who have inherited their skills from their ancestors. As a rural bank GB naturally is mandated to finance the whole range of activities, schemes or items on which its target clienteles are dependent for their livelihood. For the purpose of simplicity, GB`s range of financing has been classified into eight major categories.

These are: Processing and manufacturing, agricultural and forestry, livestock and fisheries, services, trading, paddling, shop keeping and collective enterprises. Of the total loan disbursement by Grameen Bank in the productive sector and income earning activities, the category-wise loans are as under (up to end of 2012).

Category	% of the total
Processing and Manufacturing	23.42%
Agricultural and Forestry	15.61%
Livestock and Fisheries	36.90%
Services	1.59%
Trading	16.27%
Paddling	0.96%
Shop keeping	4.46%
Collective enterprises	0.82%
Total	100%

Source: Grameen Bank Annual Report (2012).

It will be seen from the above figures that the Processing and Manufacturing, Livestock and Fisheries and Trading categories comprise about 77.7% of the loans advanced by GB. Under the Processing and Manufacturing category, the rural artisan and the people who basically live on the skills acquired from their ancestors, are financed by the bank. Since Grameen Bank`s loans are given for any income generating activity, and the loans are very small, the idea of projects or schemes, while conceiving a loan or a loanee, may mislead a financier. GB always views its loans as means to gain command of resources. With its effective use a poor person converts his latent skills in to generating an income for himself to reverse the age old vicious circle of `low income, low savings, low investment into an expanding circle of `low income, credit, investment, more income, savings, more investment, savings, more investment and so on'. On this hypothesis, Professor M. Yunus asserted that ``the more credit one can receive, the more resources he can command, the more powerful he is. Credit creates entitlement to resources. In a given society if one can find out who is enjoying how much credit, it would be easy to predict the socio-economic configuration for tomorrow``(Yunus, 2002). Thus, GB finances activities and not projects or schemes as such. The recipient will oversee the relevant activity 'to be properly and skilfully performed to generate income for him or her. In this approach the people who are targeted by GB have the options to borrow for any legal purpose, be it related to irrigation for food production, raising poultry or purchasing a rickshaw or a pair of milch cows, husking paddy, engaging in pottery or cane works etc. He or she is the person to make the selection based on her skills and capacity to invest and keep control over the different variables in the process of using the bank loans. The innovativeness of these people is enormous. Up to the end of June 2013, the GB borrowers have taken an amount of $10 billion fo about 665 different income generating activities (Grameen Bank Monthly Report, June, 2013).

p) Grameen Bank Years' named and programs

Grameen Bank has passed ten years in 1993 since its establishment as an institution on Oct.3, 1983.

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Founder of the Bank Muhammad Yunus has named each of the year as follows:

1984	Year of foundation lying
1985	Year of gathering strength
1986	Year of achieving qualitative strength
1987	Year of maturity
1988	Year of confidence
1989	Year of new horizon
1990	Year of arduousness
1991	Year of consolidation
1992	Year of reorganization
1993	Year of certainty

As each year comes with a new name, the workers of the bank in the light of new experience are devoting themselves to implement newer programmes without keeping themselves within the traditional programmes. The programmes and rules and regulation of 1983 have under gone significant changes in 2002 and later with addition, deletions and refinement. The bank has been enriched with new programmes. The programmes undertaken by the bank were aimed at welfare of the members. And these programmes have been adopted to meet the timely demand of the members. There is no scope of rigid programme.

The bank officials sensing the requirements of the members have come forward with timely programmes.

The programmes taken in hand by the bank for benefit of the members are as follows:

General loan; group fund loan; house building loan; basic house building loan; setting up of disaster fund; provision of grant from Central Emergency Fund to members of the family when a member dies; Grameen Pension Scheme (GPS); facility to each member of becoming a share holder of the bank; making of poles and their distribution; construction of slab latrine and their distribution; distribution of vegetables seeds, distribution of saplings, distribution of water purification, material, establishment of centre school and distribution of textbooks free of cost, establishment of children welfare fund.

The Bank also conducted sessions on sixteen decisions campaigns, women workshops (7 days, 1 day, regional, national and guardian). It organizes exchange visit among borrowers. It provides seasonal loan, family loan, collective loan, and capital restructuring loan, establishment of disaster fund, establishment of full group, distribution of saline, and distribution of Iodized Salt. The bank elects its Board members from the members. Grameen Bank organize training on health programme, training of birth attendants, vaccination programme, vaccination of poultry and animals, maternity and child welfare, anniversary. The bank conducts sessions on community forestation, sericulture, Grameen Chek fabrics, fisheries group formation, farmers group formation, deposit banking, distribution of hand tube wells, distribution of traddle pump. It provides orientation on raring and distribution of goats, raising baby chicks, baby Thai-camble ducks. Grameen Bank program like distribution of anti-goitre iodized salt is popular in Bangladesh. GB is flexible (even postpone) realization of instalments by declaring disaster area in times of flood, drought, earthquake and famine, realization of bad debt, realization of token instalments from those borrows who became irregular for not paying instalment for long. GB also campaigns for dowry less marriage and planned family. The bank has provision of loan release or mortgaged land, education loan for continuation of education, beekeeping, adult education, religious education center school, loan for medical treatment and rural afforestation.

VIII. Discussion of Findings

a) 98% female members/borrows of Grameen Bank

It is observed that in the context of Bangladesh, women are only treated as object of enjoyment for males. They have been engaged in cooking, bringing up children. Their role in the development of family or family members, in the development of children, family decision, leadership of society, earnings have been very little. Everything is done by males. By keeping within the four walls of the house her mental frame, creative faculty and everything have been crippled.

Grameen Bank experience has revealed that the role of women in the family is most important. Women play major role in the development of her children. She is more careful. Experience also showed that women save more. They are more prompt in repayment of loan. And so Dr. Joyonta Kumar Roy (1987) of India has said that the female borrowers of Grameen Bank may attract the attention of any researcher. Grameen bank has created the sense of self respect and leadership. For instance, divorced woman with Grameen bank loan has sense of self respect and leadership. For instance, divorced woman with Grameen bank loan has improved her financial condition so much that her husband out of greed proposed reunion with her. As Dr. Prof. M. Yunus commented there is no such work which the women don't know or don't do. The skills she develops through different activities in the family can very well be utilized for earning of income. He also observed that we have forgotten that women are also part of the labour force. It has to be remembered by all. In order to understand the real social picture of Bangladesh, it has to be seen from the experience of rural women especially poor women. Dr. Muhammad Yunus further has observed: during the days of scarcity the husband also disappears. The father may disappear to avoid facing the starving children, but the mother cannot. The mother tries to the last moment to feed the hungry children. The way poor woman has to brave poverty throughout her life, no one

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else has to do so. The way poverty crushes a women, it does not do so to a man. Grameen Bank experience shows that the way a women grabs the minimum opportunity to remove poverty; a poor man does not do so. And so getting the opportunity of getting loan on easy terms and without collateral 98% women borrowers of the bank have repaid 99% of their debt. Yunus thinks that poverty alleviation effort should proceed through women.

b) Bank Assistants in the centre meeting not only collects loan instalments but they spend more time on discussion for development of the members

The members do not have to go to the Bank to pay loan instalments or deposit their savings. Rather the Assistants of the Bank go to the centre near the house of the members and collects loan instalments between 7:00 -8:30 in the morning on week days. Through instalments are collected in the meetings, the Bank assistants and Managers spend more time on discussing the different ways and means of improving the standard of life of the members. They exchange views on different aspects of the problems of the members. If there is any problem of the Centre, they discuss how to resolve those problems. They also exchange ideas about how to fruitfully implement the programmes taken up by members. They take steps to strengthening a weak member. It has been observed that the staff at branch level fix up 52 subjects of discussion in 52 weeks and discuss them in the centre meeting according to their appropriateness on prepared materials. Besides, the Bank Assistants ascertain the problems in the centre meetings and take measures to resolve them through the members. If the office staff and centre members cannot resolve the problem, the Manager and other staff try to find solution to the problems. They also try to solve the problems of the problem raised center in cooperation with neighbouring centres. Bank Assistants decides the subjects' matter of discussion according to the life span of the centre. That is, subject matter of less than a year old centre is not same as 8-9 year old centre. Experience has shown that older centres are more expert in resolving problems that the younger ones. Centre integration is very strong for older centres. They are able to earn more. They are more courageous in facing disaster.

c) Members are owner of Grammen Bank

It was impossible in the context of Bangladesh that poor people especially poor women will earn income through business by taking loan from bank without collateral and invest money. Moreover, it was unimaginable that poor people can become owner of the bank through purchase of shares. But Grameen Bank has given it a reality. Every member of Grameen Bank has become owner of the bank through purchase of share. Out of 13 members of Board of Directors of the Bank, 9 are women members of the Board and all of them participate in decision making in respect of policies and rules and regulations of the Bank. They review the income, expenditure, profit/loss of the bank for each year and approve the programmes and budget for the next year. After recognition of the group, every male/female member buys 100-Taka share and becomes a share holder of the bank. They consider themselves lucky to think that they have become owner of the bank through purchase of share. They have decoded they were one soul with the bank and share the benefits and sorrows of the bank. They are in one soul with the group and centre and all staffs of the bank and share its prosperity and development.

The rich people are envious and express indignation at the opportunities enjoyed by the poor people. They try to divide the members. But social and mental unity of the members have grown so much that it became impossible to make any break. Failing to do so, they are now being invited to the rich society in their meeting, arbitrations and give them opportunity to express their views. They cannot ignore the views and decisions of the landless; rather they are compelled to accept them.

If there are problems or disputes among the members, members of the centre resolve them. If necessary, Bank assistants offer them assistance. The members feel that they are joint owner of Grameen Bank. They are in unison on the ideals of Grameen Bank and support it in a body.

d) Role of members and Bank in facing calamity

The house and property of the members are adversely affected by natural calamities like flood, drought, cyclone, tidal bore and business capital is lost. Extensive damage is caused to crops. The unprecedented floods of 1987 and 1988 had destroyed the houses, crops, cattle and other assets of the people. For want of shelter many people, cattle and poultry died. People became discouraged at the loss of property and belongings but 'Grameen Bank' members did not lose their morale and initiative. During those dreadful days their slogans were:

(1) "We are not afraid of flood and drought
We shall not leave Grameen Bank."

(2) "Whatever may be flood and draught
We shall not leave centre."

Offices and staff of all levels of Grameen Bank took many programmes to save them. These are discussed below:

- Transported the affected persons to shelter at flood free higher places by shallow engine boats, makeshift boats made of banana plants
- Distributed at the shelters water purification tablets, dry foods like puffed rice, biscuit, saline packets
- Doctors admitted the seriously ill persons into hospitals

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- Supplied to the shelters carbolic acid and other indigenous medicines to protect them from snakes and poisonous insects
- Declared calamity area and postponed realization of instalments and centre meetings
- Established disaster fund and supplied quickly food, medicine, ORS Saline, water purifying tablets, Alums, Iodized Salt and clothing and quilts
- Bank personnel regularly enquired about the welfare of the members in the shelters and take care of them
- Buried and dead and provide benevolent services to the death person family
- Assisted the members to return to their houses speedily as soon as flood water receded and cleaning of stranded water and rubbish
- Provided special loans quickly to recover capital
- Provided maintenance loan for food
- Distributed wheat, corn, mustard and vegetable seeds
- Provided loan for fertilizer and irrigation
- Provided loan for basic construction materials and purchase of homesteads
- Supplied construction materials quickly
- Prepared statement of loss and took necessary measures accordingly.

With assistance from the bank personnel, the members faced the calamity with courage and made up their loss. The Bank announced postponement of realization of instalments for 3-4 weeks after the flood. When there was shortfall of money in branches of local commercial banks, the staff of Grameen Bank Area Offices located in the districts at the risk of their life carried cash hiding in the side covers of motor cycles or under the seats of Baby cabs and delivered the money to various branches. Each day in each branch loan was distributed to 500-6000 members. Bank assistants worked hard round the clock for three months after the flood to rehabilitate the members. As a result, the members were able to rehabilitate themselves. Non-members of the area had to meet their requirements by disposing of their land and homesteads. But through the grace of God, Grameen Bank members had not to do so. Through shanty houses were badly affected by flood, they could rebuild new tin shed houses with Grameen Bank assistance. As Grameen Bank personnel were beside them, they kept up their morale and courage in the face of the catastrophic disaster. They did not feel despair; rather they faced the disaster with courage.

Experience of Tangail showed that the pre-flood irregular centres and irregular debtors being impressed by prompt actions of Grameen Bank during the time of disaster admitted their mistake and came back to Grameen Bank for assistance again. The centre became active again. The defaulting members became regular again and made their life normal.

During acute scarcity of flood in the months of March, April, and May of 1989, Grameen Bank postponed repayment of instalments by members introduced maintenance loan and 100% loan from group fund. Grameen Bank arranged to distribute rice, wheat, flour, parched rice, molasses, and biscuit. Grameen Bank stood by their members during the dreadful tidal bore of 1990 and rendered similar assistance to them. The Bank also came forward to rehabilitate the members affected by the floods of 1992-1993 in Sylhet, Chittagong and Rangpur.

e) Members getting more opportunity to be associated with agricultural production

Groups are formed with those landless men and women who have less than .50 dec. land and Grameen Bank provides them loan for implementation of other programmes. The members by investing their loan money in business earn profit and create some asset each year. They have more interest in two types of assets, first semi-pucca house with strong galvanized iron sheet and second, purchase a piece of land if they find an opportunity. If a survey is conducted, it will be evident that about 50% of 4/5 years loan receivers have purchased some property mainly homestead land and or crop land. In the homestead land, they have planted strong and long life fruit plants, cultivated vegetables. In crop land, they have planted paddy, wheat, different types of pulses. Not only, had most members planted crops on leased land or share-cropped land. With the help of the produced crop, they can not only buy consumable but also invest to expand their business. From the business income, besides repayment of loan, they are adding to their savings, supplementing capital and defraying expenses of children's clothing and education.

Following the introduction of seasonal loan, members can take this loan for planting crop according to need. As a result, they can participate in non-rice production and supplement their income. With the help of seasonal loan, they are planting sugarcane, corn, soybean, banana, papaya, vegetables. Members can also take individual or joint loan to purchase traddle pump, power tiller, shallow tube-well, thrasher machine and use these machines for cultivation, irrigation and processing of crops. As a result the rural economy is being revitalized. There are revolutionary changes in firm production.

f) Appropriate contextual strategies bring Grameen Bank success in Bangladesh

i. *Implementation strategies*

At the beginning this pilot project had no formal organizational structure and procedures for delivering

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loans to poor people. The Grameen Bank project developed its implementation strategies, working methodology, and credit delivery mechanisms in the course of time. All credit delivery technologies were developed during its operation. GB made many learnings during its establishment. However, GB policies, implementation strategies, credit delivery and recovery mechanisms and other parameters are in a continual process of development and change to fulfill borrowers' needs and demands through situational analysis and a bottom up approach. It is obvious that rigidity in policies and guidelines have no place in GB.

ii. *Monitoring and Information System (MIS)*

GB is more concern with calculating its vision and maintaining its organizational culture. Its' management has some motivational devices to ensure targeted performances. Grameen uses its management information system (MIS) to generate information for decision making and to disseminate information back to lower level staff so that they can systematize their own performance. This MIS system has grown from field experience and that allows managers and field staffs to track accomplishments.

Best Practices Parameters. GB developed some parameters that are keys to the success of its objectives. These parameters are properly included in the operational structure at all levels and can be readjusted to the various needs of the poor in order to eradicate poverty. The GB target group is exclusively rural poor women. Its loan operations follow group lending methodology. It places special attention to and adapts community participation approaches to empower women. Loan appraisals and planning are conducted in the weekly centre meetings through mutual discussions and observance; not by complicated paper work or financial and marketing analysis. Groups are composed of five poor women of similar socio-economic backgrounds, from the same village. Six groups make one center in a neighbourhood/village. Borrowers themselves select their group members, but GB staff screen and verify members' portfolio backgrounds to ensure that they are indeed the poorest of the poor. This group formation system helps to maintain a homogeneous setting, in which clients can interact freely with each other. Nonetheless, strict credit discipline and close supervision is in place to guide each borrower towards proper control of loans.

Unique practices of Grameen Bank and its impact in the society. To maintain equal opportunity and to address issues of participatory management, democracy and empowerment to all members of Grameen, the positions of Centre Chief, Group Chairman, and Group Secretary change every year. By this process all members of the center get a chance to be Center Chief, Group Chairman, and Group Secretary by rotation. This practice helps to enhance leadership qualities and decision making skills in all members. In addition, this practice of rotating leaders adds to a decentralized power structure and holds each member accountable to the other within the center. These tools are essential to the efficient operation of the credit program including avoiding inequalities and maintaining corruption free loan transactions. These unique practices of the Grameen Bank start from making annual action plans at the field level. Branch managers set up some performance indicators like loan disbursements, loan repayment, group savings, and attendance in the centre meetings of borrowers and borrowers' wealth creation by loan utilization etc. These parameters track the viability of the branch performances. The Branch maintains all loans and other such related documents. Its performance is ensured by GB internal audit department. This internal auditing process enhances the leakage free credit delivery system.

The entire GB credit operation operates through a system of close supervision. There is an in-service training program in GB for its staff training. This practical training helps staff to be committed and to work for the poor as a cohesive team. There are no intermediaries between clients and the bank at the grass roots level. GB charges 20% interest on its general loans. There is no subsidy at any stage of the credit operation.

The simple, straight-forward program designed for loan proposals through mutual discussions among center members ensures diversified loan disbursements to its clients. All transactions are conducted within centre meetings and are intensively monitored. It ensures mutual accountability through a peer support mechanism. No information is kept secret, so there is no scope for corruption, misappropriation or irregularities. These strategies further contribute to the successful operations of the Grameen Bank. Micro finance other agencies/industries follow GB simple strategies to implement at their locations and situations.

iii. *Impact of micro credit*

The microfinance industry is going through a period of rapid scaling up in Bangladesh and in other countries. The Grameen Bank group lending system has been widely replicated in other developing countries. Bank Rakyat in Indonesia and Banco Sol in Bolivia, CADRO Philippines, Bandhan India has worked to improve the effectiveness of efforts at reducing poverty, that fall under the broad rubric of 'community driven development' (CDD). Access to micro credit indeed empowers poor people, provides them the opportunity to have an account, to save and invest in small business. Microfinance offers potential advantages to all stakeholders viz., the poor, the non-governmental organisations (NGOs) and the banks (Copestake et al., 2005; Hulme & Mosley, 1996; Khandker, 2005; Morduch & Haley, 2002; Yunus, 2002).

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Recent literature has found a positive correlation between access to finance, economic growth and poverty alleviation. The provision of microfinance has been found to strengthen crisis-coping mechanisms, diversify income-earning sources, build assets and improve the status of women (Montgomery et al., 1996; Morduch, 1998). One of the first comparative studies addressing effects of microfinance using quasi-experiments was made by Hulme and Mosley's (1996) in his study 'Finance against Poverty', bringing a new critical voice to the debate by showing the limitations of microfinance in bringing about poverty alleviation. Some of the studies indicate that it has made better off poor rather than retain them poor (Copestake et al., 2005; Hulme & Mosley, 1996).

Moreover, Shahid Khandker (2005) finds in his study in Bangladesh that the extremely poor benefit more from microfinance than the moderately poor. Moreover, a study conducted in India by Small Industry Development Bank of India (SIDBI) (2008) mentions that 76 percent of the poor were able to increase their income through MFI assistance, and 77 per cent could provide better educational facilities to their children. Likewise the micro credit impact survey on poverty reduction is also reviewed by Morduch and Haley (2002) in India, and Khandker (2005) in Bangladesh. Both studies find the same results. They have found a greater impact on poverty for low-income households. Moreover, Richard Meyer (2001) observes that microfinance can contribute to poverty alleviation and empower bottom people. These tremendous positive economic and social developments have achieved through supplying micro loans, savings and other financial services by MFIs that enhance investment, reduce the cost of self-insurance, and contribute to poor people consumption smoothing.

Participation in micro enterprise services leads to an increase in the level of household income (Chen & Snodgrass, 1999). According to Chen & Snodgrass (1999) study in India, the average income of borrower households of SHGs is higher (by 39%) than the average for non- member households in the SGH project area. Further, they have observed that participation in micro enterprise services leads to an increase in expenditures on food, especially among the very poor. Moreover, they (Khandaker, 2005 and Chen & Snodgrass, 1999) find that microfinance has made incredible progress in Bangladesh and in India over a period of years. Micro credit program has become popular and familiar to the poor these countries as they view benefits reaped/receivable from microfinance services in their life.

It is generally felt that there have been perceptible changes in the living conditions of the rural poor mainly on economic side and relatively on social side owing to the role of Grameen Bank. In addition, it is widely believed that Grameen Bank has a positive impact on the poverty levels and standards of living of the poor and more particularly on the economic empowerment of women in Bangladesh. However, these tremendous achievements have achieved because GB Bangladesh and Self-Help Group (SGH) India organizations are built/developed with strong management capacity. MFIs organizations in different countries have solid foundational relationship with their clients.

g) Replication of Grameen Bank Model

The Grameen credit program is widely accepted as a tool for poverty reduction. It attracts the attention of all development experts, researchers, universities, executives, policy makers and donors as a micro credit success story in Bangladesh for addressing poverty. Different countries have used Grameen credit experiences to replicate similar practices in their own cultural contexts. The Grameen micro credit model has been replicated worldwide since 1993. Now 98 countries follow GB group lending model but they adjust their ending programs to their local context, culture, values and norms (Latifee, 2002: p.51).

The Global Micro Credit Summits of 1997, 2002, 2006 and 2011 have helped to draw the attention of policy makers and practitioners' worldwide. Different international organizations like UNDP, UNHCR, UNICEF, ILO, CIDA, SIDA, USAID and several countries included the micro financing program in their policies to address poverty and to promote micro enterprises among micro-entrepreneurs. All projects that were modeled on the GB reported loan repayment rates of more than 99%. The micro finance institutions (MFIs) initiators are trying to cover their cost of operation from their interest income. For example, Activist for Social Alternatives (ASA), Tamil Nadu, India, SHARE, Andrapradesh, India, CARD in the Philippines and NIRDHAN in Nepal, have their own banks to serve the poor (Latifee, 2002). The Grameen Bank Replication Program (GBRP) has set up a website that also helps people get information about its programs. The GB web site address is www.grameen.com/grameen/gtrust.

h) Facilitating factors for implementation of practice

The operational tools of GB which include projection meetings to plan for the program, direct contact with clients mini meetings, rigorous training on group formation, weekly meetings and group screenings ensures that all clients have equal opportunities to participate in decision making. These tools add to the successful implementation of the GB programs throughout Bangladesh.

GB is not a centralized decision-making organization. Management functions and decision-making powers are continuously being delegated to the branch offices to improve their managerial skills as well as to get grass roots information to hierarchal upper

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levels in area, zonal and head offices. This feedback loop involving head offices, zonal offices, area offices and branch offices enhances organizational management; decision making processes and improves program activities. Prompt responses to field problems by supervising officers are characteristic of Grameen administration.

GB mobilizes its staff to be enthusiastic to do their assigned GB jobs by awarding them star staff and five star branches. Those who achieve star criteria receive appreciation letters from Professor M. Yunus, monetary compensation, promotions, and opportunities to travel and conduct assignments abroad. A Grameen Bank Staff proudly displays his star on formal occasions. These awards encourage competition and help inspire field staff to be more active in their work for the poor.

GB has faced many problems during its operation. These have come in the form of bureaucratic influence from the government, income disruption to borrowers as a result of natural disasters like flood, cyclones and river devastation. Overlapping with other credit institutions, opposition by religious leaders and local money lenders, and political crises are also hampers to loan operations. These problems have impacted upon borrowers' income as well as loan repayment. Delinquent loans portfolios increased. GB field staffs are polite, patient, and respectful to borrowers but strive to maintain credit discipline. GB staff may become disappointed but they are never disheartened about negative results. Both the head and zonal offices monitor field activities and lend constant support to their staff.

GB had served borrowers an approximate 6.8 million rural poor in 35 years in August 2002; however, it has increased its client's services to about 8.8 million in June 2012 (Grameen Bank Monthly Report June 2012). This has been a huge increase within ten years. This rapid expansion poses added challenges to GB to maintain quality service to its borrowers. GB confirms this information as of December 2013 latest information reports that it has 8.8 million borrowers (Grameen Bank at a Glance 2013). Still GB loan functions well. Its repayment rate is still 99%. GB offers loans to poor people for small businesses; however, it does not provide any training/orientation on small business management, marketing, loans management and book keepings that are very essential for businesses.

i) Compare GB activities with its two other sister organizations Grameen Chek and Grameren Krishi Foundation (GKF)

GB has created twenty seven sister organizations. Here the author describes two of them: (1) Grameen Check-is producing handloom fabrics, manufacturing garments and marketing them nationally and internationally. It runs its own business by mobilizing funds internally. It covers it's costs from its revenue; (2) Grameen Krishi Foundation (GKF) - it involves in agricultural irrigation farming, crops production and crops marketing in Bangladesh. It is working with marginalized farmers in the villages. GKF receives grants from US-Aid, UNCDF and Dutch government.

i. *Grameen Chek*

The Grameen Check has recently introduced a new programme called handloom manufacturing fabrics-Grameen Chek. Under this programme, Grameen Chek supplies yarn to the handloom weavers and purchase the produced cloth from them. And have taken the initiative to market the product. The Grameen Chek cloths are superior to Indian Madras Chek fabrics and being cheap, the local garment industries have shown interest to purchase the Grameeen Chek fabrics (Grameen Chek Annual Report, 2010).

As a result of introduction of Grameen Chek programme, the dying handloom industry has been re-established in Bangladesh. As the output of handloom was unprofitable and unproductive with cloth produced in textile mills, many weavers closed their business, took other profession or became unemployed and were living miserable life after selling their belongings. These handloom weavers under the Grameen Chek programme get supplies of yarn and get rid of risk of marketing of the produced cloth, hence they are taking up this profession again. Many handloom weavers in Pubna, Sirajgong, Bogra, Tangail, and Dhaka zones have found a new avenue of income through Grameen Chek programme.

Grameen Chek fabrics are not inferior to Madras Chek. The Grameen Chek fabrics and garments are not only used in local garment industry, but they are exporting abroad for use in the garment factories of Sri Lanka, Middle East, and even in India (Granmeen Chek Annual report, 2010). In this context Muhammad Yunus has recently stated that if the inflow of Madras Chek is stopped in Bangladesh, the weavers of Bangladesh will get order for Tk. 2 Billion per year (Grameen Bank Annual Report, 2010).

j) Grameen Krishi (Agricultural) Foundation (GKF)

GKF is a sister organization of Grameen Bank in Bangladesh was establish in 1991. The GKF top management is composed with grameen personnel deputed from Grameen Bank to GKF. The author is one of them had worked in this project seconded from Grameen Bank for seven years. GKF had made agreement with Bangladesh Agricultural Development Corporation (BADC) and Bangladesh Water Development Board (BWDB) to take over the management 2500 Deep Tubewells that are located in northern districts of Bangladesh. The government of Bangladesh had run these deep tube wells by receiving

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funding from the Asian Development Bank and Saudi Development Fund during 1975-1990. However, the Government of Bangladesh handed these tube wells to GKF for better irrigation service to farmers.

As mentioned earlier, GKF was funded by three donor agencies: UNCDF, USAID and the Royal Government of Netherlands, each of which granted seven million dollars totaling 21 million dollars for managing this irrigation project from 1992-1995 on the basis that these were operated commercially.

With donor funds, GKF gradually expanded its activities to crop diversification like fish cultivation alongside rice, and raising hybrid livestock, and fish cultivation. It introduced modern agricultural technologies at the farm level to increase crop production with an integrated farming approach and encouraged the cultivation of integrated farming system. It introduced hybrid maize, soybean, wheat and sugarcane in its project area. It also started implementing the projects of buried pipes for irrigation, seeds production for various crops, biotechnology and many other modern agricultural technologies for increasing agricultural production in Bangladesh.

All these programs were designed by the western irrigation management expert hired by the donor agencies (UNCDF, USAID and the Royal Netherlands Government). They have prescribed programs to GKF without considering the local socio economic, geo-agricultural and environmental factors. The feasibility study, project formulation report, inception mission, appraisal report and the review mission report all were prepared by donor consultants who came from US, UK, and Netherlands. The GKF personnel followed the project formulation guide lines that prescribed for tube wells' irrigation management, but their guidelines were idealistic and lacked practicality. As a result, these guidelines did not fit in the farm and hence GKF was unable to run its DTWs commercially.

Every year a review mission appointed by the donors visited Bangladesh to review GKF activities. GKF staffs had no agricultural and DTWs irrigation management experience, but they were very hard working. A local consulting firm named Kranti Associates Ltd. was recruited to provide technical assistance to GKF. The local consulting team members were from Bangladesh Agricultural Research Institutes (BARI) and from Bangladesh Agricultural University, who had limited agricultural extension implementation skills and experience. The local consulting team gave suggestions to GKF. GKF was bound to follow consultants' recommendations as the release of donor funds depended on review mission's report. Therefore, GKF staffs were busier to prepare and provide quarterly performance report and account reports. They always referred to the appraisal reports in their review mission. The author noticed that consultants' suggestions and conditions imposed on GKF by the consultants were impossible to implement. For example, consultants bound GKF to test their diverse ideas in GKF farms like increasing DTWs command area, reducing irrigation costs, and introducing new crops in the farms, which was practically impossible although GKF tried hard to achieve. Even though GKF staffs worked hard and worked with honesty, they failed to run DTWs on profit basis. The main reasons are stated below:

1. GKF operates the farms with farmers on partnership basis. GKF provides irrigation water and inputs like fertilizers and seeds along with the technical back-up. The farmers share the responsibility of cultivating their lands; invest labor for crop production, and harvesting. GKF receives one third of the crops for its irrigation services and 40% for irrigation and other input costs. A huge overhead structure was made for smooth functioning of these DTWs' farms. The overhead costs of GKF were 25% of its total operational costs. Per farm overhead costs was BDT 27, 000, but GKF was unable to recover its overhead costs and DTWs operational costs from its share cropping. The consulting fee was five million dollars approximately. These fees also increase overhead costs of GKF.

   Moreover, staffs were over burdened with workloads to maintain records of farm activities, and farm wise data base information, statistical reports and accounts they were required to supply to donors and consultants. Hence management information system (MIS) and accounting costs were huge.
2. Although per acre rice production increased in GKF farms, as new crops like hybrid maize, soybean, sugarcane and HYV rice were introduced in GKF farms, introduced new agricultural technologies, and barren lands were cultivated. Farmers benefited greatly from GKF. Although it had created dynamism in the local economy; however, GKF could not sustain and expand its activities all over Bangladesh as it had to incur loss in every year. For example, GKF made a negative balance of total BDT 117.0 million in 1993-1994. Total expenditure was BDT 234.0 million, net income was BDT 117.0 million (GKF annual report 93-94, p.41). In 1993-94 total operated DTWs were 807. And per farm loss was BDT 92,000. The income per taka expenditure was BDT 0.46. So it ended up in a huge loss Tk 1300, 00,000 (Grameen Krishi Foundation Annual Report 1994).
3. The project inception report mentioned that DTWs crop production command area should be 100 acres, but in practice GKF had a meagre command irrigation area, of 57 acres (GKF annual report, 93-94: p.16). GKF was unable to make enough income from poor coverage area whereas the overhead

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costs were same for lesser command area. Government did not provide subsidy to cover farm loss although GKF is managing public deep tube wells (DTWs).

4. Bangladesh Agricultural Development Corporation (BADC) and Bangladesh Water Development Board (BWDB) did not operate these DTWs because these DTWs were located in the less fertile soils area that consume more water in that area. Moreover, there is also the problem of frequent power failure. As a result GKF operated DTWs operating costs were high (Grameen Krishi Foundation 1994).
5. Maize is a new crop for Bangladesh. There is no maize flour processing industries there. GKF was in trouble in marketing them. Hence GKF had to sell maize, soybeans and sugarcanes with lesser prices than its production costs.
6. Many DTWs were diesel operated machines. Pumps break down were frequent. Machine spare parts were not available in the local market. So spare parts were being imported from UK, India, Italy and US, which was time consuming and expensive. As one third of the DTWs were electrically operated, frequent power loss had disturbed pumping water irrigation during dry sessions.
7. Seed production costs did not cover its selling costs.
8. Buried pipe irrigation was very technical and costs were huge. Local farmers were unable to manage it properly.
9. GKF brought tractors, trailers, lories, cars, power tillers, harvesting machines, electric motors, different crop processing machines, and other modern machines which increased the project implementation costs. Many mechanics had complex operating procedures and were not suitable for Bangladesh as the lands are overly fragmented. Plough through tractors was also not suitable as lands are small and fragmented. Farmers were unwilling to use these unfamiliar machines. Big harvesting machines were not working in small lands. Therefore, many machines brought by GKF as per the prescription of the consultants remained unused, although the fixed costs for these machines were BDT 95.0 million (Grameen Krishi Foundation, 1994).
10. GKF had a crisis of agriculturally skilled manpower at all levels. GKF managing director, regional managers, unit managers, and farm workers were unable to argue with foreign academic experts and were unable to challenge to consultants' DTW operational guidelines as they had no academic background in either agriculture or irrigation.
11. Cost of production of maize, sugarcane, soybeans, and banana occurred very high in many farms. Moreover, farmers were unwilling in cultivating unfamiliar crops other than Boro paddy in light soil. In the same area, Government subsidized BWDB operated many DTWs around GKF project area and charged lesser fees than GKF water fee. Therefore, it created a huge local conflict among farmers and in some places the farmers resort to non-cooperation to escape arrear crop share payment. However, donors did not consider it in their project documents.

Although GKF demonstrated higher production in various crops, introduced and tested various agricultural technologies at the farm level through a community participation approach and made positive impact in local economy; however, it was unable to make a profit from its operation (Grameen Krishi Foundation 1994). As mentioned earlier, lastly GKF ends up with huge loss in 2002 and GKF was unable to continue to run all its DTWs. It curtailed and reduced its expansion after the donor funds were stopped. Therefore, GKF needs subsidies in order to run DTWs in Bangladesh; however government close its support to GKF. The experience of GKF in agricultural development in Bangladesh is very significant. Although the organization has created awareness among farmers and agriculturalists about the commercial approach to farming, cost recovery from share cropping income system was not successful in GKF. However, GKF, during its operation, made agricultural farm management more dynamic. In addition, it drew the attention of various institutions from home and abroad thereby pioneering the implementation of innovative programs like hybrid maize cultivation, silage preparation and biogas plant installation in Bangladesh. It served as a 'Centre of Excellence' for technology demonstration and transfer (Grameen Krishi Foundation, 1994). Muhammed Yunus received `World Food Prize` Award in 1994 for GKF outstanding contribution to food production in Bangladesh. However, its sustainability ultimately depended on it being a viable program, which is a question of cost consciousness and fund management. Although GKF was able to manage this irrigation program for public wellbeing better than BADC and PDWB; however, it was unable to be a self-reliant and self-sustaining cost-recovery project in Bangladesh because it failed to make a profit per the conditions of its donors.

k) Discussion and findings of the study on Grameen Bank

Only investment of a poor man is not enough. Side by side they have to be counselled on loan utilization benefits, marketing and other aspects. Otherwise many poor men shall eat up the loan money. Before loan is sanctioned the receiver must have an idea about the objectives, ideals, loan transaction system.

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- *Time of loan disbursement and amount*

The amount of loan and the time of its disbursement play an important role. Loan must be available at the proper time needed by the borrowers. If the loan is made available at the time convenient to the institution, it may not be timely to the borrower. And if the loan is not available in time, it may not be any use to the borrowers. Therefore, there must be a consistency between the amount and objectives of the loan. If not, the loan cannot produce the desired result. Therefore, loan disbursement programme must be timely and consistent with the objectives of the loan. In this regard, the loan giving institution must understand the plan of the borrower and act accordingly.

- *Carefulness in group formation*

The group is the main framework of the bank. In this respect, the group members should be likeminded and preferably of same age group to maintain the dynamism of the group. If it is otherwise, there will be difference of opinion and indiscipline. Group and centre will be organizationally weak and it will not be possible to conduct the banking activities uninterrupted. Moreover, in the disbursement of loan more importance is to be given to group rather than to individual.

- *Impartially is an important element of loan sanctioning*

In the absence of impartiality, there will be negative reaction in the group and group discipline will be hampered. Subsequently individual will also be indiscipline. Thus, the organizational structure will be weak. GB should continue its service to its clients in future to keep its reputation.

- *Taking up of training programme*

Formation of group and age profile of group plays an important role in the banking programme. At the primary stage, group is fresh and less experienced and the members suffer from uncertainty. As the programme makes progress, there is maturity in the thinking of the group with the passage of time and members' self-confidence strengthens. In this situation, the group has to take new programmes and initiative to keep pace with time. Again, if any programme is taken before maturity, there is possibility of its failure. Therefore, programmes are to be taken keeping in mind the age of the group.

- *Productivity of loan*

Loan provided by the bank may be utilized in two ways. First is short-term investment and second is long term investment. However, Grameen Bank loan repayment system is weekly. So if any member needs long term loan, she or he should get it if she or he has other source of income. Otherwise, it has to be ensured that a portion of the proposed loan is to be used as regular source of income.

- *Credit and Development*

The road to socio-economic prosperity must be continuous process of creation of assets so that the asset base of an individual or a society becomes stronger at each economic cycle. This process of creation of assets can be accelerated with the support of credit. A poor person can convert his/her latent skill or in other words his/her survival skill into any economic activity, of course legal, with the aid of credit. When someone has an opportunity to acquire assets or borrow assets to use these for any benefit, he/she no longer stops dreaming. Credit thus creates hopes and also kindles ambition for a change. The experience of Grameen Bank testifies to this (Yunus, 2002). GB borrowers are now formally becomes a part in the development process. Members are small entrepreneurs, always busy reading the market signals, balancing the daily production and sales figures, procuring goods and services, attending the bank meetings, participating in family decision making sittings, etc. The tales of sorrows and deprivations are being slowly and gradually wiped out.

- *Emergency use of fund*

As mentioned earlier, Bank has created several funds to finance during calamities of members and there are certain rules and regulations in the management of this fund. If these rules are strictly applied it may not always be possible to use the fund in times of emergency. Therefore, in time of necessity and calamity, these rules may be relaxed and action taken accordingly. It has to be remembered that people is first, rules are secondary. If there is no people, rules are meaningless. Therefore, there should be provision for 100% utilization of the fund at the time of calamities.

- *Center meeting discussion*

At weekly centre meeting, Bank employees simultaneously do jobs with loan collection, discuss about utilization, supervision of loan and problem of the members. Even if these are discussed every week still the bank employees are bound by time. So it takes time to discuss about special problems and issues.

Besides, arrangements are made through mini workshops at intervals to get rid of monotony of weekly centre meetings and avoid traditional discussion. If the high officials of the bank are present in the workshops, they can take part in the discussion, in resolving problems and preparation of programmes which will strengthen members' morale. This will also strengthen and consolidate the foundation of the centre.

IX. Policy Implications

Micro credit empirical study analysis has revealed that microfinance particularly in the group based micro credit approach is most suited for sustainable rural economic development through the Tarticipation of the stakeholders at all levels in different

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countries. For example, Grameen Bank reduce poverty and vulnerability of the poor by increasing capital / asset formation at the household level, improving household, and enterprise incomes, enhancing the capacity of individuals and households to manage risk, increasing enterprise activity within households, expanding employment opportunities for the poor in non-farm enterprises, empowering women, and improving the accessibility of other financial services at the community level in Bangladesh. Moreover, the study observes that by strengthening women's participation in groups particularly of those belonging to socially deprived classes impacts significantly in providing full and productive employment for women in the society. It does not only empower disadvantaged women and other marginalized people, but also opens up more business opportunities for the private sector, stronger communities for society, and greater sustainable economic growth for countries. Therefore, evidences show MFIs are empowering marginalised people in Bangladesh and other countries. Moreover MFIs generate a smart economics-sustainable quick impact economy if they have proper micro loan implementation strategies, and policies that are suitable to local society and context.

X. Conclusions

Grameen Bank has not hired foreign consultants for its program design, program development, and program implementation. GB has developed its services directly taken experience from the field. It's staff contributed to its program design and program success in Bangladesh even bring it to world stage as a model for poverty eradication. The GB staff review problems by themselves and they solve problems based on local situations. The proposed solution is first tested in 2-3 branches for about 6 months on a pilot basis. Lessons are learned from them and then extended to other areas served by the bank.

Grameen Bank slogans that this bank is for the people, people are not for the bank. As mentioned earlier, Grameen Bank builds its own internal fund mobilization process (Grameen Bank 2002). Grameen Chek also stands and runs on its own revenues (Grameen Chek, 2010). These two organizations did not use external funds and external consultants. The field staffs bring their ideas to these organizations and these two organizations develop their policies, operational strategies, marketing strategies, accounting procedures and MIS devices. Conversely, as mentioned earlier, Grameen Krishi Foundation (GKF) receives external grants. The donor consultants compel GKF to accept their terms of reference to run GKF farms. Even donors inception reports forced GKF follow their action plans. Although GKF protested against donors` inception report and consultants advice; however, donors forced GKF to follow armchair external consultants' directions. The author involves with all these three organizations in their program designs and implementations.

The author praxis researches on social economy and micro economics development using his academia-sociology, ecological economics; program planning and management; community development; small business management; and environmental development and his working experience in different countries. The author has similar experience like many other researchers (Arnove & Torres, '2007; Bray, 2003, 1999; Leys, 1995; Manion, 2012; Noveli, 2010; Samoff, 2009, 2003) who have experienced-foreign donors impose conditionality while providing to grants to developing countries resulted failure of the programs. Many donor funded projects have negative experience on donors' control, apply coercive powers and privileges and their mismatching impositions to grant recipients that resulted failure the projects in different countries (Bary, 1999; Noveli, 2010; Samoff, 2009). Donor funded many evaluation studies mention the same failure story (Crosley & Watson, 2003; Noyes, 2005). Maximum reports identified failure causes are imposition of donors' ideas and their coercive control. The author also finds same experience donors control and influence GKF activities. The author struggles to follow donor consultants' advice and to follow their plan of action during his job in GKF. The author is unable to balance the GKF local situations and implement consultants' ideas. Therefore, there was a gap between consultant advice, grant allocation and implement the GKF activities for the benefit of marginalized farmers in Bangladesh. As GKF currently is not financially sustainable; hence it shrinks its operations and services in Bangladesh.

On the other hand, as mentioned earlier, Grameen Bank and Grameen Chek run without external grants, national and international consultants. The GB staff work hard for the well-being of GB clients. Moreover, Grameen Bank does not contribute to the philosophy that they should precede on unfaithfulness. Grameen Bank and Grameen Chek go to the doors of the individuals. This is the basic philosophy of Grameen Bank and is sister organization. One has to keep this always in mind and move forward when working with community people in any society. Not only provision of loan, in case of necessity, its effectiveness utilization has to be taught with practical demonstration that these organization are striving for. These community-based grameen organizations have played an effective role in creating individual initiatives. Thus the GB clients and Grameen Chek handloom weavers find ways to get rid of their miserable life. Their initiative and contributions generate life in the social and economic horizon in Bangladesh.

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Global Journal of Management and Business Research: B
Economics and Commerce
Volume 14 Issue 2 Version 1.0 Year 2014
Type: Double Blind Peer Reviewed International Research Journal
Publisher: Global Journals Inc. (USA)
Online ISSN: 2249-4588 & Print ISSN: 0975-5853

The Potential Consequences of Food Securtiy, Health Security, Income Inequality, and Eduation for the Average Level of National Intelligence

By William R Dipietro

Abstract- This paper uses cross country regression analysis to try to explain the variation in cross country cross country intelligence within the framework of an intelligence production function model. It proposes that average country intelligence is positively related to food security, healthy security, and education, but negatively related to income inequality. The empirical findings of the paper tend to provide statistical verification for each of these contentions.

Intellectual ability is critical not just for the operation of modern technologically sophisticated economy, but is also essential for rapid economic advancement through innovation, creativity, the development of new and improved products, and the introduction of new means of production. Intellectual ability, as measured by average country IQ scores, varies substantially across countries. This paper assumes that the level of intelligence is a product of a society that can be changed through appropriate changes in environmental, institutional, and cultural conditions. If this is the case, then it is a potentially highly profitable to understand the intelligence production process, to identify important variables in intelligence production function, in society. If the variables can be identified, then policy can be designed to promote favorable factors and to downplay unfavorable ones so as to enhance average societal intelligence.

GJMBR-B Classification: *JEL Code: Q00, E64*

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Intellectual ability is critical not just for the operation of modern technologically sophisticated economy, but is also essential for rapid economic advancement through innovation, creativity, the development of new and improved products, and the introduction of new means of production. Intellectual ability, as measured by average country IQ scores, varies substantially across countries. As a consequence, countries with lower average level of intelligence are at a distinct disadvantage with regard to economic growth and development relative to other countries. This paper assumes that the level of intelligence is a product of a society that can be changed through appropriate changes in environmental, institutional, and cultural conditions. If this is the case, then it is a potentially highly profitable to understand the intelligence production process, to identify important variables in intelligence production function, in society. If the variables can be identified, then policy can be designed to promote favorable factors and to downplay unfavorable ones so as to enhance average societal intelligence.

The central hypothesis of the paper is that conditions, some of which if made known could actually be subject to conscious policy control, matter, are critical, for the development of the modern intelligence of the people of a country. Four potential environmentally conditioning variables are considered and are empirically investigated for possible influence on the production of national intelligence. They are food security, health security, education, and income inequality.

The paper is divided into five sections. The first section reviews a little of the recent literature that focuses on the reasons and the consequences of the disparity in average IQ across countries. The second section provides a simple production function style model that essentially considers country intelligence as a product, implicitly implying that average country IQ depends on favorable conditions for intelligential development in a country, and on the lessening of conditions that are unfavorable for developing intelligence in a country. The third section reviews the variables that will be used in the regression analysis and identifies their sources.

The fourth section presents the results of cross country regressions on IQ within the general framework of the simple model. Finally, the fifth section rounds off the article with a few concluding remarks.

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I. Some Recent Backround Literature

Not surprisingly, quantitatively, IQ appears to matter for economic growth. Using average growth rates for the period 1965-1990 and for the period 1970-1995, Weede and Kampf's cross country regressions show that average country IQ is important for economic growth, both statistically and in terms of its overall impact, when controlling for common growth determining variables such as the level of economic development, the level of investment, literacy, freedom, and the improvement in freedom (Weede and Kampf 2002). They speculate in their conclusion that there might be a positive virtuous circle between economic growth and IQ, with higher IQ leading to greater economic growth, and greater economic growth, in turn, through improved nutrition, leading to higher average country IQ.

Meisenberg and Lynn look at the relationship between cognitive ability, as measured alternatively by IQ, school achievement, and a composite of IQ and school achievement, on a whole host of variables (Meisenberg and Lynn 2011). Their cross country regressions, which adjust for schooling and other variables, indicate that cognitive ability has a positive effect on economic growth, freedom, democracy, suicide, life expectancy, and fertility, but a negative effect on corruption, income inequality, and religiosity.

Di Pietro uses income inequality as an explanatory variable for explaining differences in cognitive abilities across countries (Di Pietro 2006). He finds a negative and significant relationship between IQ and Income inequality in his regressions.

Jamieson maintains that although favorable conditions allow a population to function more effectively and to attain a position closer to its maximum potential level of intelligence that potential intelligence itself is genetically determined and varies between groups of individuals (Jamieson 2003). He also feels that some societal organizations are more conducive to selection of greater intelligence than others, and

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believes that past natural selection has led to greater intelligence for groups that have been subject to more challenging environments. He expresses concern over the potential negative impact on future intelligence from, in his view, the current harmful artificial selection in western culture, in which the less successful members of the population have more children than the more successful.

Meisenberg notes that IQ is highly correlated with race, latitude (higher latitudes being associated with higher intelligence) and GDP per capita (Meisenberg 2003). He proposes that the Flynn effect, the large increase in intelligence over the last century in many countries, can be attributed to the positive feedback interaction between IQ and the standard of living, with higher IQ leading to an increase in the standard of living and a rise in the standard of living causing an increase in IQ.

Eppig, Fincher and Thornhill put forth a parasite stress hypothesis (Eppig, Fincher and Thornhill 2010). It essentially states that the need to fight off infectious diseases is detrimental to development of cognitive ability because the need to fight off infection from parasitic diseases uses body energy and resources that could otherwise be used for brain development. To test their theory, they look at the impact of the intensity of infectious diseases on cognitive ability across countries around the world and between countries within six major regions of the world, when controlling, in their regressions, for GDP per capita, education, temperature, and distance from Africa. They find evidence that infectious diseases have a negative effect on IQ for the world as a whole and for five of the six regions they consider, and that the intensity of infectious diseases is a strong predictor of intelligence thereby giving support to the parasitic stress hypothesis. In another more recent study, looking across U.S. States instead of across countries, they obtain similar results for the importance of parasitic infectious diseases on intelligence, and for the validity of the parasite stress hypothesis (Eppig, Fincher and Thornhill 2011).

Weiss theorizes that progress is not linear, but cyclical, and that both progress and the form of government depend critically on population characteristics such as population density and population quality (Weiss 2007). He believes that, whereas before we were in the ascendant phase of the cycle in which higher income people, people with greater intellectual ability, have a greater number of children than lower income people, thereby leading to increased average intelligence and a consequent positive feedback effect on economic growth, that, just when humans are overcrowding the planet and human civilization is in the greatest need for cognitive capacity, we are now in a dysgenic downward phase in which higher income people have few children, while lower income groups have many children with a resultant decrease in average intelligence. He can see no political solution to this human population quality problem but foresees the eventual collapse of human civilization into chaos. In his view, greater population density leads to more democratic and equalitarian values that prevent any policies, or even the consideration of policies, that are designed to change the distribution of births in a direction favorable for intelligence.

Barber focuses on the environmental variable education as a determinant of differences in IQ scores between countries (Barber 2005). In his regressions, he uses birth weight, illiteracy, infant mortality, geographic location, and GNP as control variables. The regressions show that IQ is positively related to education, but negatively related to illiteracy and the proportion of workers in agriculture.

II. The Production Function Style Model

The model between the average level of intelligence of society and key experiential variables in the intelligence production function consists of single equation with associated partial derivatives. The model's equation is as follows.

$$I = f(F, H, E, Q) \quad \delta I/\delta F > 0, \delta I/\delta H > 0, \delta I/\delta E > 0, \delta I/\delta Q < 0$$

In the model equation, I stands for the country's average level of intelligence, F for food security, H for health security, E for the average amount of education, and Q for the degree of income inequality.

A country's average intelligence is expected to be positively related to food security, health security, and the average amount of education, and negatively related to income inequality.

Without proper nutrition for children, and children are likely to be the first to suffer in the absence of food security, proper child brain development runs a high risk of being impaired or retarded. In addition, the brains of adults lacking food do not function to capacity, even if their brains are fully developed and lacking any ill consequences from childhood.

For similar reasons, it is anticipated that average intelligence will be positively related to health security. Just like the absence of food security, bad health retards child mental development, and, just like the lack of food security, poor health dampens adult physical and mental performance and effectiveness.

The third variable, income inequality, is expected to have a negative effect on national intelligence. Over and above its potential negative effects on the first two variables, food security and health security, greater income inequality reduces

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national intelligence for other reasons. Child mental development depends on parents providing a rich intellectual environment for their children, and on parents devoting large amounts of time and resources to child development. With greater inequality in society, fewer and fewer parents are in a position to be able to do this. Greater inequality also diminishes opportunity for those who are not at pinnacle of society. In the face of reduced opportunity, those at the lower end of the income distribution do not try to develop socially useful IQ intelligence which provides little or no future, but rather street smarts that are favorable for survival.

Finally, education is viewed as major institutional means to develop intelligence. Just being able to read, mere literacy, opens up worlds and gives potential access to a wide variety of new perspectives. If nothing else, formal education at least provides a block of time specifically devoted to mental development.

III. The Variables that are used in the Regression Analysis, Description, and Sources

The gauge of average national modern intelligence is the estimated national 2006 average IQ index score from Richard Lynn and Tatu Vanhanen's book entitled IQ and Global Inequality (Lynn and Vanhanen 2006).Their IQ index is standardized by setting the U.K. equal to a hundred, is available for one hundred and ninety countries, and varies from a low value of 59 to a high value of 108.

The measure of food security and the measure of health security are, respectively, the food security index and the health security index from the 2010 Human Security Index data set (Human Security Index 2010). For the available countries, the food security index ranges from zero to .960 and the health security index from .157 to .905.

Income inequality is the average Gini coefficient for the years 1990 through 2007. The average is calculated from the annual Gini coefficient numbers of the World Bank (World Bank 2011). In some cases the country average may be based on one or two years because of missing data. The potential range of the average Gini coefficient is between zero and a hundred with higher values indicating greater income inequality.

The amount of education is captured by using the average number of years of education received by people aging twenty-five years and older for the year 2010. The education data is taken from the United Nations (United Nations 2013).

IV. The Cross Country iq Regressions

Table I shows the cross country regressions of IQ on the four explanatory variables.

Table 1 : Cross Country Regressions Of Average Country Iq Scores On Food Security, Health Security, Income Inequaltiy, And Average Years Of Eduation

	(1)	(2)	(3)	(4)	(5)	(6)	(7)
CONSTANT	67.912 (48.52) *	48.184 (20.41) *	112.876 (29.21) *	65.289 (39.32) *	51.542 (20.15) *	60.386 (15.35) *	61.314 (16.00) *
FOODSECURITY	34.439 (12.82) *				11.892 (3.06) *	11.011 (2.72) *	10.752 (2.71) *
HEALTHSECURTIY		52.474 (15.61) *			39.417 (7.31) *	42.006 (8.32) *	35.155 (5.71) *
AVGGINI			-.6905 (-7.59) *			-.2254 (-3.44) *	-.2197 (-3.50) *
AVGSCHOOLING				2.830 (12.75) *			.5744 (2.08) **
RSQ	.469	.567	.288	.515	.588	.756	.795
N	188	188	144	155	188	144	129

The table is set up with the first column listing the explanatory variables. The second through the eighth columns show the results of a separate regression runs with the regressions numbered in the first row. If a variable enters an equation, then the top value corresponding to the row of the variable and the column of the equation that it enters is the estimated coefficient for that variable. Underneath its estimated coefficient is its individual t-statistic. A variable significant at the one percent level of significance or better in an equation is marked by a single asterisk under its individual t-statistic, while those that are significant at the five percent level of significance or better are labeled with two asterisks. Finally, the second

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to last row shows the R squared values, the last row reports the number of countries entering an equation.

The table consists of seven equations. The first four equations are the regressions of average country IQ separately on each one of the four different explanatory variables. The remaining equations show the results when the explanatory variables are used together in assorted combinations. The fifth regression equation employs food security and health security as the two independent variables. The sixth equation adds income inequality, and the seventh equation uses all four explanatory variables.

The results lend strong support for the notion that national intelligence is a produced phenomenon, and that differences in average intelligence between nations can be ascribed to dissimilarity in intellectual developmental conditions between nations. In every one of the seven equations in the table, the estimated coefficients on the variables have their theoretically expected signs, positive signs for food security, health security, and the average amount of education, and a negative sign for income inequality.

Looking at the individual t-statistics for the variables reveals that all the variables are consistently highly statistically significant. Except for average schooling in equation seven (in which it is significant at the five percent level or significance or better), each and every one of the variables is significant at the one percent level of significance or better in every equation in which they appear.

The r-squared values, especially for a cross section, are quite good. On its own health security accounts for over fifty six percent of the total variation in average IQ scores across nations, and, when used in combination with food security, the two variables together account for over fifty eight percent of the variation. Looking at equation seven shows that the four variables as a group account for almost eighty percent of the variation in IQ scores across countries.

V. Conclusion

Given intelligence is so important for economic progress and is becoming even more essential with the passage of time, countries need to focus on the ingredients in the making of national intelligence so as to be able to conduct informed, intelligent, and effective policy to upgrade national intelligence. The empirical results suggest that if a country wants to produce a high level of average intelligence in its population, with all its consequent positive effects on economic growth and development, then it must be sure to design, implement, and maintain policies that assure food and health security for its population, that provide decent education for all, and that keeps income inequality within bounds.

Food and health security are critical for the optimal intellectual development of youth and for effective functioning and performance of adults. Education provides the space and the time for children to expand their minds and to improve their mental abilities. On the other hand, extremely high levels of inequality is likely to reduce the actual opportunities and the perceived chances of advancement for all but the elite, thereby dampening incentives and motivation for the general population, leading to reduced investment in human capital in themselves and in their children.

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Global Journal of Management and Business Research: B
Economics and Commerce
Volume 14 Issue 2 Version 1.0 Year 2014
Type: Double Blind Peer Reviewed International Research Journal
Publisher: Global Journals Inc. (USA)
Online ISSN: 2249-4588 & Print ISSN: 0975-5853

The Mining Boom, Productivity Paradox, Dutch Disease & Monetary Policy Challenges for Australia

By Neil Dias Karunaratne
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Abstract- Australia is currently on the cusp of the biggest mining boom in its history powered by demand from the fast growing mega Asian economies. However, productivity has slumped in 2000 decade compared to the previous despite a record increase in the terms-of-trade and capital investment in the mining sector. The appreciation of the real exchange rate due to spending effects of the booming mining sector and deindustrialisation of the lagging manufacturing sector by undermining the international competitiveness of manufactured exports has infected the Australian economy with Dutch Disease effects. Policy designers face the daunting task of designing appropriate adjustment policies that should groom manufacturing industries with productivity generation learning-by-doing economies, whilst at the same time implementing monetary policies that would keep inflation within the target zone. The paper sheds light on the issues relating to the designing g monetary policy in the context of productivity augmenting time-varying NAIRU using a New Keynesian Phillips curve framework. State space methodology and Kalman Filer has been used to empirically validate the model. Various policy options besides a Taylor rule for keeping inflation within the target zone and policy options to prevent the resource boom from turning to a resource curse are also commented on.

Keywords: mining boom. productivity conundrum. deindustrialization. dutch disease. time-varying nairu. new keynesian phillips curve. inflation targeting. State space methodology. australia.

GJMBR-B Classification: FOR Code: C22,:C50, E31, E51, F32, O56



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I. Introduction

The Australian economy in the mid-2010 decade has experienced the largest mineral resources export boom in its recorded history. The current mining boom has surpassed both in its macroeconomic impact and in its protracted duration the previous iconic mining booms such as the gold rush of the 1850s, the Korean wool boom of the 1950s and the Japanese driven energy boom of the 1970s. The current mining boom has been fuelled by the demand for mineral resources from the fast growing and urbanizing mega Asian economies of China and India causing the rise in world price of primary commodity exports to sky-rocket the Australian TOT to reach the highest peak in 2011Q2 over the past 140 years of its recorded history.

The previous resource booms were short-lived and turned into resource curses because of the failure to implement policies and establish the macroeconomic institutional framework that would deliver stability and sustained long-term growth. A comparative review of the past mining booms that engulfed Australia indicate that they shared some major common features in that they were the upshot of :

1. Major global events such as wars.
2. Significant macroeconomic changes due to recessions.
3. Supply shocks, such as the oil price shock resulting in stagflation or simultaneous increase in inflation and unemployment in the 1970s.
4. Changes in the exchange rate regime due to the collapse of the Bretton Woods system of pegged exchange rates and generalised floating by industrial countries.
5. Inflation targeting replacing monetary targeting that malfunctioned because of the changing nature of monetary aggregates.
6. Financial deregulation caused by the 'impossible trinity' of pursuing independent monetary policy under flexible exchange rate regimes with capital mobility.
7. Labour market reforms, which in the Australian context replaced the centralised wage-fixing system that that transmitted wage increases in one sector across the economy through the operation of the principle of comparative wage justice resulting in bouts of wage inflation followed by increase unemployment (Conolly and Orsmund 2011). However, the introduction of enterprise bargaining forged through the various Accords between the government and trade unions by linking wage increases to productivity subdued inflationary pressures.

The current mining boom, the largest in Australia's recorded history, has the potential to deliver a cornucopia of sustainable macroeconomic benefits or turn into the boom into resource curse, because of the failure to implement appropriate monetary and adjustment policies and establish flexible financial and labour market institutional frameworks. Therefore, it is imperative that appropriate short-run monetary and long-term adjustment policies be designed preemptively

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to harness and the potential benefits of the resources boom to promote sustainable long-term growth. Both the lessons of Australia's past mining booms and cross-country international historical evidence demonstrate that failure to design appropriate policies and institutional frameworks can turn a mineral resource boom into a resource curse through the spread of Dutch disease effects.

The rest of the paper is organised as follows: Section 2 reviews the 'productivity conundrum'' that has blighted the Australian economy by turning the productivity surge of the 1990s decade to a productivity slump in the 2000 decade. This section explains that the productivity conundrum is a transitory phenomenon that will rectify when the investments in the mining sector attain capacity production. Section 3 sheds light on the resource curse phenomena that manifests in the shape of the twin forces of first: deindustrialisation that occurs due to the change in the sectoral composition of the structure of the economy and second, due to Dutch disease effects that eventuate from growth dynamics that accompanies a mining boom as a result of the sky-rocketing TOT and exchange rate appreciation. Section discusses the monetary policy design based on the triangle model of the Phillips curve model and three benchmark TV-NAIRU models to moderate the wage aspiration effects that could emanate from the changes in productivity due to the mining boom . Section 5 presents the concluding observations highlighting the complexity of the monetary policy design that confront a small open economy such as Australia that is experiencing a massive mining boom. A major contribution of the paper is the empirical analysis of repercussions of the mining boom and monetary policy design is analysed using State Space methodology and the Kalman Filter. The empirical analysis is based on a seasonally adjusted quarterly data set covering the period 1978Q3-2011Q1. The data set has been sourced from the Key Indicators and National Accounts published by the ABS (See Appendix for the time-series and dataset used in this paper). A number of software packages such as EViews 8.0, RATS 7 and STAMP 8.3 were used in the empirical analyses.

II. The Productivity Paradox

A review of the performance of the Australian economy over the past four decades reveals that productivity measured in terms of labour productivity (LPR) (output per hours worked) and multifactor productivity (MFP) (output per input of all factors of production) have been the crucial determinant of Australia's living standards as measured by per capita income. Accounting for growth of output in terms of MFP, Capital deepening (CAP) and Labor Productivity (LPR) based on Trans log growth accounting framework yielded decade-wise average growth rates for GDP and its components for the four deades 1980s, 1990s, 2000s and 2010sas reported in Table 1.

Table 1

Decade	CAP	LPR	MFP	GDP/VA
AVG1970s	1.57	-0.26	1.27	2.59
AVG1980s	1.86	0.97	0.40	3.23
AVG1990s	1.50	0.31	1.74	3.55
AVG2000s	2.24	0.58	0.42	3.24

Notes: CAP: Capital Intensity, LPR: Labor Productivity (Output per hours worked), MFP: Multifactor Productivity. The above estimates are based by fitting a Translog production function to data from 12 industries in the market sector. The Translog fit enables growth accounts to be additive. Laspeyere index numbers have been used to estimate GDP/VA, Tornquvist indexes based on weighted change in capital stock measures capital services, while labour input index was estimated using a simple elemental index based on hours worked., Source: ABS Cat. 5206.0.55.002 Experimental Estimates of Industry Multifactor Productivity 2011-12.

The decade-wise contributions to average GDP growth rates in Table 1 reveal that growth in MFP declined from 1.74% to 0.42% and LPR despite the increase in CAP from 1.50% to 2.24% increased modestly from 0.31% to 0.58% The slump in productivity in 2000s decade when compared to the surge in productivity in the 'golden age' of 1990s led to much consternation amongst both politicians and policymakers. Because, if the productivity slow-down continues into the future it would undermine the living standards of Australians as measured by growth in per capita income. The analysis of growth in per capita income depends crucially on the three P's: Population, Productivity and the Participation Rate.

An algebraic expose of how the 3 P's determine per capita GDP is explained by the formula (Endnote 1) based on Eslake and Walsh (2011).

The slump in productivity in the 2000 decade compared to the previous 1990s decade would have depressed Real GDP per capita and living standards, but TOT hike driven by the mining boom causing increased real gross domestic income (RGDI), i.e.. RGDP adjusted for the changes in the TOT, to increase and offset the adverse effects of productivity slump. During the 1990s decade the TOT effect subtracted approximately 0.1% p.a. from the growth of RGDP. But over the 2000s decade the increase in the TOT boosted the growth of RGDI by 0.9% p.a. This gain from the TOT more than offset the adverse effects of the decline in productivity and prevented a decline in RGDP as reported in Table 2.

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Table 2

Table 2. Contributions of the 3 Ps & TOT to GDP (Living Standards)

Decade	POP	PAR	LPR	GDP	TOT	GNI
1990s	1.4	-0.1	2.1	3.4	-0.1	3.3
2000s	1.8	-0.3	1.4	3.1	0.9	4

Sources: ABS Cat. 5206
Treasury (2010) Intergenerational Report.
Eslake & Walsh(2011)

According to the projections of the Intergenerational Report Treasury (2010) the trends in population growth, and labor force participation rate are anticipated to decline due to the demographics of the ageing population. Furthermore, the TOT movements are not expected to add to the growth of GNI over the next two decades. Therefore, the onus for the increasing the growth of real GDP and living standards in the next two decades of 2010 and 2020 is expected to fall squarely on the increase of productivity. The slump in productivity in 2000 and the gloom predictions about the demographic effects of the ageing population led to much consternation both among politicians and policymakers. This led to the setting up of Parliamentary Inquiry (2011) to identify the causes of the productivity slump of the 2000 and recommend policy measures to reverse the declining productivity trends. The slump in productivity in the 2000s decade despite a record rise in the TOT powered by the mining boom conjures up a conundrum that requires explanation. The evolution of a mining boom-bust cycle can be stylized in terms of a three overlapping phase heuristic model where the macroeconomic effects are driven: In Phase I by the increase in the TOT. In Phase II by the inflow of investment into the mineral resource sector. In Phase III by the increase in mining production and exports (Plumb et al. 2013). The productivity conundrum experienced during the decades of the 1990s and 2000 have been attributed to various causes such as the: mismeasurement of labour due to labour hoarding during recessions, increase in directly unproductive (DUP) activities due to the proliferation of red and green tape. The widening of the chasm between the domestic production frontier and the world's best practice production frontier as measured by the US production frontier, where the production frontier measures the maximum output that can be produced efficiently from a given set of factor input (Banks 2011, D'Arcy and Gustaffson 2012).

The emergence of the productivity slump in the 2000s was a fall-out from the lumpy investment in mining projects (coal, iron ore, liquefied natural gas (LNG) and coal seam gas(CSG) that had a long-gestation period leading to a lower productivity during the gestation period where projects did not reap the benefits of economies of scale because they were operating below full capacity. In the short-run the increase demand for finite exhaustible mineral resources, in the absence of new resource discoveries, jacks-up the scarcity rents and resource prices due to the operation of efficient competitive market forces leading to conservation of resources, as hypothesised in the Hotelling Rule (Hotelling 1931). However, the optimal exploitation of homogenous finite natural resources in resources in the long-run as subsumed in the Hotelling Rule are undermined in the short-run because of: market power, non-constant returns to scale, quasi-fixity of capital inputs and missing inputs makes natural resources heterogeneous. (Zheng and Bloch 2010). Productivity Commission studies for Australia during the current mining boom contends that resource heterogeneity occurs because in the short-run the extraction costs of natural resources increase as less accessible resource bodies have to be mined, using more costly capital intensive techniques, and the failure to take into account these missing inputs has led to underestimation of multifactor productivity (MFP) to the tune of 2.5% in 2000s decade (Topp et al. 2008). The mismeasurement of MFP has probably contributed to the exaggeration of the severity of productivity slump during 2000s decade and has magnified the productivity conundrum that occurred during the study period.

a) The economy-wide repurcussions of the TOT boom

The record increase in the TOT due to the increase in global demand for Australia's mineral exports not only caused the productivity surge and slump during the study period has economy-wide repercussions. Since Australia is a small open economy and a price taker in the world market. the occurrence of a mining boom can drive the economy to hit capacity limits and lead to overheating in a economy operating at full employment, becausee AD exceeds AS unleashing inflationary pressures. Therefore, the design of proper monetary policy to keep

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inflation within the target zone and establishing sound institutions to manage the strucural adjustments required to achieve internal balance (full employment and stable inflation) and external balance (a sustainable current account deficit) to prevent a resource boom from turning into a resource curse is a policy imperative that requires attention. However, the design of optimal monetary policy in economy on the cusp of a mining boom has to take account of many economy-wide repercussions due to the mining boom. In the sequel we review the dynamics of two phenomena: deindustrialisation and Dutch Disease effects that that can convert a resource boom to a resource curse if they are ignored by policymakers.

III. The Resource Curse - Deindustrialisation & Dutch Disease Effects

Deindustrializtion occurs due to changes in the economic structure as an economy matures or develops causing the share of industry to shrink relative to agriculture and services in tri-sector classification of the economy. Manufactruing is a sub-sector of the much broader industrial sector which encompasses mining and construction. But changes in productivity or labour intensity of manufacturing plays the catalytic role in deindustrialisation through the restructing of the sectoral composition of the economy when measured in terms of the sectoral share of employment or value-added or GDP as a percentage of the total employment and GDP of the mactoeconomy. Neoclassical or Solow growth theory (Solow 1956) accords no role to industrial policy to counter the short-term adverse effects of the diminishing marginal productivity of capital and in the long-run economic growth is determined by exogenous forces of capital accumulation and technical progress. However, heterodox or structuralist growth perspectives in contrast to neoclassical growth theory identifies that growth in productivity in manufacturing or decrease in its labor intensity plays a dynamic role in accelerating or retarding long-term economic growth in advanced capitalist economies. This thesis is exemplified in the three Kaldorian laws (Kaldor 1967). The first law postulates that growth in manufacturing productivity acts as an 'engine of growth' for the whole economy. The second law, also known as the Verdoon law, after Verdoon (1949), postulates that increasing labour productivity by activating dynamic economies of scale boosts productivity in the manufacturing sector. The third law, postulates growth in labor productivity ignites a virturous cycle that bolsters productivity of both manufacturing and non-manufacturing sectors.

A noteworthy empirical study (Tregenna 2008) applies a decomposition technique to 48 countries and clarifies that deindustrialisation due to increase in labor productivity or inversely an increase in labor intensity can result in not only the share of employment but also the value added of GDP when compared to their magnitudes in the macroeconomy. Tregenna also embraces the Kaldorian prespective that manufacturing is a 'leading engine' of long-term growth because manufacturing is imbdued with a host of growth promoting special characteristics such as as backward and forward linkages, spread effects, learning-by-doing (LBD) economies, innovation and technical progress, salubrious balance of payments effects and dynamic economies scale. Tregenna (2011) In a comprehensive literature survey of deindustrialisation reviews the various conceptualisations of deindustrialisation: According to Singh (1977) deindustrialisation is a manifestationof macroeconomic disequilibrium due to inefficient or high cost manufacturing production resulting in both decrease domestic consumer welfare and international competitiveness manufactured exports. Tregenna (2009) in a seminal study, defined deindustrialization as the consistent reduction in the share of employment and valued of industry in the total employment and GDP in the macroeconomy. According to Rawthorn and Wells (1987) deindustrialization manifests as a persistent fall in of the share of industrial employment of a country or a region due to the interactionof diverse factors such as income elasticity of demand, outsourcing , new international division of labour and Dutch disease effects. Such deindustrializtion can be regarded as postive if the job losses in the manufacturing sector due increase in productivity is offset by the increase of job creation in the service sector, otherwise deindustrialization can be regarded as negative. Saeger (1997) contends on the basis of a study of 23 OECD countries that manufacturing imports from developing countries or the South has led to deindustrialization of the North. Rawthorn and Ramaswamy (1997) based on a study of 18 OECD countries contend that deindustrialization of the North is due to industrial growth dynamics and not due to competitive inroads from the South. Rowthorn and Coutts (2004) summarizes five explanations of deindustrialization as advanced in the literature. First, outsourcing of some manufacturing activities to cheaper specialized producers resulting in an illusory rather than a real reduction of manufacturing employment. Second, the fall in the relative price of manufactures decreases its share consumer expenditure. Third, higher growth in productivity of manufacturing leads to slower growth in manufacturing employment relative to service sector employment. Fourth, increase in productivity in manufacturing in advanced countries are associated with the production of more sophisticated capital intensive products relative to labor intensive products, resulting in decrease in employment . Fifth. increase productivity in manufacturing will lead to decreasing investment in manufacturing sector and therefore decrease in employment and GDP generated by the

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sector. Sixth, Dutch disease effects that arise from resource discoveries as described by Palma (2005, 2008) and elaborated in the next section can be a major force in deindustriaization in advanced countries such as Australia.

The decadewise changes in the sectoral composition of the Australian macroeconomy reported in Table 1 reflects the deindustrialisation dynamics observed due to the changes in productivity the productivity slump in the 2000s decade compared to the surge in 1990s resulted in the reduction of both employment and output or GDP due both deindustrialiation dynamics as observed in other advanced countries and also due to the Dutch disease effects generated by mining boom. The shrinking of the manufacturing sector and the expansion of the service sector over the decades corroborrates that the Australian economy exhibited the same deindustrialisation dynamics as other advanced economies as they developed insert and matured over the decades.

Table 3

Decade	Agriculture ,Forestry & Fishing	Mining & Construction	Employment Manufacturing	Services	Total	Total Employment
	%	%	%	%	%	000
AVG 1980	5.9	8.6	15.7	69.8	100.0	4929.2
AVG 1990	5.2	8.3	13.2	73.4	100.0	5938.3
AVG 2000	3.9	9.5	10.6	76.0	100.0	7512.7
AVG 2010	3.1	11.0	8.6	77.4	100.0	8787.6

Agriculture, Forestry & Fishing	Mining & Construction	Manufacturing	Services	Total	GDP
%	%	%	%	%	$ million
2.5	11.9	12.9	72.7	100.0	636152.8
2.4	12.9	11.6	73.1	100.0	776070.5
2.3	11.8	9.6	76.3	100.0	1107473.1
2.2	11.9	8.2	77.7	100.0	1305647.0

a) Dutch Disease Effects

The productivity conundrum or the productivity paradox that occurred in the decades of 1990s and 2000s as analysed in the previous Section 2 witnessed the harbinger of the biggest mining boom to engulf Australia in the mid-2010 decade that occrred in Australia since its Federation 1989. Historical evidence is replete with examples that resource booms turn into a resource curse as exemplified by the aftermath of the adverse macroeconomic effects that ravaged the Dutch economy after the North Sea oil and gas boom of the 1970s. Some of the causes that converted a resource boom into a curse have been identified in the literature: they are the:

i. The retardation of growth due to increase commodity price and income volatility.
ii. The Increase in corruption, rent-seeking activity eroding the effectiveness of democratic policy making and institutions
iii. The pursuit of procyclical fiscal policies resulting in wasteful expenditure leading unbalanced growth due to the failure to promote the development of the non-resource sectors.
iv. Failure to pursue prudent monetary policies that anchor inflation expectations.
v. Failure to deregulate labour markets.
vi. Pursuit of the wrong exchange rate regim.
vii. Distorted taxation policies and the like (Sachs and Warner 2001).

b) The Resource Curse or Dutch Disease (DD) model

The cannonical ' Dutch Disease' (DD) Model as conceptualised in the seminal paper by (Corden and Neary 1982) and the "Core" model is recapitulated by Corden (1984) in terms of a neoclassical or factor endowment trade model comprising of three sectors. The Corden core model is analogous to the Gregory (1976) models an follows on the pedigree of the Salter (1959), Swan (1960) dependency model by dichotomizing the tradable sector into a booming tradable sector driven by world resource prices and a nontradable sector. The price of tradables are determined by forces of supply and demand in the world market, while price of nontradables are determined by domestic market forces. The core Corden- Gregory DD model of a small open economy comprises of three sectors:

Sector 1 : Booming tradables sector (mining sector).
Sector 2 : Lagging tradables sector (includes parts of manfacturing, agriculture & service sectors).
Sector 3 : Nontradables sector (services sector).

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The booming tradable sector would be activated by the rise in the world price of resources as has occurred during the current mining boom in Australia, where the price of mining exports (coal and iron ore) grew by 140% driven by demand from the fast growing emerging market economies of China and India. The booming tradable sector sets in motion two effects: a resource movement effect and a spending effect. The resource movement effect pulls factors of production into the booming sector from the the lagging tradable and nontradable causing their output to fall leading to 'direct deindustrialisation'.

Corden (2011) contends that the resource movement effect by pulling capital and labor to the more profitable booming mining sector creates a shortage of skilled labor in the non-booming sectors of the economy. However, in the Australian context the recource movement effect does not create significant adverse DD effects because of two reasons: First, skilled immigration (through the issue of 457 visas) overcomes skilled labor shortages in the booming mining sector. Second, free international capital mobility ensures that foreign capital can flow freely to the booming sector if it satisfies the national criteria specified by the Foreign Investment Review Board. Therefore, direct adverse DD effects of the resource boom in Australia are according to the empirical judgement of Corden (2011) are likely to be modest. The adverse DD effects of the mineral resource boom in Australia are generated mainly by the spending effect.

The spending effect arises both because incomes and capital investment in the booming mining sector rise due to the rise in the world prices of mining exports. The causes a rise in the terms of trade and an appreciation of the real exchange rate. The capital inflow into the booming sector further reinforces the exchange rate appreciation. In Australia during the current mining boom (2005-2011) the real exchange rate measured by the Austrlian TWI (Trade-Weignted Index) increased by 31% in response the rise of the terms of trade by 41% mainly driven by the sky-rocketing mining export (coal and iron ore) prices that peaked at 140% over their long-term average value. The real appreciation of the exchange rate rendered uncompetitive exports from the lagging tradable sector, which included traditional manufactures, some agricultural exports and services related to tourism, and export of education and health services. Thus, the locus of the adverse DD effect due to the real exchange rate appreciation falls squarely on the lagging tradable sector activities, which in the Australian context includes parts of manufacturing, agriculture and services such as tourism and education.

The lagging sectors are the losers due to the adverse DD effects caused by the real exchange rate appreciation of the booming sector exports. The gainers of the mining boom are the investors and employees in the booming sector and the losers are investors and employees in the lagging or non-booming sectors. If tax-revenue from the potential gainers of the booming sector are spent prudently increasing community welfare thus compensating the losers, the adverse DD effects on the losers in the mining sector can be mitigated. However, full Pareto compensating tax-redistribution never eventuates and in reality the non-booming sector bears the full brunt of adverse DD effects.

c) The '"Two speed economy""

It is noteworthy that the DD or resource curse effects have a spatial dimension, which manifiests as in a "two speed economy", where the resource rich regions/states prosper while the resource poor regions/ states stagnate or decline. The spatial or 'two speed effects' of mining boom can be measured using a structural change index (SCI) as proposed by Conolly and Osmund (2011) (See Endnote 4)

During the current mining boom in the 2000s decade the SCI measured in terms of nominal output and investment has been the highest on record over the past 50 years. But the SCI index in terms of real output and employment has fallen rather than increased during the 50 year period. The resource rich states of Western Australia and Queensland the SCI for investment, output and population growth has been higher than the other three resource poor states during the mining boom period implying that were laggard because of DD effects. The SCI for the 8 industry groups which ABS published data measured in terms of nominal output and investment increased, while measured in t terms of real output and employment has hardly changed. This lack lustre performance has occurred because the long gestation lags between investment and output in mining industries, because of two DD effects associated with mining investments. First, mining investments have a long gestation lag between output and investment an secondly, they are capital intensive and therefore fail to lead to significant inreases in jobs or emplyoment in the short-run because production is at sub-optimal scale or capacity in the short-run.

d) Accounting for changes in Productivity – the elephant in the room

As the mining boom evolves through the different phases productivity too vary in sympathy. The changes in productivity has repercussions on wage aspriations and inflation. Past mining booms occurred under the centalised wage-fixing system, where increase in award wages in one industry was transmitted to other industries through the principle of comparative wage justice regardless of the productivity record of that industry. Therefore, under the mining booms TOT increases led to wage explostions that fuelled double digit inflation and high unemployment rates. However, the current mining boom has occurred under a deregulated labour market that replaced the centralise wage-fixing system. Besides, the floating of the

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exchange rate and inflation targeting has anchored inflation expectations leading to more subdued wage growth in 2000s replacing the wage explosions in the 1980s.

The link between productivity and wages has international and domestic dimensions and makes a well functioning labour market with a proper industrial relations system the 'elephant in the room' in designing policies to boost productivity.

The rise in price of tradables (mineral resource exports) is associated with the higher productivity of the tradable sector in advanced economy such as Australia. The higher produtivity in the tradable sector results in higher prices and wages in the tradable sector, which spill sover to the nontradable sectors (utilities and services). This results in higher prices for not only tradables but also nontradables in an advanced economy such as Australia compared to nontradables in developing countries. This Balassa-Samuelson effect explains why haircuts are more expensive in Australia than in Indonesia (Balassa 1964).

e) Structural adjustment and labour productivity

Australia currently boasts of one of the lowest unemployment rates amongst the advanced economies. The unemployment rate has hovered around 5.25% despite the occurrence of high degree of labour turnover as shown by the high degree of dispersion, measured by the low coefficient of variation of the 19 industries for which ABS publishes data. Furthermore. relative wages in the mining sector and related professional service industries has increased by more than 10% compared to the economy-wide average since 2005. At the same time relative wages of manufacturing, retail and accommodation industries have declined (Lowe 2012). Nevertheless, there is scope for further reform in Australia's industrial relations (IR) to make it more flexible and productive to cope with increasing challenges of global competitiveness. The Employer lobbies contend that the current Fair Work Act that safeguards penalty rates and generous parental leave entitlements inhibit workplace flexibility and innovation by jacking up wages and making manufacturing and other exports internationally uncompetitive. Therefore, reform of the Industrial relations and Fair Work Act has been flagged as an urgent requirement to keep the lid wage inflation as well as to boost the international competitiveness of manufactured exports (Willox 2012).

IV. Monetary Policy Design Issues

Eq. (1) of the 'triangle model' specified that in the absence supply shocks , when the unemployment rate equals to NAIRU, inflation equals expected inflation or steady state inflation , i.e. in symbols when ut = ut* ,, $\pi t = \pi t^e$ e yielding steady state or a stable inflation rate. It also follows that if the unemployment rate falls below NAIRU, then because aggregate Eq. (1). predicts that if aggregate demand exceeds aggregate supply, the economy may be hitting 'capacity constraints leading to 'overheating' and unleashing of inflationary pressures. Such a scenario would suggest that monetary policy should be tightened to dampen inflationary pressures. i.e. in symbols when $u < u^*$, a tight monetary policy stance would be required to keep the inflation rate in the stable target zone.. The converse scenario signalling the need for expansionary monetary policy eventuates when $u > u^*$.

However, the assumption of a constant NAIRU robs it from acting as a leading indicator in crafting the stance of monetary policy. Moreover, a constant of NAIRU or the text-book NAIRU peddled by Gordon (1997) for the US, lacked both empirical and theoretical support. Empirically it was observed that in most industrialised countries NAIRU was time-varying rather than constant. Theoretically, NAIRU was postulated to be time-varying and not a constant " carved in stone" but rather a " level that it would be generated out of the Walrasian system of general equilibrium equations, provided there is embedded in them the actual structural characteristics of the labour and commodity markets" (Friedman 1968). Therefore TV-NAIRU and the unemployment gap can play a pivotal role in crafting the stance of monetary policy to keep inflation at bay. NAIRU could be falling over time due to the interplay of a number of factors such as:

i. Demographic change due to ageing baby boomers exhibiting a lower NAIRU as their skills increase.
ii. Competitive forces due to trade liberalisation and shift from centralised wage bargaining to enterprise bargaining has lowered NAIRU.
iii. Hysteresis, because increase in unemployment leads to skill atrophy and eventually the insiders would have to lower NAIRU because of pressure from outsiders.
iv. Last but not least, surges and slumps of productivity could also affect NAIRU through changes in workers wage aspirations. Friedman also observed any attempt by policymakers to systematically keep NAIRU will only lead to eve accelerating inflation. Only in the long-run the Phillips curve is vertical at the natural rate with no tradeoffs between inflation and the unemployment rate. Therefore, both on empirical and theoretical grounds a TV-NAIRU model would provide more useful guidelines for designing monetary policy to achieve stabilisation cannot be gainsaid.

The implications of the mining boom for design of monetary policy can be analysed using the 'triangle' model of the Phillips curve or the expectations augmented Phillips curve as specified by Gordon (1997) and others. The 'triangle' model describes that that change in inflation is the upshot of effects of past inflation or inertia, the demand pull effects of the

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business cycle as proxied by the unemployment gap and exogenous cost-push effects of supply shocks such as the terms of trade shock or productivity shocks as specified in the signal or measurement Eq. (1) below:

$$[(\pi]_t - \pi_t^e) = \beta(L)(\pi_{t-1} - \pi_{t-1}^e) + \gamma(L)(u_{t-1} - u_{t-1}^*) + \delta(L)X_{t-1} + \varepsilon_t \quad (1)$$

where π^et::inflation rate, π^eet: expected inflation, , π^et:= , πt- 1 adaptive expectations defining the change inflation as π^et:= , πt- 1), the unemployment gap or Ugap = (ut –ut*), where ut is the unemployment rate an ut* :is the natural rate or NAIRU. The vector Xt: comprises of exogenous supply shocks such as the TOT or productivity shock. The terms $\beta(L), \gamma(L), \delta(L)$ are lag polynomials. The disturbance term is white noise (i.e. has no serial correlation) and is distributed independent normal with mean zero and constant variance i.e..et ~~NID ~ $(0, \sigma^2_\varepsilon)$.

The triangle model of the Phillips curve specified in Eq.1 has become a centre piece of the intellectual framework for designing monetary policy stance in the RBA (Gruen et al. 1999). However, in the 1970s when the Phillips curve tradeoffs broke down under stagflation proponents of rational expectations theories declared that the Phillips curve had failed on a grand scale (Lucas and Sargent 1978). The modern expectations augmented Phillips curve or the triangle model specified in Eq.1 by Gordon and Mankiw is based on sound micro-foundations rooted in New Keynesian 'sticky price' theories (Aguiar and Martins 2005). . The theoretical robustness of the triangle model has made it the candidate of choice for the empirical analysis of monetary policy design issues using State Space and Kalman Filter econometric methodology in this paper.

The triangle model of the Phillips curve (Eq.1) postulates that in the absence of supply shocks, when inflation equals to stable expected inflation the unemployment rate equals the natural rate or NAIRU (ut*). Eq. (1).also provides useful insights for policymakers to design the stance of monetary policy to keep inflation within the prescribed target zone.

According Eq. 1 if aggregate demand exceeds aggregate supply, the economy may be hitting 'capacity constraints' and 'overheating' due to infrastructure bottlenecks or skill shortages. Such scenario could occur when ut < ut* fuelling inflationary pressures suggesting tightening of monetary policy to douse a possible inflation conflagration. inflation dragon at bay. When ut < ut* , the converse scenario of deflation that could emerges prompts that expansionary monetary policy would be appropriate .Thus, the unemployment gap or deviation of the unemployment rate from NAIRU i.e.Ugap = (ut < ut*) is a good leading indicator of inflationary pressures that may be incubating in the economy and provide useful information to chisel out the appropriate expansionary stance of monetary policy. When ut > ut* the converse scenario would prompt the chiselling out of tight monetary policy stance to achieve the goals of macroeconomic stability or internal balance. In this paper we use three different models to analyse the implications of deviation of the unemployment rate from NAIRU or the Ugap and the information it provides to craft a monetary policy stance to keep inflation with the target zone.

The three benchmark models that play a pivotal role in the design of monetary policy architecture in a small open economy that is experiencing a sky-rocketing TOT due to mining boom having repercussions on inflation and productivity:

i. Constant NAIRU model.
ii. Random Walk Time-Varying (TV) NAIRU model.
iii. Productivity augmented TV-NAIRU model.

i. The Constant NAIRU model or text--book NAIRU was used by Gordon to explain the inflation scenario prevailed in the US in the 1970s (Gordon 1997). The Constant NAIRU model for Australia for the sample period 1978Q3-2011Q1 has been estimated for Australia by applying the OLS technique to the triangle model of the Phillips curve as specified in the Eq. (1) below: :

$$[\Delta\pi]_t = \gamma_0 + \beta(L)[\Delta\pi]_{(t-1)} + \gamma(L)(u_{(t-1)}) + \delta(L)X_t + \varepsilon_t ,$$

The estimate of constant NAIRU can be derived by dividing the intercept term by the sum of coefficients of the unemployment rates. In symbols:

$$[\Delta\pi]_t = \gamma_0 + \beta(L)[\Delta\pi]_{(t-1)} + \gamma(L)(u_{(t-1)}) + \delta(L)X_t + \varepsilon_t ,$$

The estimate of constant NAIRU can be derived by dividing the intercept term by the sum of unemployment rate coefficients as indicted below:

u* = -γ0/γ (1),Friedman (1968) where γ (1) = the sum of coefficients of the unemployment rate. The estimate of constant NAIRU for the sample period 1977Q2-2000Q1 for Australia is u* = 0.0059/0.0008= 6.5 % as derived from OLS estimates are reported in Table 8.

NAIRU or u* = γ0/γ 1), where γ (1) = the sum of coefficients of the unemployment rate.

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Table 8 : OLS Estimates of constant NAIRU

Dependent Variable: DINF
Method: Least Squares
Date: 10/11/12 Time: 12:08
Sample (adjusted): 1979Q2 2010Q4
Included observations: 127 after adjustments

Variable	Coefficient	Std. Error	t-Statistic	Prob.
C(1)	0.005916	0.003340	1.771294	0.0790
DINF(-1)	-0.675413	0.088614	-7.621963	0.0000
DINF(-2)	-0.430110	0.100457	-4.281549	0.0000
DINF(-3)	-0.205956	0.088687	-2.322281	0.0219
U(-1)	-0.000872	0.000465	-1.878222	0.0628
X1	-0.001231	0.000846	-1.455159	0.1482

R-squared	0.327978	Mean dependent var	-0.000103
Adjusted R-squared	0.300209	S.D. dependent var	0.008054
S.E. of regression	0.006737	Akaike info criterion	-7.116241
Sum squared resid	0.005492	Schwarz criterion	-6.981870
Log likelihood	457.8813	Hannan-Quinn criterion.	-7.061648
Durbin-Watson stat	1.983649		

However, a constant NAIRU is sterile from a practical policy perspective and it also lacks theoretical foundations. Therefore, Time-Varying or TV-NAIRU model has been formulated to overcome the deficiencies of the Constant NAIRU model.

ii. Time-Varying NAIRU (TV NAIRU) model, Friedman (1968) hypothesised that "NAIRU is not carved in stone…it is the level that would be ground by the general equilibrium equations, provided there is embedded in them the actual structural characteristics of labour and commodity markets, including market imperfections, stochastic variability in demands and supplies, the cost of gathering information about job vacancies and labour availabilities, the cost of mobility, and so on." (Staiger and Watson 1997) conceptualised that the Time-varying NAIRU (TV-NAIRU) model captured adequately the Friedmanite time profile of the natural rate of unemployment or time-varying NAIRU due to changes in institutional structure of the labour and commodity markets. The natural rate or NAIRU can change over time due to the interplay of a number of factors such as: Demographic change due to ageing baby boomers exhibiting a lower NAIRU as their skills increase.

iii. Competitive forces due to trade liberalisation and shift from centralised wage bargaining to enterprise bargaining has lowered NAIRU.

iv. Hysteresis, because increase in unemployment leads to skill atrophy and eventually the insiders would have to lower NAIRU because of pressure from outsiders. iv. Last but not least, surges and slumps of productivity could also affect NAIRU through changes in workers wage aspirations. Friedman also demonstrated that any attempt by policymakers to keep unemployment rate from the natural rate will only generate an ever accelerating natural rate of unemployment in the short-run. However, in the long-run there would be no tradeoffs between inflation and unemployment and the Phillips curve would be vertical at the natural rate of unemployment.

The TV-NAIRU model or the RW NAIRU model conceptualised by Staiger and Watson (1997) can be specified in terms of the signal or measurement equation (1) and a state or a RW transition equation (2) as given below:

$$[\Delta\pi]_t = \beta(L)\,[\Delta\pi]_t(t-1) + \gamma(L)(u_t(t-1) - u^{\dagger *}) + \delta(L)\,X_t t + \varepsilon_t(t)\,,$$
$$\varepsilon_t \sim N(0, \sigma_\varepsilon^2) \quad (1)$$
$$u_t^* = u_{t-1}^* + \eta_t, \eta_t \sim N(0, \sigma_\eta^2) \quad (2)$$
$$\textit{where,} \qquad \textit{signal to noise ratio } \lambda = \frac{\sigma_\eta^2}{\sigma_\varepsilon^2}$$

In order to obtain MLE of parameters of the above unobserved components structural time series model follow the procedure indicated below:

TV - NAIRU model is estimated from the system of equations comprised of Eq.(1) , the triangle model of the Phillips curve and Eq.2 which specifies as a RW.

The time-profile of NAIRU and Ugap is estimated using the State Space (SS) methodology by applying the KF to obtain the unobserved of the state vectorising MLE techniques. The empirical analysis of the triangle model of the Phillips curve and TV-NAIRU to obtain time-profiles of NAIRU and Ugap and optimal

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estimates of the hyperparameters require the implementation of three operations:

Operation 1: Convert the system of Eq. 1 and Eq. 2 specifying the Phillips curve and RW NAIRU into(SSF) to facilitate the estimation of time-profile of the unobserved components of the state variables (NAIRU, UGap) using the Kalman Filter.

Endnote 4: provides algebraic expose of State Space methodology.

Operation 2: The Kalman Filter (KF) is a powerful recursive algorithm that facilitates the optimal estimation of state variables. The KF also facilitate the computation of predictions and smoothing estimates of unobserved components of the state variable state variable updating prediction and smooth estimates using all the available information/ estimates for the prediction and smoothing of the unobserved components of the state vector.

Endnote 5 : provides an algebraic expose of the KF

Operation 3: The KF provides prediction error decomposition of the log-likelihood function which provides MLE of parameters state vector and hyperparameters.

Endnote 6: provides an algebraic expose of the calculation MLE for the model parameters using prediction error decomposition based on the Kalman Filter (Kalman 1960). The KF has been widely used in determining the navigation path of space shuttles, intercontinental ballistic missiles and drones. In this paper we have used the terminology of Harvey (1989) to describe SSF, methodology and the KF. . The same ground is also covered by in the text-books of Hamilton (2007).Commandeur and Koopman (2007). and others.

a) Estimation Issues

There are three specifications issues that needs to be addressed in order to obtain meaningful TV-NAIRU estimates from the triangle model of the Phillips curve: They are:

i. The simultaneity bias problem
ii. Inflation expectations problem
iii. The 'pile up' problem.

i. All the right hand variables of the triangle model, Eq. (1) should be entered as lagged and not contemporaneous in order to avoid simultaneity bias in estimating the single equation triangle model.

ii. The specification of inflation expectations in the triangle model, Eq. (1) is not model endogenous and therefore, ad hoc. Since inflation has a unit root (see Table 4), we assume adaptive expectations i.e. $\pi^e_t = \pi_{t-1,}$ 1, this provides the justification for the estimation inflation in first differences or $\pi^e_t = \pi_{t-1,}$ π^e_tt -1,).

iii. The 'pile up' problem

The size of the signal-to-noise ratio $\lambda = \sigma_\eta^2/\sigma_\varepsilon^2$) is the key determinant of the smoothness of the time-profile of NAIRU and Ugap / Ifσ_ε^2 2 =0 then λ =0 and the TV-NAIRU model collapses into the constant NAIRU model therefore, obtaining an appropriate value for λ that can yield a time profile for NAIRU and Ugap that will be provide useful information for monetary policy design is imperative.

In the estimation of the unobserved components model specified in Eq.(1) and Eq. (2) above due the presence of nonstationary state variables, the MLE of the signal –to-noise ratio λ has a point mass of zero even when the true value exceeds zero (Gordon 1997). The various estimation issues encountered in measuring in estimating an appropriate value for overcome this problem by imposing an appropriate value for λ that yields a time-profile for NAIRU that is not over-smoothed.

Therefore some practitioners of State Space modelling fix thereby altering the signal-to-noise ratio (λ),by changing the magnitude of the non-zero elements of Q. In this paper we set f Q to be approximately 0.4. The elements of the variance-covariance matrix $\lambda$are set at a large value, 4, reflecting the uncertainty surrounding the true value of NAIRU .In imposing a value λ we follow the methodology of Laubach (1997). An alternative method of estimating the signal-to-noise ratio λ, using the median unbiased estimates of the variance (($\sigma^2\eta$) has been mooted by (Watson 1998). But this method results in wide confidence intervals for the MLE estimates of λ rendering them more unreliable than the method of imposing a value for λ.

Because inflation is always and everywhere is regarded as a monetary phenomenon, theoretically the specification of inflation in terms of changes focuses attention on the real short-run trade-offs and obviates the need to explain the role of nominal factors that come into play if inflation had been specified in level terms (Fabini and Mestre (2001)

Table 4 reports the results of the ADF and PP tests that confirm that inflation has a unit root.

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Table 4 : Unit Root Tests

Test	π	p-value	CV 5%	CV 1%	Order I
ADF t-stat	-1.6542	0.0210	-1.9422	-2.5534	I(1)
	$\Delta\pi$				
ADF t-stat	-10.0747	0.0000	-1.9422	-2.5534	I(0)
Test	π	p-value	CV 5%	CV 1%	Order I
PP test	-2.5501	0.0000	-1.9422	-2.5534	I(1)
	$\Delta\pi$				
	-22.5762	0.0000	-1.9422	-2.5534	I(0)

An important stylised fact that has been observed Is the co-movement of productivity and the natural rate (NAIRU) over the sample period 1978Q3-2011Q1 for Australia, yields a high significant negative correlation (see Table 5).

Table 5

Covariance Analysis: Ordinary
Date: 10/09/12 Time: 13:57
Sample: 1978Q3 2011Q1
Included observations: 131

Correlation
t-Statistic
Probability

	PROD	UN
PROD	1.000000	

UN	-0.682328	1.000000
	-10.60091	-----
	0.0000	-----

r = -0.68, |t| =10.60, p=0.0000

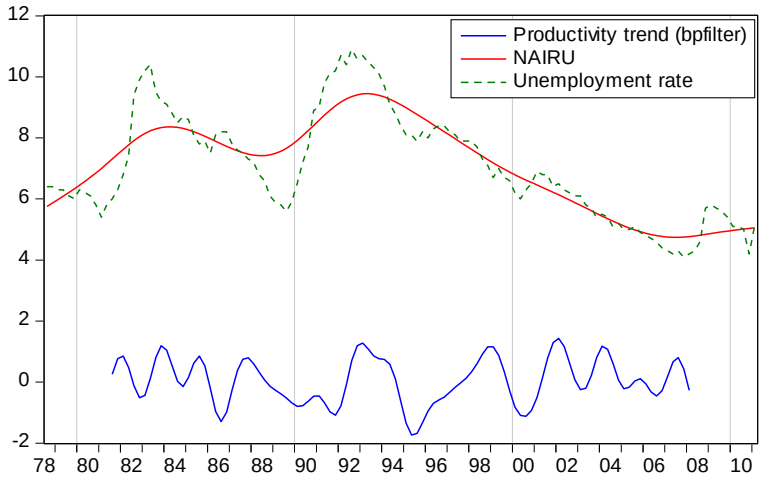


Figure 5

Table 6 : Decade-wise Averages: Productivity, NAIRU, Unemployment, Inflation & UGAP

Trend	80Q1-90Q1	90Q1-00Q1	00Q1-10Q1	10Q1-11Q1
Productivity growth	0.25	0.09	-0.02	0.14
Unemployment rate	7.27	7.28	7.86	6.78
Inflation	1.94	2.04	1.87	2.19
UGAP	-0.39	-0.37	0.05	-0.67

Productivity growth trends reported in Table 6 indicate that after recording a surge over the decade 1980s revealed dramatic slump in productivity in the 1990s decade. In the first decade of 2000 productivity turned negative and indicates a pick-up in decade 2010.

The average unemployment rate remained fairly constant in the 1980s and 1990s decade before recording a rise in the 2000 decade and then falling by more than 1% in the decade 2010. The inflation rate increased in 1990s compared to the 1980s decade.

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Table 7 : Max, Min & AVG recorded over the sample period

	Max	Min	AVG
NAIRU	1993Q2 9.5	2007Q3 4.7	7.7
INFL	1993Q2 4.1	1998Q4 -0.3	1.9
UNE	1992Q3 10.9	2010Q4 4.2	7.4
PROD	1992Q3 3.2	2008Q1 -3.6	0.9

During the 1990s NAIRU peaked at 9.5% in 1993Q2 and the declined to 4.7% in 2007Q3 recording an average of 7.4% over the sample period. The unemployment rate (U) varied in sympathy with NAIRU reaching a peak of 10.9% in 1993Q2 and falling to 4.2% in 2010Q4 yielding an average rate of unemployment of 7.4% for the sample period.(See Table 7).

The reduction in NAIRU and unemployment rate failed to demonstrate the expected negative Phillips curve tradeoffs between the inflation rate and the unemployment rate. It could be conjectured that simultaneous rise in the inflation rate, the unemployment rate and the natural rate (NAIRU) lead to a breakdown of the conventional Phillips curve tradeoffs could be argued to be the result of the flattening of the Phillips curve due to impact of the productivity slowdown in the decade 2000s due to terms-of-trade effect generated by the mining boom..

iv. The Productivity Augmented TV-NAIRU Model

The Productivity Augmented TV-NAIRU model presented in the paper replaces the assumption that the NAIRU in the TV-NAIRU model is purely driven by an unobserved white noise variable as hypothesised by Staiger and Watson (1997). by the productivity growth augmented triangle model Phillips curve as conceptualised by Ball and Moffitt (2001), Slacalek (2005) and Bryson (2008).. A noteworthy feature of the Productivity Augmented TV-NAIRU model is that workers' real wage aspirations change after a lag with changes in productivity.

The effect of productivity growth on unemployment has theoretical support from the job search literature In this paper we follow Slacelek (2005) and postulate that productivity growth has two competing effects: i. The 'capitalisation effect' –where higher labour productivity growth increases the value of workers to the firm causing an increase in job vacancies leading to a fall in the unemployment rate. ii. The 'creative destruction effect' where old jobs are destroyed and replaced by new jobs due to structural change. This causes a productivity acceleration and shortens the employment duration causing the natural rate to rise. The correlation between these two productivity growth effects and the natural rate is therefore determined by the relative strength of these two effects. The empirical finding of a negative correlation between trend productivity growth and the natural rate indicates that the 'capitalisation' effect dominates the ''creative destruction' effect'.

By incorporating additional information in the form of trends in productivity growth in signal or measurement Eq. (1) the variation in the time-profile in NAIRU can be made a better policy tool to craft the appropriate stance of monetary policy by taking into account the cyclic position of the economy and the impact of exogenous shocks such as the TOT shock and productivity shocks incorporated in the vector Xt. The inclusion of additional variables in the signal equation reduces the uncertainty or unexplained variation as shown by the increase in the variance of λ or λ 2λ.

The estimation of TV-NAIRU from the triangle model of the Phillips curve augmented by productivity variables provide a more robust estimate of the long term trend or time-profile of NAIRU than the estimate of the trend using the Hordrick-Prescott (HP) filter. Since the KF provides an optimal estimator of the trend (minimum mean squared error linear estimator according to Harvey (1989).) .The degree of time-variation or the smoothness of the time profile of NAIRU is governed by the signal-to-noise ratio [] and it also encounters the pile up problem encountered in the RW TV-NAIRU model. The problem can be resolved as before by imposing a reasonable value for [] to derive a time-profile for NAIRU whose smoothness provides useful for policy-makers

The productivity conundrum i.e the surge in productivity while the economy was experiencing a mining boom resulting in increase mineral exports cause the TOT to sky-rocket hypothesised that that the surge in productivity in the 1990s and the slump in productivity in 2000s led to large changes in the unemployment inflation tradeoffs as hypothesised by Ball and Moffitt (2001). During a productivity surge the Phillip curve flattened yielding a favourable inflation unemployment tradeoffs and during a productivity slump the tradeoffs became unfavourable. Ball and Moffit hypothesise that productivity changes causes changes workers 'real wage aspirations after a lag..They introduced inertia into the process of real wage adjustment. Furthermore, it is assumed that wage aspirations (A) are determined not only by contemporaneous inflation and productivity but also by their past levels. Wage aspirations (A) is discounted sum of past levels of productivity growth and a weighted average of past wage increases, where weights decline exponentially. The combination of price-setting and wage-setting equations with adaptive expectations and supply shocks yield the productivity augmented Phillips curve specified below:

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$$\pi_t = \beta(L)\ [\![\Delta\pi]\!]_{\downarrow}(t-1) + \gamma(L)(u_{\downarrow}(t-1)\ -$$
$$[\![u_{\downarrow}(t-1)^{\uparrow}*)]\!]^{\uparrow} + \delta(L)\,X_{\downarrow}(t-1) - f_{\downarrow}t\,(\theta_{\downarrow}(t-1) - A_{\downarrow}(t-1)) + \varepsilon_{\downarrow}(t\ ),$$
$$u_t^{\cdot} = \eta u_{t-1}^{\cdot} + v_t,\ v_t \sim N(0, \sigma_v^2)\ \backslash$$

The productivity augmented Phillips curve implies that inflation declines when productivity exceeds wage aspirations (θt-1-At-1). In the steady state changes in productivity are matched changes in wage aspirations i.e.(θt -= At).but in the short-run changes in productivity could exceed changes in wage aspirations (θt- > At), exerting downward pressure in inflation. We could regard movements in (θt--At) as persistent supply shocks for a given NAIRU.

A productivity surge could lead to the unemployment rate to fall below NAIRU (u <u*) causing real wage aspirations of workers' (A) to increase after a lag, unleashing inflationary pressures. Conversely a productivity slump can depress real wage aspirations (A) to increase leading to deflation requiring an antidote of expansionary monetary policies to achieve stabilisation goals. The productivity paradox associated with the productivity surge in the 1990s and productivity slump in the 2000s affected real wage aspirations. The 'real wage aspirations' produces two separate effects: The first effect, the 'capitalisation effect' that increase in labour productivity by increasing real wage aspirations increases unemployment and generates inflationary pressures. The second, a Schumpeterian type of ''creative destruction effect' truncates duration of unemployment can cause NAIRU to rise.

The information content associated with the trend growth in productivity due to an increase in real wage "aspirations'' can be dichotomised into a 'capitalisation effect' that relates labour productivity negatively to unemployment due to job creation and a Schumpeterian style 'creative destruction effect' that truncates unemployment duration causing NAIRU to rise (Slacalek 2005). A detail exposition of the modelling of how productivity changes affect workers' real wage aspirations and impinge on NAIRU and inflation is given in Endnote 7.

Endnote 7 : Productivity and Wage Aspirations

In the next section we present empirical findings related to the productivity augmented Phillips curve for Australia for the sample period 1978Q3-2011Q1.

b) Australian Empirics from the Productivity Augmented Phillips Curve

A decade-wise analysis of Phillips curve tradeoffs reveal the existence of negative trade-off between inflation and unemployment. In the 1990s the productivity surge was associated with a growth rate of 2.18% p.a. way above the benchmark trend productivity growth rate of 1.5% for the sample period under study. During the productivity surge decade of the 1990sinflation decreased while employment increased. These empirics lend support to the 'wage aspiration' hypothesis that contends that increase in productivity reduces inflation because employment increases after a lag due inertia or the slow adjustment of real wage aspirations to actual real wages. In the 2000s decade of the productivity slump, the short-run tradeoffs between inflation and unemployment became more unfavourable because productivity growth slumped to 1.39% per annum, below the 1.5% trend productivity growth rate. During this period the unemployment rate was higher by 1% when compared to the productivity surge period and inflationary pressures gathered momentum but inflation declined due to strong inertia in wage aspirations (see Table 11).

Table 11: Percentage change in Productivity, Unemployment and & Inflation

Decade	Productivity	Unemployment	Inflation
1980s	1.18	6.12	7.94
1990s	2.18	8.93	2.27
2000s	1.39	7.72	3.12

The reduction in the gap between the unemployment rate and inflation rate during the episode of productivity slump in 2000s compared to its increase the episode of productivity surge of the previous decade of the 1990s is depicted in Figure 7,. These findings support the contention that the productivity slump worsened the short-run Phillips curve tradeoffs in 2000s and improved during the productivity surge in the 1990s support the predictions of the wage-aspiration hypothesis See. Figure 7 for the changes in the gap between inflation rate and unemployment rate.

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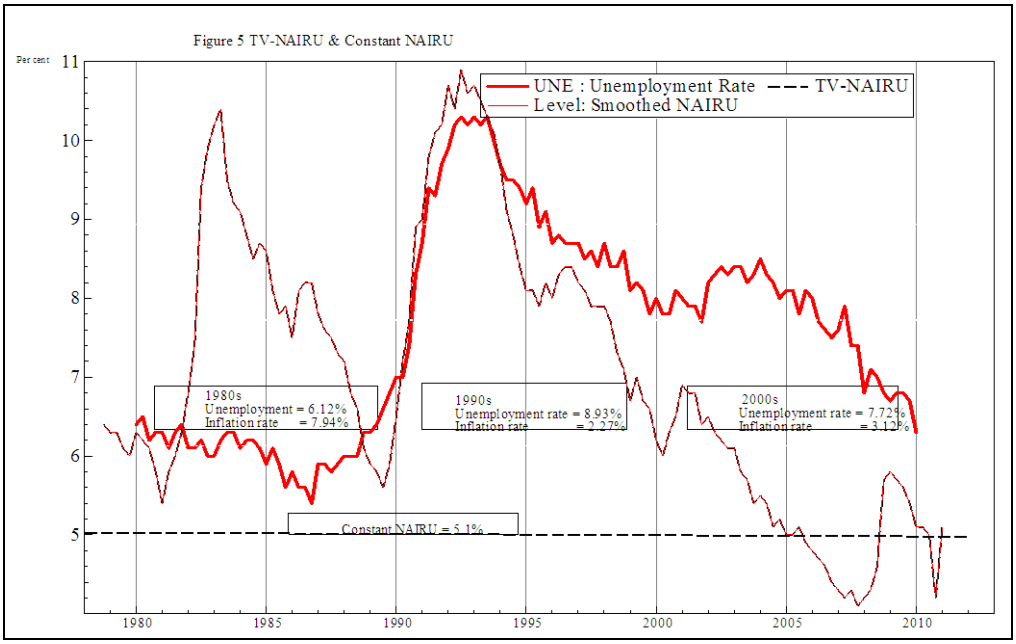


Figure 7

The recursive estimation of the 'wage aspiration' term (A) in Eq.(iii) has been obtained using as the initial value the starting value of the HP filtered trend of the real wage growth rate series. The discount parameter β is set equal to 0.95. Here we follow closely the procedures of Ball and Moffitt (2001) and derive the target level of real wage growth in Eq. (vii) and Eq.(viii). The difference (θ -A) and the smoothed HP trend are shown in Figure. 8. The negative trend implies that productivity (θ) has exceeded wage aspirations (A) during the mining boom not by much. This could be attributed to the strong inertia of wage aspirations that occurred during this productivity surge period.

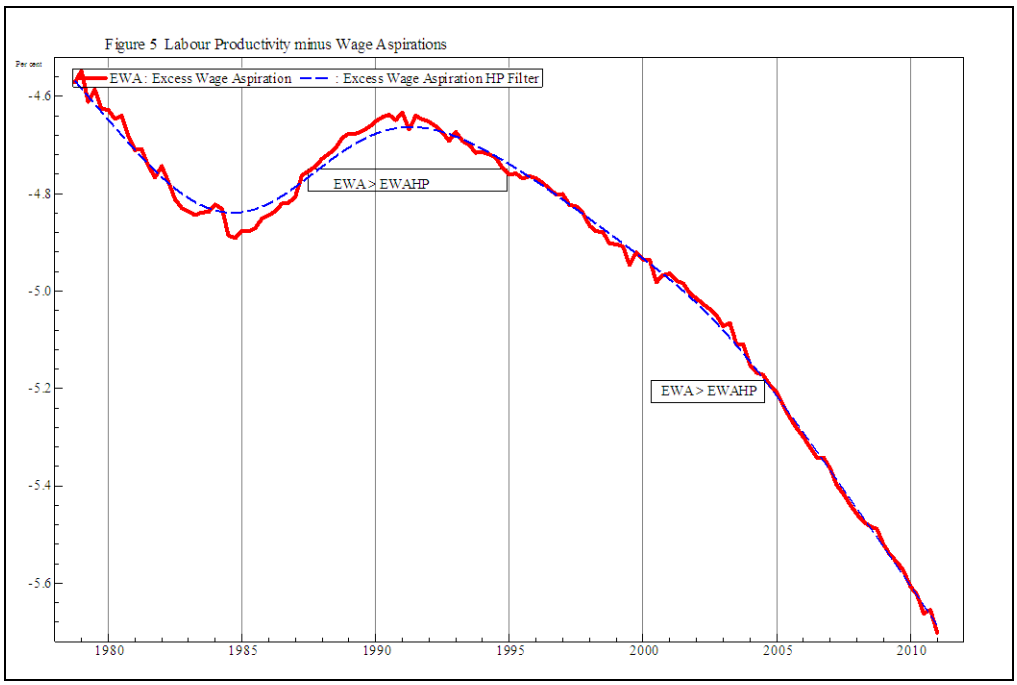


Figure 8

The empirics of the univariate and bivariate Phillips curve tradeoffs incorporating productivity and TOT shocks shed further light on the nexus between productivity ' wage aspirations' hypothesis during the mining boom. The "wage aspirations" augmented productivity shock were estimated using the KF. These

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estimates indicate that the unemployment gap (Ugap) was higher in the bivariate models than in the univariate models. See Table 9 below.

Table 9

Variable	Mean	Standard Deviation
Unemployment rate (u)	7.056	1.7661
NAIRU (un)	7.056	1.4679
Unemployment Gap (ugap)	9.76E-14	0.7656

Therefore the bivariate model estimated using the KF indicates that when the TV-NAIRU that follows a RW with drift the unemployment gap emerges as more robust leading indicator providing useful information for the design of the appropriate monetary policy stance to achieve internal balance. The coefficient of the unemployment gap in the bivariate model is -1.40 compared to the lower coefficient of -1.36 for the unemployment gap in the univariate model. Both models pass a battery of diagnostic tests and the bivariate model appear to give a better fit than the univariate model according to the log likelihood statistic. These empirical results confirm that the inclusion of information on the changes in "wage aspiration" effects (A) that are caused changes e productivity shocks and the exogenous TOT shocks improve the usefulness of the unemployment gap (u*-u) as a useful indicator for the designing monetary policy to achieve the inflation targeting goals in a SOE. The MLE of the state variables and the hyperparameters for the sample period under are consistent with conjectures of the wage-aspirations hypothesis. See Table 12

Table 12

Ox Professional version 6.10 (Windows/U) (C) J.A. Doornik, 1994-2010 STAMP 8.30 (C) S.J. Koopman and A.C. Harvey, 1995-2010 Univariate Model Phillips Curve augmented with productivity & TOT shocks OLS UC(1) Estimation done by Maximum Likelihood (exact score) The database used is E:\ABSDAT.in7 The selection sample is: 1978(4) - 2011(1) (T = 130, N = 1 with 1 missing) The dependent variable Y is: DLCPI The model is: Y = Irregular + Log-Lik -126.55 (-2 LogL = 253.11). Prediction error variance is 6.16417 Summary statistics DLCPI T 129.00 p 4.0000 std.error 2.4828 Normality 84.224 H(42) 0.38629 DW 2.0239 r(1) -0.023638 q 14.000 r(q) 0.12129 Q(q,q-p) 7.1827 R^2 0.54997	Bivariate Model Phillips Curve augmented Productivity &TOT shocks with NAIRU as a RW with drift UC(2) Estimation done by Maximum Likelihood (exact score) The database used is E:\ABSDAT.in7 The selection sample is: 1978(4) - 2011(1) (T = 130, N = 1 with 1 missing) The dependent variable Y is: DLCPI The model is: Y = Trend + Irregular + Cycle 1 + Cycle 2 + Explanatory vars Steady state..... Log-Lik -125.506 (-2 LogL = 251.012). Prediction error variance is 5.76514 Summary statistics DLCPI T 129.00 p 6.0000 std.error 2.4011 Normality 81.732 H(41) 0.37757 DW 2.0573 r(1) -0.033377 q 16.000 r(q) -0.053698 Q(q,q-p) 7.7865 Rd^2 0.46190
Cycle other parameters: Variance 1.06253 Period 16.45934 Period in years 4.11483 Frequency 0.38174 Damping factor 0.86826 Order 1.00000 State vector analysis at period 2011(1) Value Prob	Cycle other parameters: Variance 1.43063 Period 20.99076 Period in years 5.24769 Frequency 0.29933 Damping factor 0.82429 Order 1.00000 State vector analysis at period 2011(1) Value Prob

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Cycle 1 amplitude 0.06753 [.NaN]

Regression effects in final state at time 2011(1)

	Coeff	RMSE	t-value	Prob
UGAP_1	-1.3633	0.3717	-3.6669	[0.0003]
DLTOT_1	-0.00112	0.02140	-0.05237	[0.95832]
EWA_1	-2.73238	1.13363	-2.41030	[0.01738]

Level 44.21087 [0.00001]
Slope -0.11076 [0.00000]
Cycle 1 amplitude 0.00000 [.NaN]

Regression effects in final state at time 2011(1)

	Coeff	RMSE	t-value	Prob
UGAP_1	-1.4066	0.3795	-3.7060	[0.0003]
DLTOT_1	-0.0007	0.0214	-0.03381	[0.9730]
EWA_1	-8.46105	1.75694	-4.81580	[0.00000]

V. Concluding Observations

Designing monetary policy to achieve goals of internal and external balance in a small open economy on the crest of mining boom is a challenging task. In the previous section we have presented three benchmark models of NAIRU that could provide useful information on time-varying NAIRU and Ugap that would guidelines designing the monetary policy stance at various stages of the business cycle. A special focus of the analysis was the effect of wage aspirations to fluctuations of productivity in response to the mining boom albeit with inertia.

The design of monetary policy in small open economy evolving through a mining boom has to confront many other complex issues than the ones focussed on in this paper.

A major issue that arises in relation to the linearity or nonlinearity (convexity) of the triangle model of the short-run Phillips curve. Empirical studies have demonstrated the Australian Phillips curve is convex and linear like US Phillips curve (Debelle and Vickery 1998)..It could be conjectured that convexity of the short-run Phillips curve is caused by AD exceeding AS resulting in the overheating of the economy because it has hit capacity constraints due to infrastructure bottlenecks and skill shortages, thereby unleashing inflationary pressures. The convexity of the Phillips curve rests on firm New Keynesian micro foundations that attributes the convexity due to phenomena such as menu costs, efficiency wages, downward rigidity of nominal wages. (Ball et al. 1988). Nonetheless, dissenters have argued that short-run Phillips curve is concave rather than convex due to the prevalence of monopolistic competition (Eisner 1996) and the effects of information asymmetries (Stiglitz 1997),

The linearity or convexity of the short-run Phillips curve offers widely differing perspectives on NAIRU has implications for NAIRU and design of monetary policy to achieve goals of stabilisation as illustrated using Figure 9. Here, PP' represents the short-run Phillips curve and NAIRU is given by u*. A comparison of points L and L' indicates that one percentage point increase in inflation results in smaller Ugap (u-u) that is smaller in size than the gap =(u2 –u)* required to reduce inflation by one percentage point. A one percentage positive inflation shock causes the natural rate of unemployment, determined by the point of intersection of the LL' –curve and the x-axis to be greater than NAIRU (u*) by α. Here, α is the difference between NAIRU and the natural rate . Larger the inflation shock, larger will be the shift of LL' to the right giving a larger α (the deviation of NAIRU from the natural rate)(Debelle and Vickery 1998).

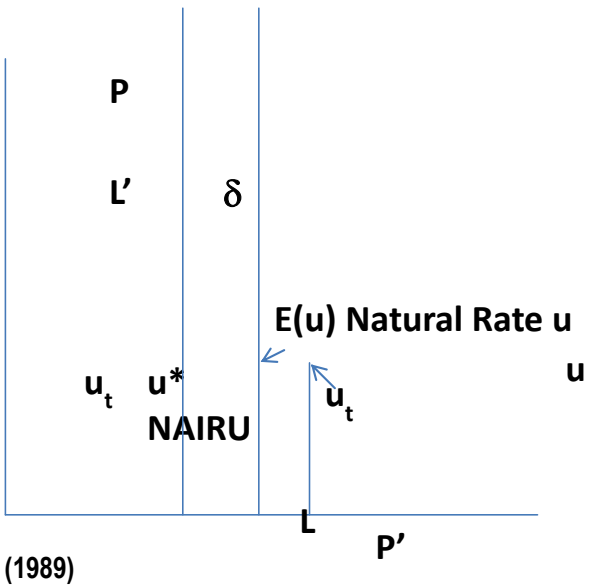


Figure 9

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The convexity of the short-run Phillips curve has significant implications for the design of monetary policy. If the Phillips curve was linear then when $u < u^*$ then stance of monetary policy should be contractionary while monetary policy stance should be expansionary when $u > u^*$. Nonlinearity requires that policymakers should overcome more complexities. If the short-run Phillips curve was convex and monetary policy is slow to respond to counter inflationary pressures arising from $u < u^*$, then u may have to be (Kalman RE. 1960) higher than u^* for longer period than had $u > u^*$. The convexity of the short-run Phillips curve underscores the need forward looking or pre-emptive monetary policy to counter inflationary pressures that could result in costly recessions down the track. Convexity also requires that deep recessions should be avoided as they are costly. Therefore, rather than the 'cold turkey' approach to disinflation favoured by (Ball 1994). a gradualist approach would be less costly and preferable. Notwithstanding, the eventual success of monetary policy in achieving the goals of stabilisation will depend on the credibility of actions of the central bank or policymakers.

Therefore, the locus of TV-NAIRU and the size of Ugap required to achieve the monetary policy stabilisation goals such as inflation targeting will crucially depend on issues of endogenous policy credibility which have not been analysed in this paper. In order to achieve the goals of inflation targeting many central bankers either overtly or covertly draw guidelines from simply policy reaction functions in the shape of the Taylor rule.

The Taylor rule prescribes that the policy instrument (the overnight cash rate or short term interest rate) should be adjusted in response to either deviations of output from potential (the output gap) and/or the deviation of the observed inflation rate from the target rate in order to keep inflation within the prescribed target zone (Taylor 1993).. Recent research indicates that Taylor rule can be outperformed by inflation forecast based (IFB) rules which adjust the policy instrument of short-term interest rate in response to the output gap and deviation of the inflation rate from an inflation forecast, rather than the inflation target. Such inflation forecast rules have a crucial hallmark of inducing authorities to set the short-term interest rate/overnight cash rate on the basis of future inflation forecasts and are referred to inflation forecast based (IFB) rules rather than inflation target rules as subsumed in the Taylor rule, Inflation forecast based (IFB) rules. This paper does not explore how policy rules perform in models with endogenous policy credibility, NAIRU uncertainty and the convexity of the Phillips curve. Policymakers and central bankers are fully cognizant of the need to take account of the features referred to in designing robust monetary policy reaction functions that take account of endogenous credibility because at least theoretically they predict they outperform simple rules that gloss over such information (Laxton and Eliasson 2001). The task of designing robust monetary policies to cope with inflationary pressures in a small open economy in the throes of mining boom bristle with complex challenges as adumbrated in the concluding observations. The paper's main contribution is confined to shedding light on the designing of plausible stance for monetary policy to prevent the productivity gyrations emanating from a mining boom from turning into a resource curse.

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Abbreviations

Abbreviations	
ABS	Australian Bureau of Statistics
ACF	Autocorrelation Function
ADF	Augmented Dickey Fuller
AIC	Akaike Information Criterion
AWE	Average Weekly Earnings
BIC	Bayes' Information Criterion
CAP	Capital Services
DUP	Directly Unproductive Activity
EMP	Employment
Chindia	China India
GDP	Gross Domestic Product
GF	Gordon Filter
GLS	Generalized Least Squares
GNI	Gross National Income
HET	Heteroscedasticity
HP	Hordrick -Prescott Filter
KF	Kalman Filter
LJ-Box	Ljung -Box Statistic
LLH	Log Likelihood
LLM	Local Level Model
LTM	Local Trend Model
MLE	Maximum Likelihood Estimates
NAIRU	Non Accelerating Inflation Rate of Unemployment
NID	Normal Independent Distribution
NORM	Normal Distribution
OLS	Ordinary Least Squares
PROD	Labour Productivity
PP	Phillips Perron
RBA	Reserve Bank of Australia
RW	Random Walk
SCI	Structural Change Index
SOE	Small Open Economy
SSF	State Space Form
STM	Structural Time Series Models
TFP	Total Factor Productivity
TOT	Terms of Trade
TV	Time-Varying
Ugap	Unemployment Gap
UNE	Unemployment Rate
US	United States

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Figures

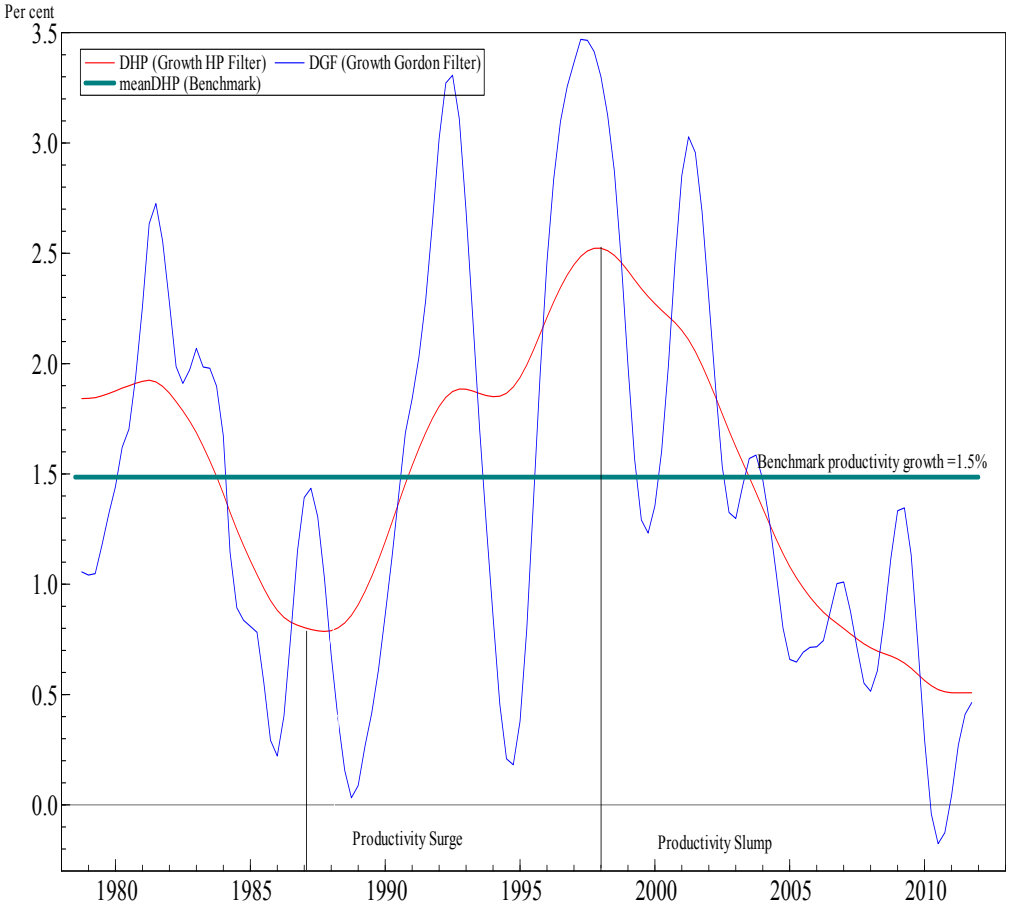


Figure 1 : Trends in Producting Growth – The Produtivity

Notes: The HP Filter (Hordrick and Prescott 1997) assumes that the time seriesf yt = log of labour productivity can be deccomposed into a trend and cyclical component. By minimizing the loss function L: over the sample size S: yielding the deviation of productivity

$$L = \sum_{t=1}^{S} (y_t - y_t^*)^2 + \lambda \sum_{t=2}^{S-1} (\Delta y_t^* - \Delta y_{t-1}^{*T})^2$$

From its trend in the first term and the variability of the trend in the second term. The relative weight assigned to the two terms is given by the smoothness parameter □.The smoothness of the trend increases with the magnitude of □. For a quarterly time-series is assumed that □=1600 in deriving the HP filter. Gordon (2003) in the Gordon filter (GF) assumes that □ =32.

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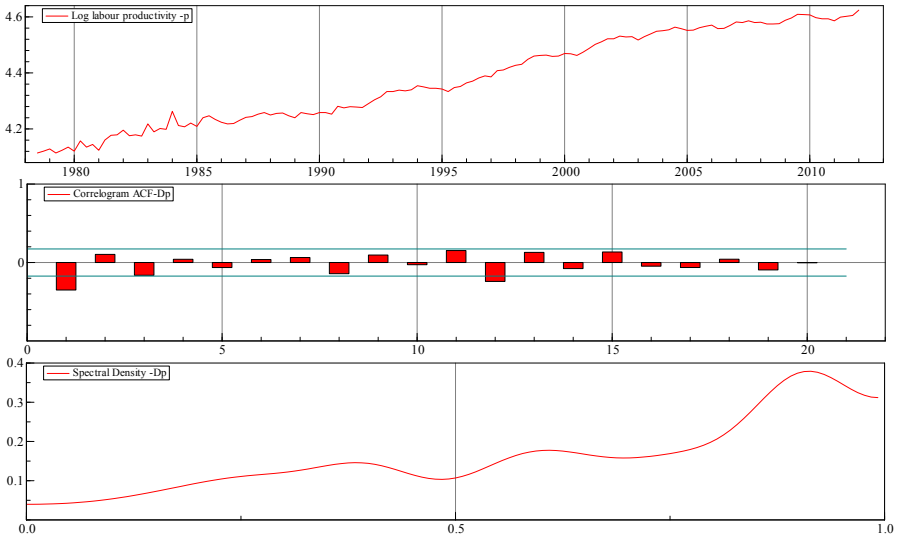


Figure 2 : Trend of Log Labour Productivity , Correlogram and Power Spectrum of Dp

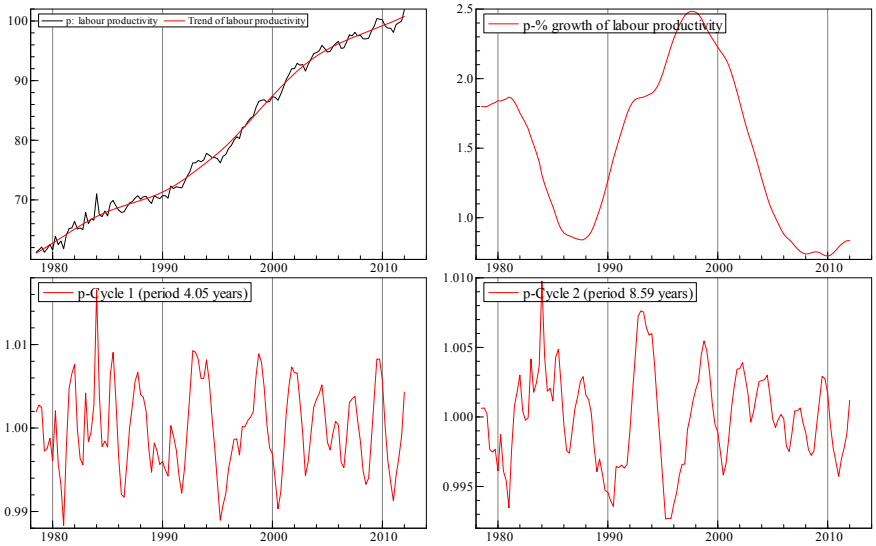


Figure 3 : Unobserved Components of Labour

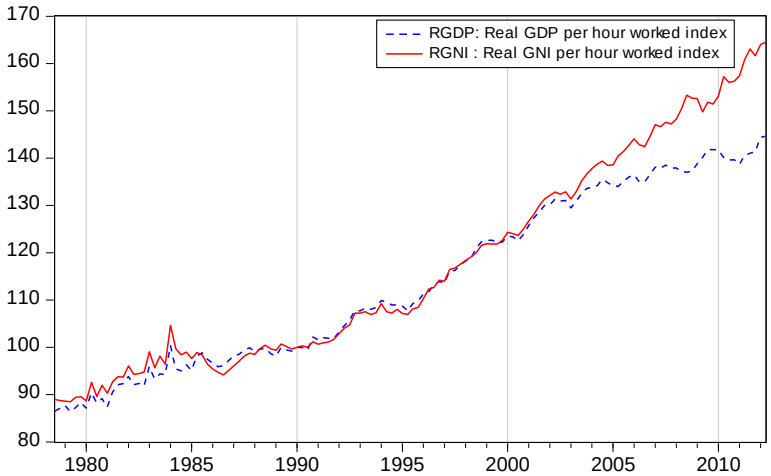


Figure 4 : Indexes of Real GDP and Real GNI per hour worked.

Source: RBA & ABS

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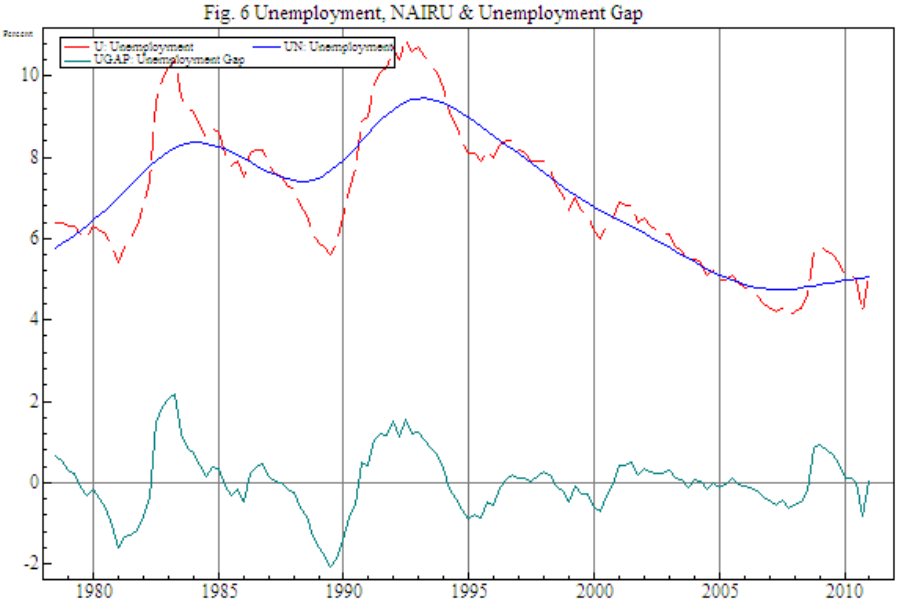


Figure 6 : Unemployment,

Tables

Table 10 : Empirics of the 'triangle ' Phillips Curve model'

Sspace: MIGUEL
Method: Maximum likelihood (Marquardt)
Date: 10/03/12 Time: 18:05
Sample: 1978Q3 2011Q1
Included observations: 131
Partial observations: 3
Convergence achieved after 104 iterations
WARNING: Singular covariance - coefficients are not unique

	Coefficient	Std. Error	z-Statistic	Prob.
C(1)	-9.192368	NA	NA	NA
C(2)	1.513653	NA	NA	NA
C(3)	0.921892	NA	NA	NA
C(4)	-1.365266	NA	NA	NA
C(6)	-36.83538	NA	NA	NA
C(8)	0.996537	NA	NA	NA
C(9)	0.992828	NA	NA	NA

	Final State	Root MSE	z-Statistic	Prob.
UGAP	-0.784987	0.632456	-1.241173	0.2145
UN	5.845487	0.447214	13.07091	0.0000

Log likelihood	-265.9055	Akaike info criterion	4.166496
Parameters	7	Schwarz criterion	4.320132
Diffuse priors	0	Hannan-Quinn criterion.	4.228925

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Global Journal of Management and Business Research: B
Economics and Commerce
Volume 14 Issue 2 Version 1.0 Year 2014
Type: Double Blind Peer Reviewed International Research Journal
Publisher: Global Journals Inc. (USA)
Online ISSN: 2249-4588 & Print ISSN: 0975-5853

The Impact of Small and Medium-Sized Enterprises on Economic Growth in Iran

By Abdollah Rahimlou Benis
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Abstract- In the aftermath of the global financial crisis of 2008- 2009, there has been an increased interest in the role of small and medium enterprises in job creation and economic growth. Changing industrial structures of developing economies in recent decades, the development of small and medium-sized enterprises (SMEs) were playing a critical role in industrial development strategies of countries. Regarding the successful experience of newly developed economies, economists believe that private sector, particularly SMEs, is a significant factor in economic growth in developing countries. Researches show that these industries affect economic growth by entrepreneurship, innovation, and creating new job opportunities. As a result, SMEs have been concentrated in Iran in order to develop employment-making activities. This research study the relationship between SMEs and economic growth in Iran provinces by using mixed data during 2004- 2005 in the framework of augmented Solo growth model, and panel data method. Results show a positive and significant relationship between developing SMEs and economic growth, which indicates the importance of SMEs

Keywords: *small and medium-sized enterprises, economic growth, panel data model.*

GJMBR-B Classification: *JEL Code: D92 . E24 . G18 . O43*



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The Impact of Small and Medium-Sized Enterprises on Economic Growth in Iran

Abdollah Rahimlou Benis

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Keywords: small and medium-sized enterprises, economic growth, panel data model.

I. Introduction

Enormous changes have been occurred in global markets in last two decades. Markets have shifted from local to global environment and concurrently production orientation has shifted to customer orientation. In order to optimum usage of resources, manufacturers have thought of changing in industrial structure. One of the notable characteristics of this structure is the increasing development of SMEs.

Although SMEs have many similarities among different countries, there is no uniform definition for that. Each country presents a quantitative and a qualitative definition of these types of businesses according to indicators of employment, capital volume, production volume and technology. Most of these definitions are along with quantitative criteria such as number of employees and turnover (Research Center of Iranian Parliament, 2006).

There is no nationally accepted definition for SME. Different ministries and departments have presented different definitions. The common indicator in different definitions is the number of employees (Research Center of Iranian Parliament, 2006).

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According to the ministry of industry and mine and ministry of agriculture, SMEs are production or services units (urban or rural) with less than 50 employees (Unido, 2004). Statistical Center of Iran has divided the business into four groups: businesses with 1 to 9 employees, businesses with 10 to 49 employees, businesses with 50 to 99 employees and businesses with more than 100 employees. Statistical Center of Iran defines SMEs as businesses with less than 100 employees and large-sized Enterprises as businesses with more than 100 employees.

Before 1964, industry in Iran had been categorized to new large industries and old crafts which had been inherited from old craftsman to their Childs. Iran industry contained handicrafts such as: weaving, spinning, pottery, key and lock making, blacksmithing and above all carpet weaving The industry which was imported to Iran by following industrial countries was considered as large-sized industry. The divisor between these two industries was an industry that had been established in the country to supply some needs of modern products such as repairing garages and lathing shops that could somehow cover the need of repairing ad correcting some of the machineries imported from industrial countries. Apart from these, there were slight industries which could be indicated as a SME. The first step to promote and expand modern SMEs was taken in the middle of 1964. At that year, the government decided to establish an organization named "the organization of industrial zones. That organization became the main in charge of planning and establishing industrial zones in different parts of the country and at the same time a sample industrial zone was established in Ahvaz by the help of the unitednations.

The experiences gained by the organization of industrial zones during several years led to a total revision of the process of developing SMEs. In 1970, the government decided to replace the organization of industrial zones with "the organization SMEs and industrial zones of Iran" with more responsibilities and wider activity fields to perform a broad project of developing SMEs, duo to the necessity of developing SMEs and the project of implementing financial supporting schedules and preparing modern facilities for factories in the form of industrial zones or necessary infrastructures.

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This action became the main factor of planning and performing multilateral supporting projects of the SMEs in the country. These changes continued up to now that SMEs are working as a part of the Ministry of Industry, Mine and Commerce (Gharecheh, 1998).

Surveying the performance of SMEs in Iran economy during the third national development plan compared to the duration of the second development plan indicates that the role of medium-sized enterprises in Iran industries has been increased, by the relative increase of the numbers of these types of enterprises. As shown in table 1, SMEs in Iran in the period of 2004-2006 have covered more than 86% of the whole industries.

Table 1 : the percentage of small, medium and large sized enterprises during 2004-2006

year	2004	2005	2006
Small Enterprises	75%	76%	75%
Medium Enterprises	11%	11%	11%
Large Enterprises	14%	13%	14%

Because of the increasing role of SMEs in development and employment, this article is to study the effects of SMEs on the economic growth in Iran in six sections. The second section is about the economic importance of these enterprises. The third section contains a brief literature revive and in the forth section theoretical framework of the model is explained. The fifth section is about the model estimation and finally, the last section is the conclusion.

II. The Economic Importance of SMEs

a) The role of SMEs in employment

The issue of creating job opportunities in SMEs was first noticed in the USA. This issue was widely debated at the end of the 1970`s because of the publication of the publication of David Birch`s (1987) research on SMEs. He concluded that large-sized enterprises are no more the main factor in increasing employment, and most of the new jobs were created by SMEs (Majidi, 2004).

According to Snodgrass and Biggs (1996), most of the corporations in low-income countries, are small-sized. In contrast, the majority of production and employment belongs to medium-sized enterprises in medium-income countries. Generally, countries with high income per-capita intend more toward large-sized enterprises.

Regardless of the development level of an economy, a considerable amount of SMEs are active in unofficial sector. Schnider (2003) compared the share of unofficial sector in GDP in 22 developing countries (The former Soviet, Central and Eastern Europe) and 21 countries among the members of the organization for economic co-operation and development (OECD) during 2000-2002. He concluded that the share of unofficial sector in GDP for OECD members, The Soviet, and the CEE was 16.7%, 29.2% and 44.8% respectively.

Ayyagari et al (2003) carried out an experimental study about 54 countries (13 low-income, 24 medium-income and 17 high-income). They revealed that the share of employment in SMEs in relation to the total employment changed from 32% in low-income countries to more than 65% in high-income countries. In addition, the share of SMEs in GDP had an increasing mode. For example, the share of SMEs in low-income countries is about 15% while in high-income countries is about 52%. These results showed that the rise in the share of SMEs in employment had caused the increase in SMEs` share in GDP.

Considering the influence of unofficial sector in employment and GDP, it has been proved that in low-income countries the share of unofficial sector in employment and GDP is 42% and 47% respectively, compared to the share of unofficial sector in employment and GDP in high-income countries which are 15% and 13% respectively.

According to Ayyagari et al (2003) the relative share of SME sector in employment and GDP is less than that of unofficial sector in low-income countries. Therefore, in developing countries, the politics which lead to separation of official sector from unofficial sector are in priority in order to strengthen poor countries to cooperate in markets and thus to attract these countries to economic activities with high added-value.

Generally, in most of the developing countries more capital has been allocated to SMEs in order to increase the role of the corporation to create job opportunities. As a result, 95% of the corporations in OECD countries are SMEs that have created 60 to 70% of employment. For instance, in Ecuador 99% of corporations have 50 employees or less, which is equal to 55% of the employment (Dawes, 2005).

b) Entrepreneurship, Innovation and Productivity in SMEs

In the evolving world of today, concentration on the matter of entrepreneurship is prevalent among economists, governors and ordinary people. Schumpeter (1934) in the theory of economic development paid attention to the role of entrepreneur as the main actor in surveying the stage of capitalism transformation. In the school of Chicago, Night (1921) emphasized on the performance of the entrepreneur not his characteristics. According to Night, entrepreneur is the one who involve himself in a trade or exchange by the goal of gaining benefits. Economic situations have great effects on forming the entrepreneurship activities. In case of stopping the economic development that causes unemployment, workers are driven to self-development. In contrast, in the time of economic development most of workers are led to establishing

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new businesses, because of the existence of job opportunities and increase on yielding profits in different industries. SMEs do to the nature of their activities on highly dependent on human resources. In fact, the core competency in SMEs is based on an innovative idea and human resources (Dawes, 2005).

According to Beck et al (2005) SMEs are able to innovate in different levels of products by using a small amount of investment in R&D; because these corporations could easily gain achievements of academic researches and the outcomes of large-sized enterprises` R&Ds. In fact, there is a great motivation for innovation and creating new methods in SMEs. Because of the lack of power and capital for starting a large-scale production plan, there is a heavy competition among these types of enterprises. So, they try to improve the old processes and methods with posing an innovative idea in production. They increase their outcomes or introduce new products so that they could get a suitable market share for existing products or to create a new market for their new products. Generally, entrepreneurship and creativity are the essence and the source of SMEs` activities and are considered to be main part of the properties of these enterprises. So, one of the most important policies to develop and reinforce SMEs is concentration on everlasting training and promoting employees` knowledge (Majidi, 2004).

According to researches of OECD (2000) the maximum share of SMEs growth in whole industries was 5 to 10 percent, which had played an important role in economic development. These enterprises have proved their priority by the use of new comers who are exceptional administrators in creating jobs and innovations, though the employment rate in SMEs is more than large-sized enterprises in most of the countries.

Although Roseenberg (1976, 1986) and Baumol (1993) pointed that imported technologies effective drive for technological improvement in developing countries, the important role of SMEs via innovation in developing countries is under debate. However, most of SMEs are not pioneers of innovation and mostly have mixed old technologies. In most of the cases these enterprises are more innovative than large-sized enterprises. For example, analysis show that small-sized enterprises are higher in innovation rate in high-technology industries such as computer. In contrast, larger corporations are more innovative in capital-intensive low-technology industries such as chemistry and food industry (Biggs, 2002). But, some researches (e.g. Pagano and Schivardi, 2001) put emphasize on the benefits of large-sized industries and they challenge the hypothesis of the supporters of the growth of SMEs. They believe that large-sized enterprises could easily cover R&D costs by economies of scale.

III. Literature Review

Beck et al (2002), have done a research entitled "SMEs, development and poverty" about the effects of SMEs on economic growth and decreasing poverty in 45 countries. Their results showed that there is a positive and strong relation between developing SMEs and economic growth. Gebremeedhin et al (2004) found out that there is a positive relation between the relative rate of activities and economic growth, and there is a negative relation between the relative rate of small businesses and the existence of poverty. The results approved that the relation between the development of small businesses, economic growth and decrease in poverty.

Winston Dawes (2005) investigated the effects of SMEs on economic growth and decrease of poverty in the period of 1990 to 2000 in Latin America and Caribbean district. The results showed that SMEs have not positive and strong effects on economic growth decrease in poverty in Latin America and Caribbean district. Results of that research also revealed that the economic power of SMEs in Latin America and Caribbean district could increase by improvement in businesses` environment and decrease of incomes` inequality.

Mohamadi (2004) compared the function of SMEs with large-sized enterprises on industrial development in Iran and also compared the effects of SMEs on Iran economic growth with large-sized enterprises. He concluded that SMEs in Iran had weak effect on growth in most of indicators, despite the dominant number of their companies and employees. Furthermore, the results showed that the growth of both SMEs and large-sized enterprises have a positive effect on economic growth of Iran while the effect of large-sized enterprises had been more.

IV. Theoretical Framework and Model Generation

a) Presenting the model

To study the effect of SMEs on economic growth, Solo-swan neoclassic model of development is used in this research:

$$Y = K^{\alpha}(AL)^{1-\alpha} \quad (1)$$

In which Y represents product, K is physical capital, L is labor, A is the level of technology, and α is the production elasticity of capital input and is in range of 0 to 1. Labor and technology grow with the constant rate of n and g respectively. By dividing both sides to AL, the equation (1) could be written as:

$$y = k^{\alpha} \quad (2)$$

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In which y= Y/AL is the production of any effective element unit of labor, and k=K/AL is the capital of any effective element unit of labor. Solo growth model could be deduced from the equation (2) (Rumer, 2006; Dawes, 2005). By all means, this model had some shortages that the completed Solow model was recommended to remove those deficiencies. This model contain human and physical capital as well. Experimental studies showed that the "Augmented Solow growth model" presents a well interpretation of the sectional data of the countries. The Augmented Solow model is as:

$$y = k^{\alpha} H^{\alpha} (AL)^{1-\alpha-\beta} \qquad \alpha+\beta<1 \qquad (3)$$

In which H is for human capital, A if the level of technology and L represent the saving of labor. The equation (4) in the form of the effective capita is:

$$y = k^{\alpha} h^{\beta}$$
$$h = \frac{H}{AL}, \qquad k = \frac{K}{AL} \quad y = \frac{Y}{AL} \qquad (4)$$

Now, on the basis of the law of Dynamics of H and K:

$$\dot{k}_t = s_k y_t - (n$$
$$\dot{h} = \dot{\kappa} = \circ$$
$$\dot{h}_t = s_h y_t - (1$$

In which s_k and s_h are percentage of production that is invested in K and H. A and L grow in the extrinsic rates of g and n respectively. The depreciation rate of H and K equals to σ_h and σ_k and are extrinsic. According to the theory of descending efficiency of production factors, any economy gains the values of in their $\hbar, \kappa$ constant levels of $\hbar^*$ and κ^*, and at this level . So to put h and k equal to zero, the value of the basic variables in constant level are achieved. By replacing the in the production function and taking logarithm, the growth equation (5) is achieved that shows production depends on the growth of population and accumulation of human and Physical capital:

$$\ln\left[\frac{Y(t)}{L(t)}\right] = \ln A(0) + gt - \frac{\alpha+\beta}{1-\alpha-\beta}\ln(\alpha+g+\delta) + \frac{\alpha}{1-\alpha-\beta}\ln(sk) + \frac{\beta}{1-\alpha-\beta}\ln(sh) \qquad (5)$$

According to Dawes (2005) and Levine et al (2002), development of SMEs could be set in a neoclassic framework by generalization of production function. In other words, the variable of human capital is a mechanism with which SMEs enter the augmented neoclassic model. Considering the human capital to contain the activities such as entrepreneurship, innovation and knowledge dissemination, the equation (6) is used in experimental studies:

$$y_{i,t} - y_{i,t-1} = \alpha y_{i,t-1} + \beta SME_{i,t} + \gamma X_{i,t} + \varepsilon_{i,t} \qquad (6)$$

In which y_t is the logarithm of the real production per capita and the left side is economic growth. SME_i is the number of the SMEs of each province according to the number of employees, X_i is a set of control variables, containing the credits (credits given to each province), training (high-school students of the given province) infrastructures (number of phone lines in each province) and province`s inflation rate. ε is the obstruction segment.

b) Presenting data

One of the explanatory variables of the present research is the number of SMEs in terms of the number of employees. This variable had a descending trend from 2004 to 2005 and 2006 (14368, 14036, 14008 respectively). One of the main reasons for this descending trend could be the increase of the share of these enterprises in credits. The share of SMEs in credits in 2005 and 2006 compare to 2004 had increased 4% and 1% respectively.

The majority of SMEs are concentrated on the province of Tehran (with the share of 27.8%) and the province of Isfahan with the share of 15.11% is following Tehran. While the province of Ilam with the share of 0.22% and the province of Kohgiluye with the share of 0.24 owned the least shares. The highest share of credit in the whole country credit in 2004 was received by Tehran with the share of 51.97% and then Isfahan with the share of 6.85%. The lowest share of credit reception had been for kohgiluye with the share of 0.39%.

In 2005 the number of SMEs was 14036. The share of Tehran with a little decrease in comparison to the previous year was 26.81 % and Isfahan with a little increase got the share of 15.8% which were the highest shares. The province of Ilam and Kohgiluye with the less share compare to the previous year had 0.19% and 0.20% of all share and were at the lowest row. Also, the highest share of credit reception (in the whole country credit) in 2005, the same as 2004, had been for Tehran and Isfahan and the least share was for Kohgiluye.

In 2006, the number of the number of these enterprises decreased to 14008. The share of Tehran with a little increase in comparison with the previous year was 27.75% and is somehow equal to 2004. But, the share of Isfahan with a little decrease compared to 2004 and 2005 was 14.57% which had been the highest share respectively. While, the share of Ilam and Kohgiluye as compared with 2005 had no change, but compare to 2004 had a little decrease. The highest rate of credit reception in 2006, the same as 2004 and 2005 belonged to Tehran and Isfahan while the lowest share belonged to Kohgiluye.

In the case of training (following the method used by Barro (1991) and Baliamoune-Lutz and McGillivary (2007)) high school students of each province were considered as substitutions of human capital. The province of Tehran and Isfahan had the

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highest rate respectively with the share of 18.68% and 6.75%. While Semnan with the share of 0.85% had the lowest share. In 2005 Tehran and Isfahan were in the highest row as well, while Semnan and Kohgiluye had the lkowest share. In 2006, was still at the top and Fars province was following Tehran, while Semnan had the lowest share.

In 2004, in terms of infrastructures the highest share belonged to Tehran with 26.04% following by Khorasan with the share of 11.15%. The lowest share belonged to Chaharmahal and Ilam with 0.66% and 0.67% respectively. In 2005, in terms of infrastructures again the highest share belonged to Tehran and Khorasan and the lowest was for Chaharmahal and Ilam. In 2006, the highest share in infrastructures belonged to Tehran and East Azarbayejan. The share of Tehran had had no change compared to 2005, but had a decrease compared to 2004 and got the share of 20.27%. The province of East Azarbayjan with the share of 6.09% was at the second row. In contrast, the provinces of Ilam and Chaharmahal were at the lowest row.

In terms of inflation in the years of 2004, 2005 and 2006, Fars (19.3%), Kohgiluye (15.3%) and Ilam and Khorasan (15.4%) had the highest share respectively; while during these years Gilan (11.3%), East Azarbayejan (9.3%) and Bushehr (9.6%) had the lowest inflation rate.

V. Model Estimation and Results

In this section, the experimental model presented in the previous section is estimated and analyzed. Again, we emphasize that in present research SME indicates the number of small and medium-sized enterprises in each province of Iran in terms of number of their employees. As the analyzed data belong to the provinces of Iran and in the period of 2004-2006, we face cross-sectional data and time series.

At first step, to distinguish whether this model is a model with fixed effect or random effect, we use Chow test and Lagrange coefficient test. If the results of these two tests were different, then we use Hausman test.

In chow test, H_0 means the existence of mixed data in which the ordinary least square (OLS) method is used to estimate the model. Rejecting H_0 means the presence of fixed effect model and least square dummy variable (LSDV) is used to estimate this. The results of Chow test showed in table 2 confirm the rejection of H0 hypothesis and the presence of fixed effect model.

Table 2 : Results of Chow, Lagrange and Hausman

Test type	χ^2	Sig	Test result
Chow test	16.01	0.00	Fixed effect model
Lagrange test	0.25	0.60	Mixed model
Hausman test	72.67	0.00	Fixed effect model

In Lagrange coefficient test, H_0 means the existence of panel data and its rejection means the existence of random effect model. The results express non-rejection of H_0 hypothesis.

As shown in table 2, the results of these two tests vary. So, there appears a question: how to choose one model from mixed model and fixed model? This problem is solved by using Hausman test. According to Hausman test, H_0 hypothesis means the presence of random effect model and rejecting H_0 means the presence of fixed effect model. As the results of this test can be seen in table 2, H_0 is rejected, so we have a fixed effect model. Therefore, the model surveyed with OLS was fitted by dummy variables (LSDV). The results are presented in table 3. According to the results, the coefficient of SMEs by the number of 0.008 shows the positive and significant effect of this variable on economic growth in different provinces of the country. The cause of the positive effect is relevant to high motivation for innovation and creating new production methods in these enterprises; because these enterprises have not enough power and capital to start a large production project, so there is an intense competition among them. So, the owners of these enterprises try to increase their efficiency by presenting a new production method in order to gain more market share or to create a new market for their products; and the result is economic growth of the country. Also, these enterprises could transform the structure and composition of employment in the country by creating high range of job opportunities.

According to growth model, credits are one of the most important sources to increase economic growth. As shown in table 3, the relation between credit and economic growth is positive and significant. It could be interpreted as one increase in the share of whole credits, causes 0.0005% increase in economic growth. This positive relation has been verified by other researches. According to McKinnon and Shaw (1973) the credits is important in two aspects: first, it leads savings toward investment, which in turn causes production development. Second, according to King and Levine (1993), developing "credits" effects on all productivity factors such as technology level, which in turn causes more production growth in long-term.

Table 3 : the result of model estimation by LSDV

Explanatory Variables	Coefficient	Sig
SME	0.008	0.050
Credits	0.0005	0.001
Logarithm of GDP	-8.080	0.061
Infrastructures (Telephone)	0.0001	0.75
Training	0.0003	0.000
Inflation	-0.500	0.063
Dummy variable	5.270	0.000
y-intercept	-29.88	0.007
R2 = 0.69 F = 7.49		

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One of the patterns that caused a serious change in the literature of economic growth and development since early 1980`s, emphasizes on human development and investment in people abilities. Forecasting such patterns is duo to paying attention to the fact that just countries that had invested on developing people abilities, especially on training, could got to an acceptable level of development. The importance of this key element is that the foundations of production are transformed through the process of socio-economic development. The most important factor in this transformation is the new science and technologies. As results shown, there is a positive and significant relation between investment on training and economic growth which is 0.0003. It means that increasing each high-school student will leads to increasing economic growth by 0.0003%. In the growth literature, negative relation between inflation and economic growth is usually emphasized. In those contexts, that relation is usually investigated by two methods: first, the inflation rate; second, the inflation variability. Regarding first method, it is said that inflation is considered as the tax of investment. So, the high inflation rate, decrease the profitability required to perform an investment project. In general, it has a negative effect on accumulation of financial capital and economic growth. In contrast, some researchers noted that inflation rate increase the cost of money preservation. Its effect on replacement of money with other properties makes changes in the people portfolio stock, and leads to increase in trading durable goods and their prices, and increase in interest rate.

In addition, inflation is generated because of governmental, political and economic structure. This type of inflation is specific to the developing countries and is known as Structural Inflation. Some reasons of inflation in Iran are: the absence of economic infrastructures, usual budget deficit, expansion of services which are misappropriate for the special situation of the country. Interpreting from the results, each increase in inflation rate by one unit, decreases the economic growth of the country by 0.5 percent.

Duo to the estimated model, F= 7.49 shows the significance of the whole regression. Also R^2 proves that explanatory variables of model explain 69% of variance of economic growth variable.

VI. Conclusion

One of the ways of industrial development which has been noticed in recent years in developing countries and even in developed countries is minimizing industries and leaning against the expansion of SMEs as the stimulant of economic and industrial development. According to Unido, the structure of industrial added value in Iran during 2002-2005 had a relative well growth. This issue indicates structural changes in industry of the country in recent years. Studying the activities of small, medium and large sized enterprises in Iran economy during the third national development plan compare to its` previous plan period shows that by relative increase of the numbers of medium enterprises, the role of these enterprises in the output of the industry has increased and this could indicate the restoration of industrial structure from the view of corporation expansion pattern.

Because of the increasing importance of SMEs in growth of employment rate in the world and the country, the effect of SMEs on the provincial economic growth in Iran is studied by mixed data during 2004-2006. To study, the Solow augmented model and estimating method of fixed effect model have been used.

Results of fitting the model showed that SMEs have positive and significant effect on economic growth in the provinces of Iran. This impact has its roots in high motivation for innovation and creating new job opportunities and changing the structure of employment. The credits have positive and significant effect on economic growth as well. This impact is duo to the fact that credits leads savings toward investment from one hand, and affect on the all elements of productivity such as technology level on the other hand. Training is another element that affects the economic growth as well. Results show the positive and significant effect of training on economic growth.

Inflation has different reasons in the different countries. The reasons of inflation in Iran are the absence of the economic infrastructures, usual budget deficit, expansion of services which are misappropriate for the special situation of the country, and the increase of cash amount without backing by production which leads to decreasing economic growth. Results show that each increase in inflation rate by one unit, decreases the economic growth of the country by 0.5 percent.

Nowadays, home businesses are in high importance. Many women and men could work at their homes. Higher capability to create employment, the ability to attract limited and diffused capitals of the society, creating more bases for partnership of private sector, rapid return of investment, less investment-consuming, and more capability to make employment, are of the benefits of SMEs. Developing small and medium-sized enterprises that usually have less than 150 employees could be the healing prescription for a part of unemployment problems in the country. Though small and medium-sized enterprises (that usually expand by a local perspective) do not produce complicated products, they could help the economic development and employment in the country.

Also the expansion of these businesses with consideration of regional situation of any province could

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increase production and decrease unemployment in the provinces. So, the government should adopt solutions with which a suitable platform for the growth and development of SMEs is formed.

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Language: The language of publication is UK English. Authors, for whom English is a second language, must have their manuscript efficiently edited by an English-speaking person before submission to make sure that, the English is of high excellence. It is preferable, that manuscripts should be professionally edited.

Standard Usage, Abbreviations, and Units: Spelling and hyphenation should be conventional to The Concise Oxford English Dictionary. Statistics and measurements should at all times be given in figures, e.g. 16 min, except for when the number begins a sentence. When the number does not refer to a unit of measurement it should be spelt in full unless, it is 160 or greater.

Abbreviations supposed to be used carefully. The abbreviated name or expression is supposed to be cited in full at first usage, followed by the conventional abbreviation in parentheses.

Metric SI units are supposed to generally be used excluding where they conflict with current practice or are confusing. For illustration, 1.4 l rather than 1.4 × 10-3 m3, or 4 mm somewhat than 4 × 10-3 m. Chemical formula and solutions must identify the form used, e.g. anhydrous or hydrated, and the concentration must be in clearly defined units. Common species names should be followed by underlines at the first mention. For following use the generic name should be constricted to a single letter, if it is clear.

Structure

All manuscripts submitted to Global Journals Inc. (US), ought to include:

Title: The title page must carry an instructive title that reflects the content, a running title (less than 45 characters together with spaces), names of the authors and co-authors, and the place(s) wherever the work was carried out. The full postal address in addition with the e-mail address of related author must be given. Up to eleven keywords or very brief phrases have to be given to help data retrieval, mining and indexing.

Abstract, used in Original Papers and Reviews:

Optimizing Abstract for Search Engines

Many researchers searching for information online will use search engines such as Google, Yahoo or similar. By optimizing your paper for search engines, you will amplify the chance of someone finding it. This in turn will make it more likely to be viewed and/or cited in a further work. Global Journals Inc. (US) have compiled these guidelines to facilitate you to maximize the web-friendliness of the most public part of your paper.

Key Words

A major linchpin in research work for the writing research paper is the keyword search, which one will employ to find both library and Internet resources.

One must be persistent and creative in using keywords. An effective keyword search requires a strategy and planning a list of possible keywords and phrases to try.

Search engines for most searches, use Boolean searching, which is somewhat different from Internet searches. The Boolean search uses "operators," words (and, or, not, and near) that enable you to expand or narrow your affords. Tips for research paper while preparing research paper are very helpful guideline of research paper.

Choice of key words is first tool of tips to write research paper. Research paper writing is an art.A few tips for deciding as strategically as possible about keyword search:

- One should start brainstorming lists of possible keywords before even begin searching. Think about the most important concepts related to research work. Ask, "What words would a source have to include to be truly valuable in research paper?" Then consider synonyms for the important words.
- It may take the discovery of only one relevant paper to let steer in the right keyword direction because in most databases, the keywords under which a research paper is abstracted are listed with the paper.
- One should avoid outdated words.

Keywords are the key that opens a door to research work sources. Keyword searching is an art in which researcher's skills are bound to improve with experience and time.

Numerical Methods: Numerical methods used should be clear and, where appropriate, supported by references.

Acknowledgements: Please make these as concise as possible.

References

References follow the Harvard scheme of referencing. References in the text should cite the authors' names followed by the time of their publication, unless there are three or more authors when simply the first author's name is quoted followed by et al. unpublished work has to only be cited where necessary, and only in the text. Copies of references in press in other journals have to be supplied with submitted typescripts. It is necessary that all citations and references be carefully checked before submission, as mistakes or omissions will cause delays.

References to information on the World Wide Web can be given, but only if the information is available without charge to readers on an official site. Wikipedia and Similar websites are not allowed where anyone can change the information. Authors will be asked to make available electronic copies of the cited information for inclusion on the Global Journals Inc. (US) homepage at the judgment of the Editorial Board.

The Editorial Board and Global Journals Inc. (US) recommend that, citation of online-published papers and other material should be done via a DOI (digital object identifier). If an author cites anything, which does not have a DOI, they run the risk of the cited material not being noticeable.

The Editorial Board and Global Journals Inc. (US) recommend the use of a tool such as Reference Manager for reference management and formatting.

Tables, Figures and Figure Legends

Tables: Tables should be few in number, cautiously designed, uncrowned, and include only essential data. Each must have an Arabic number, e.g. Table 4, a self-explanatory caption and be on a separate sheet. Vertical lines should not be used.

Figures: Figures are supposed to be submitted as separate files. Always take in a citation in the text for each figure using Arabic numbers, e.g. Fig. 4. Artwork must be submitted online in electronic form by e-mailing them.

Preparation of Electronic Figures for Publication

Even though low quality images are sufficient for review purposes, print publication requires high quality images to prevent the final product being blurred or fuzzy. Submit (or e-mail) EPS (line art) or TIFF (halftone/photographs) files only. MS PowerPoint and Word Graphics are unsuitable for printed pictures. Do not use pixel-oriented software. Scans (TIFF only) should have a resolution of at least 350 dpi (halftone) or 700 to 1100 dpi (line drawings) in relation to the imitation size. Please give the data for figures in black and white or submit a Color Work Agreement Form. EPS files must be saved with fonts embedded (and with a TIFF preview, if possible).

For scanned images, the scanning resolution (at final image size) ought to be as follows to ensure good reproduction: line art: >650 dpi; halftones (including gel photographs) : >350 dpi; figures containing both halftone and line images: >650 dpi.

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Figure Legends: Self-explanatory legends of all figures should be incorporated separately under the heading 'Legends to Figures'. In the full-text online edition of the journal, figure legends may possibly be truncated in abbreviated links to the full screen version. Therefore, the first 100 characters of any legend should notify the reader, about the key aspects of the figure.

6. AFTER ACCEPTANCE

Upon approval of a paper for publication, the manuscript will be forwarded to the dean, who is responsible for the publication of the Global Journals Inc. (US).

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The corresponding author will receive an e-mail alert containing a link to a website or will be attached. A working e-mail address must therefore be provided for the related author.

Acrobat Reader will be required in order to read this file. This software can be downloaded

(Free of charge) from the following website:

www.adobe.com/products/acrobat/readstep2.html. This will facilitate the file to be opened, read on screen, and printed out in order for any corrections to be added. Further instructions will be sent with the proof.

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Before start writing a good quality Computer Science Research Paper, let us first understand what is Computer Science Research Paper? So, Computer Science Research Paper is the paper which is written by professionals or scientists who are associated to Computer Science and Information Technology, or doing research study in these areas. If you are novel to this field then you can consult about this field from your supervisor or guide.

TECHNIQUES FOR WRITING A GOOD QUALITY RESEARCH PAPER:

1. Choosing the topic: In most cases, the topic is searched by the interest of author but it can be also suggested by the guides. You can have several topics and then you can judge that in which topic or subject you are finding yourself most comfortable. This can be done by asking several questions to yourself, like Will I be able to carry our search in this area? Will I find all necessary recourses to accomplish the search? Will I be able to find all information in this field area? If the answer of these types of questions will be "Yes" then you can choose that topic. In most of the cases, you may have to conduct the surveys and have to visit several places because this field is related to Computer Science and Information Technology. Also, you may have to do a lot of work to find all rise and falls regarding the various data of that subject. Sometimes, detailed information plays a vital role, instead of short information.

2. Evaluators are human: First thing to remember that evaluators are also human being. They are not only meant for rejecting a paper. They are here to evaluate your paper. So, present your Best.

3. Think Like Evaluators: If you are in a confusion or getting demotivated that your paper will be accepted by evaluators or not, then think and try to evaluate your paper like an Evaluator. Try to understand that what an evaluator wants in your research paper and automatically you will have your answer.

4. Make blueprints of paper: The outline is the plan or framework that will help you to arrange your thoughts. It will make your paper logical. But remember that all points of your outline must be related to the topic you have chosen.

5. Ask your Guides: If you are having any difficulty in your research, then do not hesitate to share your difficulty to your guide (if you have any). They will surely help you out and resolve your doubts. If you can't clarify what exactly you require for your work then ask the supervisor to help you with the alternative. He might also provide you the list of essential readings.

6. Use of computer is recommended: As you are doing research in the field of Computer Science, then this point is quite obvious.

7. Use right software: Always use good quality software packages. If you are not capable to judge good software then you can lose quality of your paper unknowingly. There are various software programs available to help you, which you can get through Internet.

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9. Use and get big pictures: Always use encyclopedias, Wikipedia to get pictures so that you can go into the depth.

10. Bookmarks are useful: When you read any book or magazine, you generally use bookmarks, right! It is a good habit, which helps to not to lose your continuity. You should always use bookmarks while searching on Internet also, which will make your search easier.

11. Revise what you wrote: When you write anything, always read it, summarize it and then finalize it.

12. Make all efforts: Make all efforts to mention what you are going to write in your paper. That means always have a good start. Try to mention everything in introduction, that what is the need of a particular research paper. Polish your work by good skill of writing and always give an evaluator, what he wants.

13. Have backups: When you are going to do any important thing like making research paper, you should always have backup copies of it either in your computer or in paper. This will help you to not to lose any of your important.

14. Produce good diagrams of your own: Always try to include good charts or diagrams in your paper to improve quality. Using several and unnecessary diagrams will degrade the quality of your paper by creating "hotchpotch." So always, try to make and include those diagrams, which are made by your own to improve readability and understandability of your paper.

15. Use of direct quotes: When you do research relevant to literature, history or current affairs then use of quotes become essential but if study is relevant to science then use of quotes is not preferable.

16. Use proper verb tense: Use proper verb tenses in your paper. Use past tense, to present those events that happened. Use present tense to indicate events that are going on. Use future tense to indicate future happening events. Use of improper and wrong tenses will confuse the evaluator. Avoid the sentences that are incomplete.

17. Never use online paper: If you are getting any paper on Internet, then never use it as your research paper because it might be possible that evaluator has already seen it or maybe it is outdated version.

18. Pick a good study spot: To do your research studies always try to pick a spot, which is quiet. Every spot is not for studies. Spot that suits you choose it and proceed further.

19. Know what you know: Always try to know, what you know by making objectives. Else, you will be confused and cannot achieve your target.

20. Use good quality grammar: Always use a good quality grammar and use words that will throw positive impact on evaluator. Use of good quality grammar does not mean to use tough words, that for each word the evaluator has to go through dictionary. Do not start sentence with a conjunction. Do not fragment sentences. Eliminate one-word sentences. Ignore passive voice. Do not ever use a big word when a diminutive one would suffice. Verbs have to be in agreement with their subjects. Prepositions are not expressions to finish sentences with. It is incorrect to ever divide an infinitive. Avoid clichés like the disease. Also, always shun irritating alliteration. Use language that is simple and straight forward. put together a neat summary.

21. Arrangement of information: Each section of the main body should start with an opening sentence and there should be a changeover at the end of the section. Give only valid and powerful arguments to your topic. You may also maintain your arguments with records.

22. Never start in last minute: Always start at right time and give enough time to research work. Leaving everything to the last minute will degrade your paper and spoil your work.

23. Multitasking in research is not good: Doing several things at the same time proves bad habit in case of research activity. Research is an area, where everything has a particular time slot. Divide your research work in parts and do particular part in particular time slot.

24. Never copy others' work: Never copy others' work and give it your name because if evaluator has seen it anywhere you will be in trouble.

25. Take proper rest and food: No matter how many hours you spend for your research activity, if you are not taking care of your health then all your efforts will be in vain. For a quality research, study is must, and this can be done by taking proper rest and food.

26. Go for seminars: Attend seminars if the topic is relevant to your research area. Utilize all your resources.



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27. Refresh your mind after intervals: Try to give rest to your mind by listening to soft music or by sleeping in intervals. This will also improve your memory.

28. Make colleagues: Always try to make colleagues. No matter how sharper or intelligent you are, if you make colleagues you can have several ideas, which will be helpful for your research.

29. Think technically: Always think technically. If anything happens, then search its reasons, its benefits, and demerits.

30. Think and then print: When you will go to print your paper, notice that tables are not be split, headings are not detached from their descriptions, and page sequence is maintained.

31. Adding unnecessary information: Do not add unnecessary information, like, I have used MS Excel to draw graph. Do not add irrelevant and inappropriate material. These all will create superfluous. Foreign terminology and phrases are not apropos. One should NEVER take a broad view. Analogy in script is like feathers on a snake. Not at all use a large word when a very small one would be sufficient. Use words properly, regardless of how others use them. Remove quotations. Puns are for kids, not grunt readers. Amplification is a billion times of inferior quality than sarcasm.

32. Never oversimplify everything: To add material in your research paper, never go for oversimplification. This will definitely irritate the evaluator. Be more or less specific. Also too, by no means, ever use rhythmic redundancies. Contractions aren't essential and shouldn't be there used. Comparisons are as terrible as clichés. Give up ampersands and abbreviations, and so on. Remove commas, that are, not necessary. Parenthetical words however should be together with this in commas. Understatement is all the time the complete best way to put onward earth-shaking thoughts. Give a detailed literary review.

33. Report concluded results: Use concluded results. From raw data, filter the results and then conclude your studies based on measurements and observations taken. Significant figures and appropriate number of decimal places should be used. Parenthetical remarks are prohibitive. Proofread carefully at final stage. In the end give outline to your arguments. Spot out perspectives of further study of this subject. Justify your conclusion by at the bottom of them with sufficient justifications and examples.

34. After conclusion: Once you have concluded your research, the next most important step is to present your findings. Presentation is extremely important as it is the definite medium though which your research is going to be in print to the rest of the crowd. Care should be taken to categorize your thoughts well and present them in a logical and neat manner. A good quality research paper format is essential because it serves to highlight your research paper and bring to light all necessary aspects in your research.

Informal Guidelines of Research Paper Writing

Key points to remember:

- Submit all work in its final form.
- Write your paper in the form, which is presented in the guidelines using the template.
- Please note the criterion for grading the final paper by peer-reviewers.

Final Points:

A purpose of organizing a research paper is to let people to interpret your effort selectively. The journal requires the following sections, submitted in the order listed, each section to start on a new page.

The introduction will be compiled from reference matter and will reflect the design processes or outline of basis that direct you to make study. As you will carry out the process of study, the method and process section will be constructed as like that. The result segment will show related statistics in nearly sequential order and will direct the reviewers next to the similar intellectual paths throughout the data that you took to carry out your study. The discussion section will provide understanding of the data and projections as to the implication of the results. The use of good quality references all through the paper will give the effort trustworthiness by representing an alertness of prior workings.

Writing a research paper is not an easy job no matter how trouble-free the actual research or concept. Practice, excellent preparation, and controlled record keeping are the only means to make straightforward the progression.

General style:

Specific editorial column necessities for compliance of a manuscript will always take over from directions in these general guidelines.

To make a paper clear

· Adhere to recommended page limits

Mistakes to evade

- Insertion a title at the foot of a page with the subsequent text on the next page
- Separating a table/chart or figure - impound each figure/table to a single page
- Submitting a manuscript with pages out of sequence

In every sections of your document

· Use standard writing style including articles ("a", "the," etc.)

· Keep on paying attention on the research topic of the paper

· Use paragraphs to split each significant point (excluding for the abstract)

· Align the primary line of each section

· Present your points in sound order

· Use present tense to report well accepted

· Use past tense to describe specific results

· Shun familiar wording, don't address the reviewer directly, and don't use slang, slang language, or superlatives

· Shun use of extra pictures - include only those figures essential to presenting results

Title Page:

Choose a revealing title. It should be short. It should not have non-standard acronyms or abbreviations. It should not exceed two printed lines. It should include the name(s) and address (es) of all authors.



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Abstract:

The summary should be two hundred words or less. It should briefly and clearly explain the key findings reported in the manuscript--must have precise statistics. It should not have abnormal acronyms or abbreviations. It should be logical in itself. Shun citing references at this point.

An abstract is a brief distinct paragraph summary of finished work or work in development. In a minute or less a reviewer can be taught the foundation behind the study, common approach to the problem, relevant results, and significant conclusions or new questions.

Write your summary when your paper is completed because how can you write the summary of anything which is not yet written? Wealth of terminology is very essential in abstract. Yet, use comprehensive sentences and do not let go readability for briefness. You can maintain it succinct by phrasing sentences so that they provide more than lone rationale. The author can at this moment go straight to shortening the outcome. Sum up the study, with the subsequent elements in any summary. Try to maintain the initial two items to no more than one ruling each.

- Reason of the study - theory, overall issue, purpose
- Fundamental goal
- To the point depiction of the research
- Consequences, including definite statistics - if the consequences are quantitative in nature, account quantitative data; results of any numerical analysis should be reported
- Significant conclusions or questions that track from the research(es)

Approach:

- Single section, and succinct
- As a outline of job done, it is always written in past tense
- A conceptual should situate on its own, and not submit to any other part of the paper such as a form or table
- Center on shortening results - bound background information to a verdict or two, if completely necessary
- What you account in an conceptual must be regular with what you reported in the manuscript
- Exact spelling, clearness of sentences and phrases, and appropriate reporting of quantities (proper units, important statistics) are just as significant in an abstract as they are anywhere else

Introduction:

The **Introduction** should "introduce" the manuscript. The reviewer should be presented with sufficient background information to be capable to comprehend and calculate the purpose of your study without having to submit to other works. The basis for the study should be offered. Give most important references but shun difficult to make a comprehensive appraisal of the topic. In the introduction, describe the problem visibly. If the problem is not acknowledged in a logical, reasonable way, the reviewer will have no attention in your result. Speak in common terms about techniques used to explain the problem, if needed, but do not present any particulars about the protocols here. Following approach can create a valuable beginning:

- Explain the value (significance) of the study
- Shield the model - why did you employ this particular system or method? What is its compensation? You strength remark on its appropriateness from a abstract point of vision as well as point out sensible reasons for using it.
- Present a justification. Status your particular theory (es) or aim(s), and describe the logic that led you to choose them.
- Very for a short time explain the tentative propose and how it skilled the declared objectives.

Approach:

- Use past tense except for when referring to recognized facts. After all, the manuscript will be submitted after the entire job is done.
- Sort out your thoughts; manufacture one key point with every section. If you make the four points listed above, you will need a least of four paragraphs.

- Present surroundings information only as desirable in order hold up a situation. The reviewer does not desire to read the whole thing you know about a topic.
- Shape the theory/purpose specifically - do not take a broad view.
- As always, give awareness to spelling, simplicity and correctness of sentences and phrases.

Procedures (Methods and Materials):

This part is supposed to be the easiest to carve if you have good skills. A sound written Procedures segment allows a capable scientist to replacement your results. Present precise information about your supplies. The suppliers and clarity of reagents can be helpful bits of information. Present methods in sequential order but linked methodologies can be grouped as a segment. Be concise when relating the protocols. Attempt for the least amount of information that would permit another capable scientist to spare your outcome but be cautious that vital information is integrated. The use of subheadings is suggested and ought to be synchronized with the results section. When a technique is used that has been well described in another object, mention the specific item describing a way but draw the basic principle while stating the situation. The purpose is to text all particular resources and broad procedures, so that another person may use some or all of the methods in one more study or referee the scientific value of your work. It is not to be a step by step report of the whole thing you did, nor is a methods section a set of orders.

Materials:

- Explain materials individually only if the study is so complex that it saves liberty this way.
- Embrace particular materials, and any tools or provisions that are not frequently found in laboratories.
- Do not take in frequently found.
- If use of a definite type of tools.
- Materials may be reported in a part section or else they may be recognized along with your measures.

Methods:

- Report the method (not particulars of each process that engaged the same methodology)
- Describe the method entirely
- To be succinct, present methods under headings dedicated to specific dealings or groups of measures
- Simplify - details how procedures were completed not how they were exclusively performed on a particular day.
- If well known procedures were used, account the procedure by name, possibly with reference, and that's all.

Approach:

- It is embarrassed or not possible to use vigorous voice when documenting methods with no using first person, which would focus the reviewer's interest on the researcher rather than the job. As a result when script up the methods most authors use third person passive voice.
- Use standard style in this and in every other part of the paper - avoid familiar lists, and use full sentences.

What to keep away from

- Resources and methods are not a set of information.
- Skip all descriptive information and surroundings - save it for the argument.
- Leave out information that is immaterial to a third party.

Results:

The principle of a results segment is to present and demonstrate your conclusion. Create this part a entirely objective details of the outcome, and save all understanding for the discussion.

The page length of this segment is set by the sum and types of data to be reported. Carry on to be to the point, by means of statistics and tables, if suitable, to present consequences most efficiently.You must obviously differentiate material that would usually be incorporated in a study editorial from any unprocessed data or additional appendix matter that would not be available. In fact, such matter should not be submitted at all except requested by the instructor.



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Content

- Sum up your conclusion in text and demonstrate them, if suitable, with figures and tables.
- In manuscript, explain each of your consequences, point the reader to remarks that are most appropriate.
- Present a background, such as by describing the question that was addressed by creation an exacting study.
- Explain results of control experiments and comprise remarks that are not accessible in a prescribed figure or table, if appropriate.
- Examine your data, then prepare the analyzed (transformed) data in the form of a figure (graph), table, or in manuscript form.

What to stay away from

- Do not discuss or infer your outcome, report surroundings information, or try to explain anything.
- Not at all, take in raw data or intermediate calculations in a research manuscript.
- Do not present the similar data more than once.
- Manuscript should complement any figures or tables, not duplicate the identical information.
- Never confuse figures with tables - there is a difference.

Approach

- As forever, use past tense when you submit to your results, and put the whole thing in a reasonable order.
- Put figures and tables, appropriately numbered, in order at the end of the report
- If you desire, you may place your figures and tables properly within the text of your results part.

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- If you put figures and tables at the end of the details, make certain that they are visibly distinguished from any attach appendix materials, such as raw facts
- Despite of position, each figure must be numbered one after the other and complete with subtitle
- In spite of position, each table must be titled, numbered one after the other and complete with heading
- All figure and table must be adequately complete that it could situate on its own, divide from text

Discussion:

The Discussion is expected the trickiest segment to write and describe. A lot of papers submitted for journal are discarded based on problems with the Discussion. There is no head of state for how long a argument should be. Position your understanding of the outcome visibly to lead the reviewer through your conclusions, and then finish the paper with a summing up of the implication of the study. The purpose here is to offer an understanding of your results and hold up for all of your conclusions, using facts from your research and generally accepted information, if suitable. The implication of result should be visibly described. Infer your data in the conversation in suitable depth. This means that when you clarify an observable fact you must explain mechanisms that may account for the observation. If your results vary from your prospect, make clear why that may have happened. If your results agree, then explain the theory that the proof supported. It is never suitable to just state that the data approved with prospect, and let it drop at that.

- Make a decision if each premise is supported, discarded, or if you cannot make a conclusion with assurance. Do not just dismiss a study or part of a study as "uncertain."
- Research papers are not acknowledged if the work is imperfect. Draw what conclusions you can based upon the results that you have, and take care of the study as a finished work
- You may propose future guidelines, such as how the experiment might be personalized to accomplish a new idea.
- Give details all of your remarks as much as possible, focus on mechanisms.
- Make a decision if the tentative design sufficiently addressed the theory, and whether or not it was correctly restricted.
- Try to present substitute explanations if sensible alternatives be present.
- One research will not counter an overall question, so maintain the large picture in mind, where do you go next? The best studies unlock new avenues of study. What questions remain?
- Recommendations for detailed papers will offer supplementary suggestions.

Approach:

- When you refer to information, differentiate data generated by your own studies from available information
- Submit to work done by specific persons (including you) in past tense.
- Submit to generally acknowledged facts and main beliefs in present tense.

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- Methods to avoid Plagiarism is applied by us on every paper, if found guilty, you will be blacklisted by all of our collaborated research groups, your institution will be informed for this and strict legal actions will be taken immediately.)
- To guard yourself and others from possible illegal use please do not permit anyone right to use to your paper and files.



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Criterion for Grading a Research Paper (Compilation) by Global Journals Inc. (US)

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Topics	Grades		
	A-B	**C-D**	**E-F**
Abstract	Clear and concise with appropriate content, Correct format. 200 words or below	Unclear summary and no specific data, Incorrect form Above 200 words	No specific data with ambiguous information Above 250 words
Introduction	Containing all background details with clear goal and appropriate details, flow specification, no grammar and spelling mistake, well organized sentence and paragraph, reference cited	Unclear and confusing data, appropriate format, grammar and spelling errors with unorganized matter	Out of place depth and content, hazy format
Methods and Procedures	Clear and to the point with well arranged paragraph, precision and accuracy of facts and figures, well organized subheads	Difficult to comprehend with embarrassed text, too much explanation but completed	Incorrect and unorganized structure with hazy meaning
Result	Well organized, Clear and specific, Correct units with precision, correct data, well structuring of paragraph, no grammar and spelling mistake	Complete and embarrassed text, difficult to comprehend	Irregular format with wrong facts and figures
Discussion	Well organized, meaningful specification, sound conclusion, logical and concise explanation, highly structured paragraph reference cited	Wordy, unclear conclusion, spurious	Conclusion is not cited, unorganized, difficult to comprehend
References	Complete and correct format, well organized	Beside the point, Incomplete	Wrong format and structuring

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Global Journal of Management and Business Research

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ISSN 9755853

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