Investments, Exports, Taxes, Interests, International Trade and Economic growth

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ABSTRACT

Introspection is driven more by economic down turns than the prosperity. One of the major theories in the history is the theory of general equilibrium. The theory was propounded as a two-sector model by Keynes during the great depression. This model has been expanded many times to cover multiple sectors. It remains the simplest frame work for mapping the Economy even with the variants of the multipliers for investments, Exports, Government expenditures and Taxes. This paper attempts to connect this theory not just with the data but with the processes in the public administration system, while analysing the woes of an economy, it is necessary to understand the structural gaps and fix them so that it can thrive.

De-monetisation was an excellent tool to plug the flow of money unaccounted in the monetary system. GST was yet another step forward to fix the fiscal structure. Similarly, the awareness on the jobs created though the investments have assumed the importance in the recent past. However, the discontent and gap has been huge. Is there no fix for the good programmes? This programme maps the Theoretical background of the General equilibrium theory briefly, then analyses the survey of literature and analyses the RBI Data relating to the sectors in the four-sector model.

Key Words: Investments, Exports, Taxes, De-Monetization, India

1. Introduction

During the time of economic downturn, there is a lot of introspection and course corrections. Very similar to the households, when there is job loss or overwhelming debt, there is also attempts to borrow by over valuation. After that, there is a great introspection. How should we analyse the situation and recommend measures? Can we just analyse the data and provide inference? What is the methodology adopted and is it right? Are there some changes required? What are the best practices followed by the benchmark economies? With these objectives the collected literature is presented and subsequently the paper analyses the data from Reserve Bank of India.

2. Methodology

This paper uses the RBI data

1. Long term data on the key parameters relating to the Keynesian model

2. Shorter data on the key parameters of the Keynesian model and the sectoral IIP data.

The data is subject to the following analysis both for the long term (annual) and short term (monthly) data:

1. Trend analysis and slope and r square estimation using excel.

2. Power BI Graphs.

3. Weka forecasts using multilayer perception methodology

Results are analysed in this paper to examine the trends of proxies for the Keynesian 4 sector model. Multiple tools and techniques are used to do the cross validation of the findings.
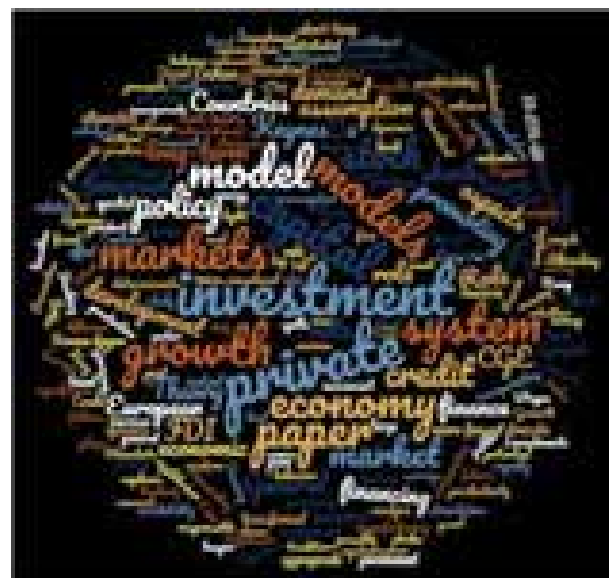

Figure 1: Word cloud analysis of the literature

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Figure 1 indicates that that the private investments and model are some of the key words from word cloud of the review of the literature. It is evident that the bottom line is the private in

The frequency of the word cloud indicates that the word investments has gained the lead over the economy. This exactly attributes the importance of the variables in the Keynesian four sector model. Hence the short-term analysis focuses more on the sectoral growth in the IIPs representing the "C" than the Long-term growth rates.

3. Visualisation Inferences

The visualisations in this section have been classified into two broad categories, they are the time and tools. On the time dimension the long term and short term are considered. On the tools the power BI, Excel and Weka results are presented.
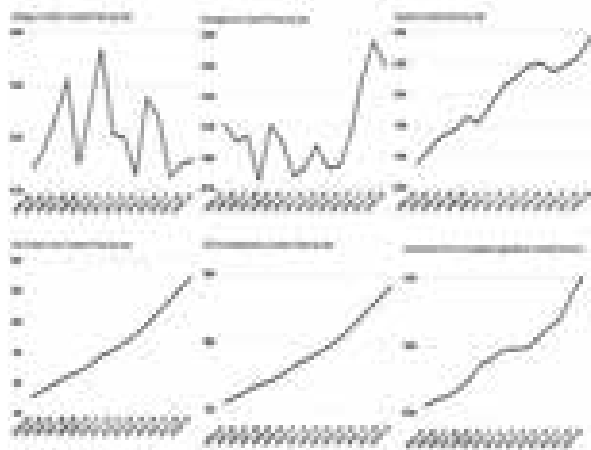
The above Power BI visualisations indicate the higher level of fluctuations in the stock prices and discrepancies over the years. Slight deviations are noted in the exports.
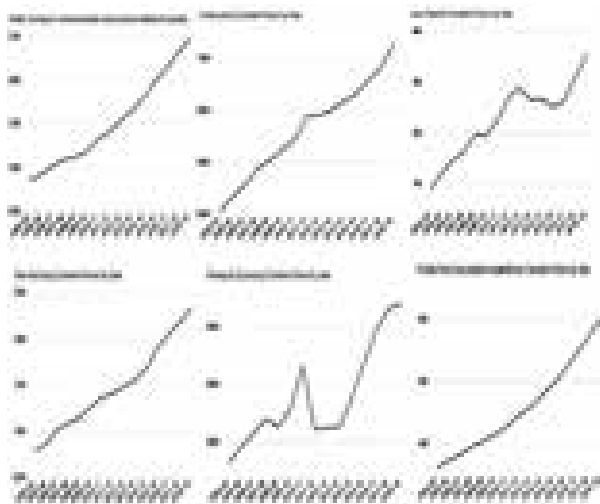
The Mining and the exports policies seems to have seen a drastic change over the years. There has been significant deviation amongst them. While the construction, hotels transport and communication service, manufacturing, and private final consumption have been progressing steadily.


- Key findings from the power BI visualisations for long-term data indicates that the highly fluctuating factors in long term were: Stock prices, Discrepancies, Mining and quarrying, Less exports constant prices

- The stable factors in the long term were: GVA base prices, GDP at market prices, Government final consumption expenditure, Hotel transport, Construction, Private final consumption, Agriculture forestry and fishing, Services, Electricity, gas water supply prices, Financial real estate and professional services. Public administration, defence and other services at constant prices.


Weka was able to support the forecast of services in terms of constant prices only using the multilayer perception. The multilayer perception projection visualisations are enabled only when the distribution is normal. The services growth shows a forthcoming plateau in the 10-year projections. In order to get a better insight into the long-term data the trend lines, their equations and the predictive fits were also

analysed and there are presented below:
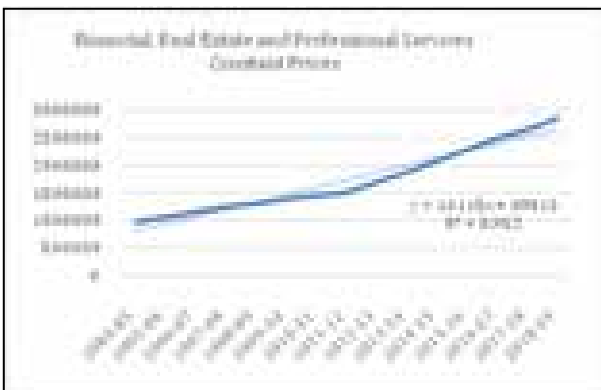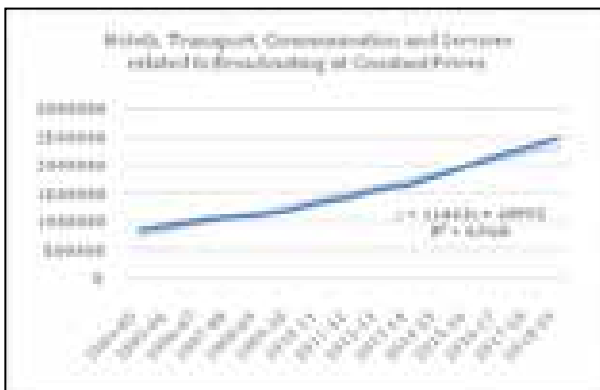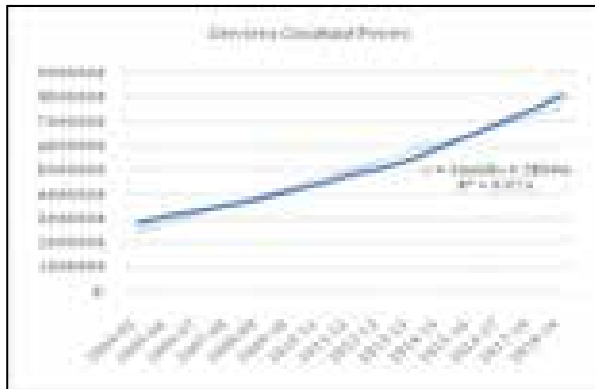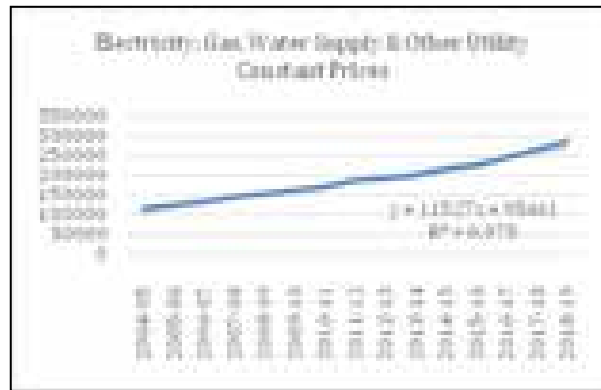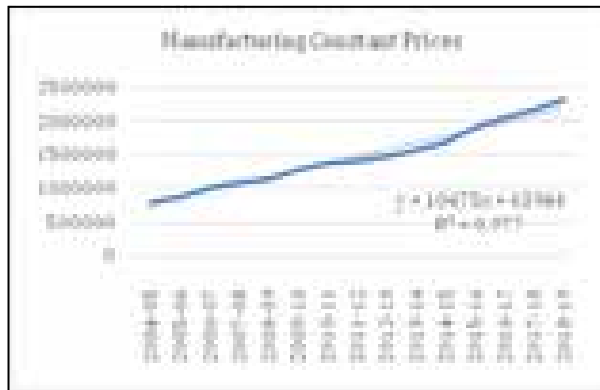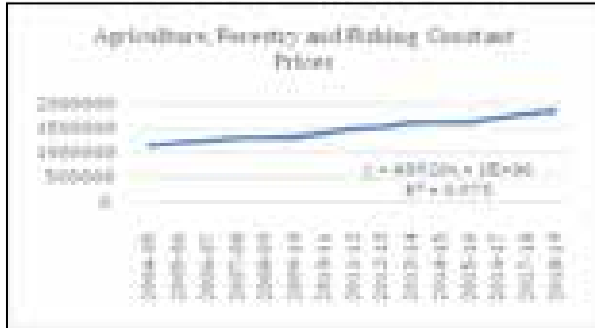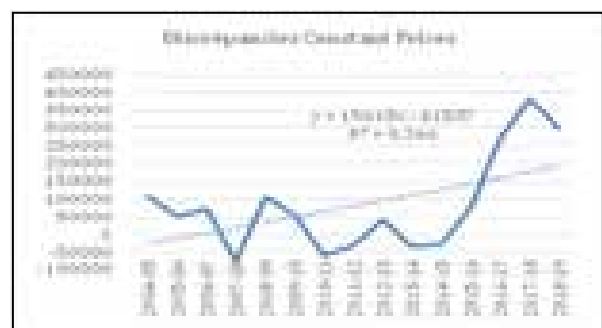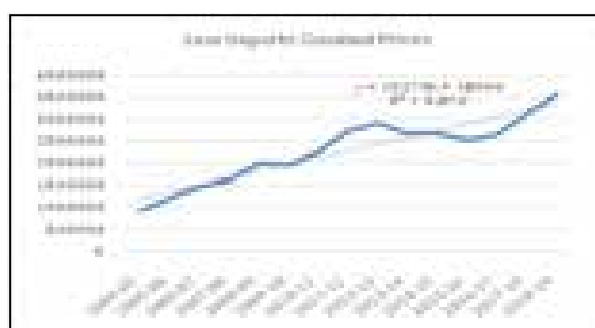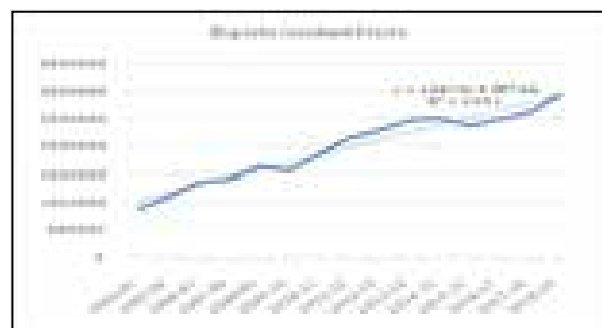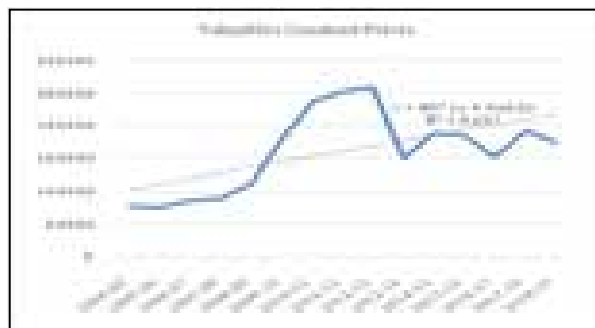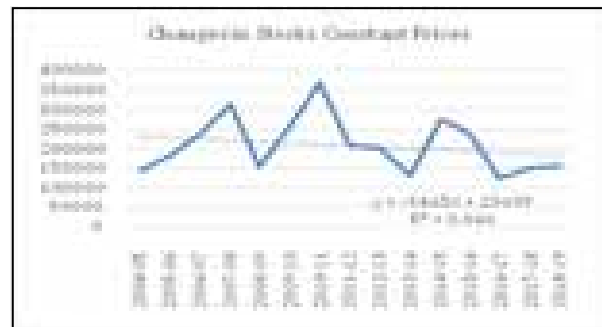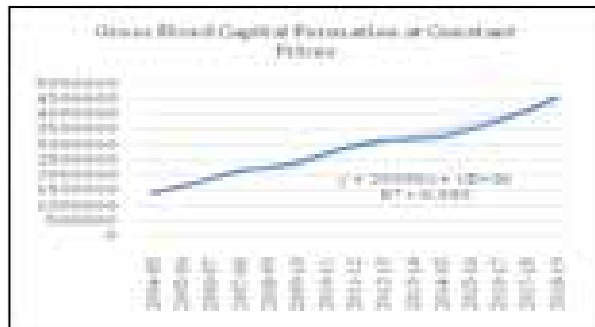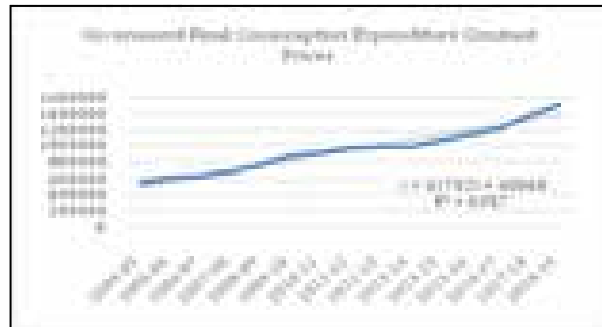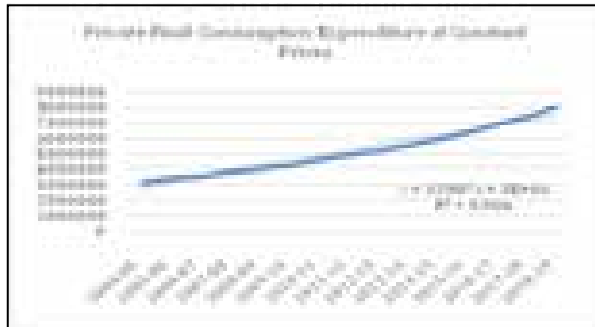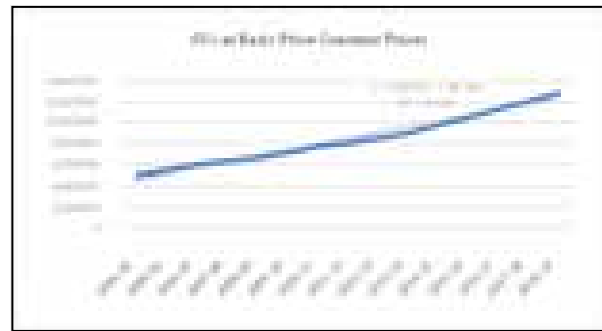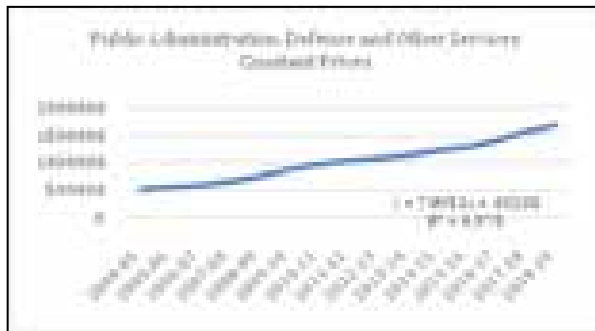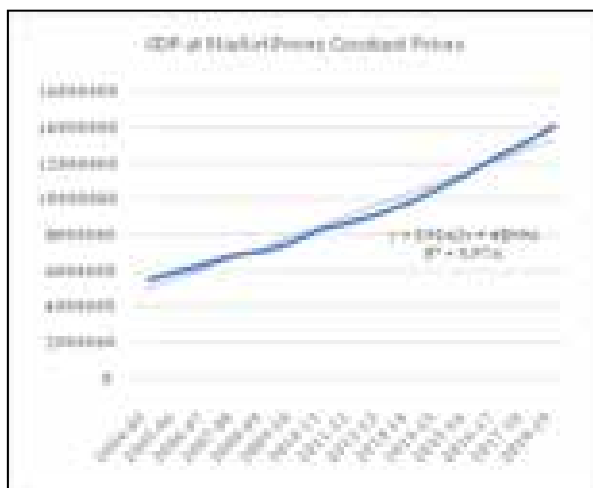
But for stock prices and Valuables rest were on a linear path over the last 15 years.

Table : Regression results of the long-term data

S. No.	Sector	Equation	R2
1	Agriculture, Forestry and Fishing Constant Prices	y = 48920x + 1E+06	0.9751
2	Mining & Quarrying Constant Prices	y = 8278.3x + 223298	0.7133
3	Manufacturing Constant Prices	y = 104752x + 639446	0.9771
4	Electricity, Gas, Water Supply & Other Utility Constant Prices	y = 11527x + 95661	0.9751
5	Services Constant Prices	y = 366655x + 2E+06	0.9764
6	Construction Constant Prices	y = 42109x + 390166	0.9873
7	Hotels, Transport, Communication and Services related to Broadcasting at Constant Prices	y = 114438x + 609938	0.9681
8	Financial, Real Estate and Professional Services Constant Prices	y = 131155x + 690136	0.9524
9	Public Administration, Defence and Other Services Constant Prices	y = 78953x + 392057	0.9758
10	GVA at Basic Price Constant Prices	y = 540133x + 4E+06	0.9787
11	Private Final Consumption Expenditure at Constant Prices	y = 328879x + 3E+06	0.9665
12	Government Final Consumption Expenditure Constant Prices	y = 61752x + 450489	0.9577
13	Gross Fixed Capital Formation at Constant Prices	y = 203855x + 1E+06	0.983
14	Valuables Constant Prices	y = 8071.6x + 96426	0.3377
15	Exports Constant Prices	y = 134703x + 897443	0.9515
16	Less Imports Constant Prices	y = 153782x + 1E+06	0.8767
17	Discrepancies Constant Prices	y = 15615x - 41537	0.2664
18	GDP at Market Prices Constant Prices	y = 595628x + 4E+06	0.9764

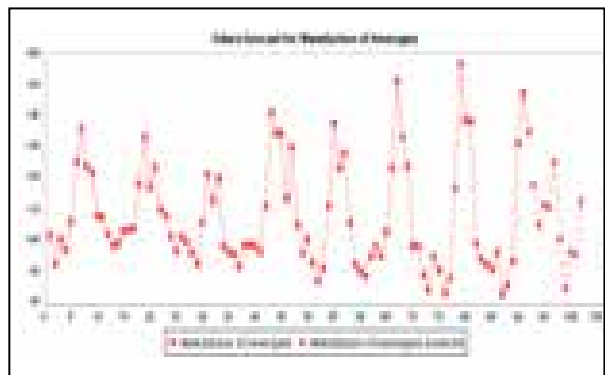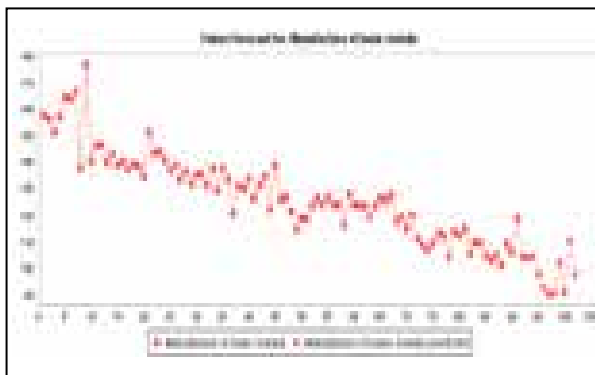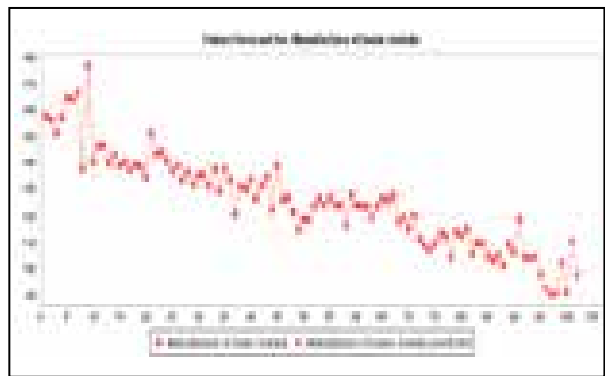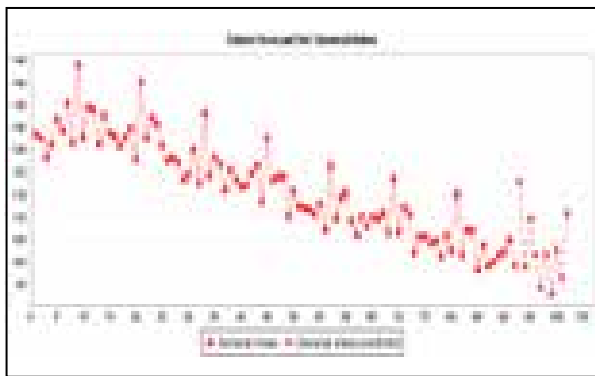The predictability of the valuables and discrepancies was very low during the last 15 years.

Monthly Data analysis: General Index by month
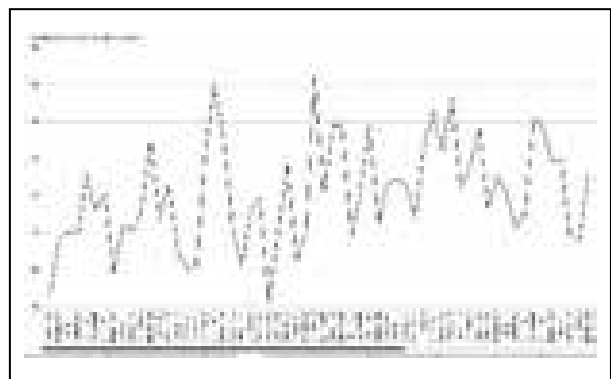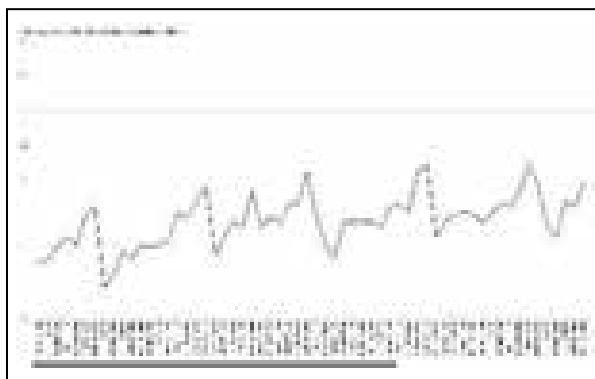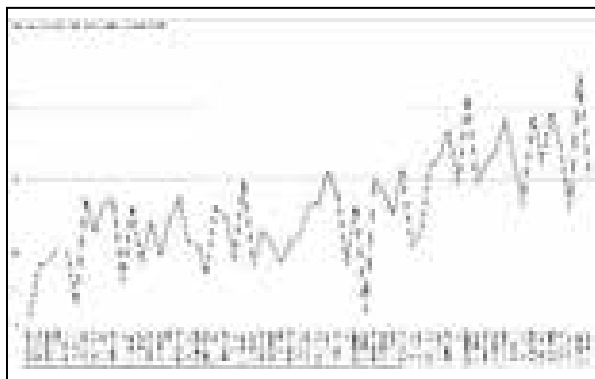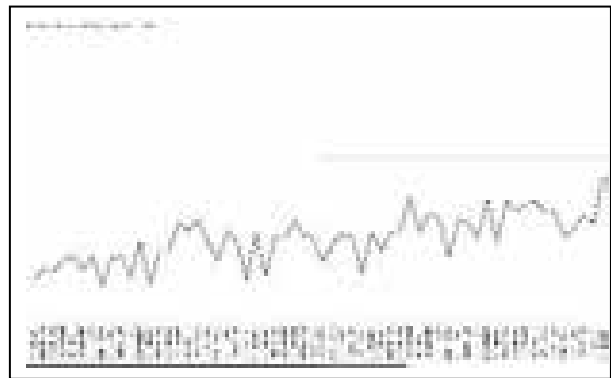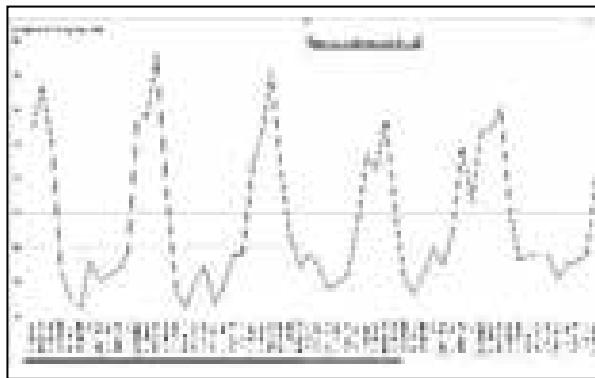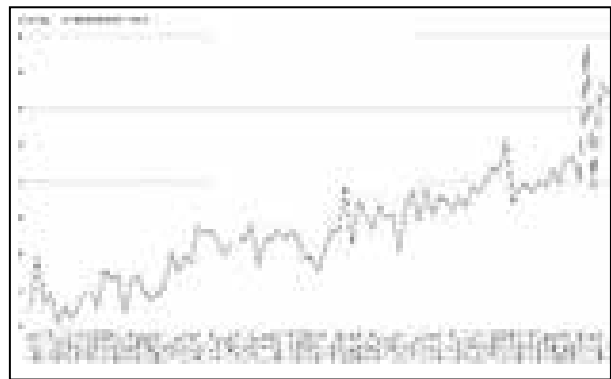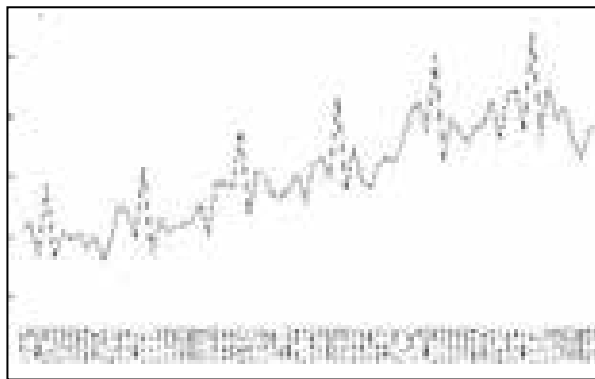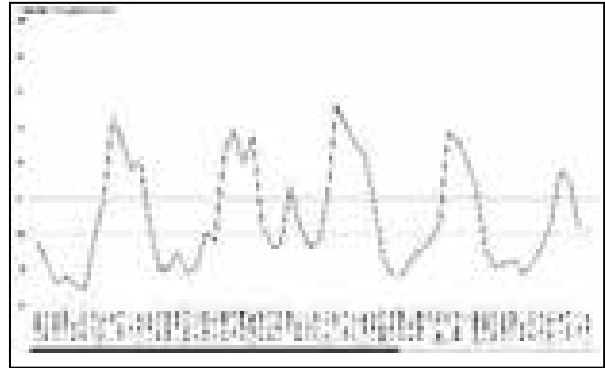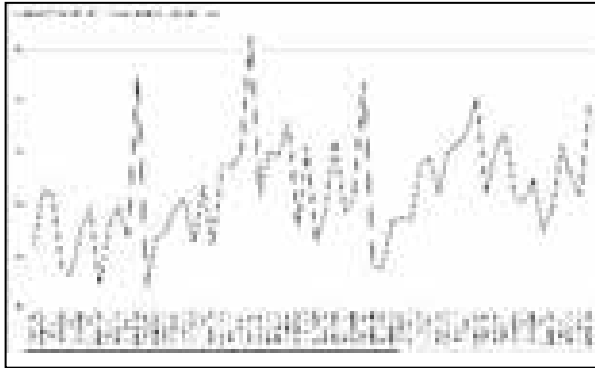
Though most of the graphs show an upward trend only three of them are predictable and the rest are risky investments.
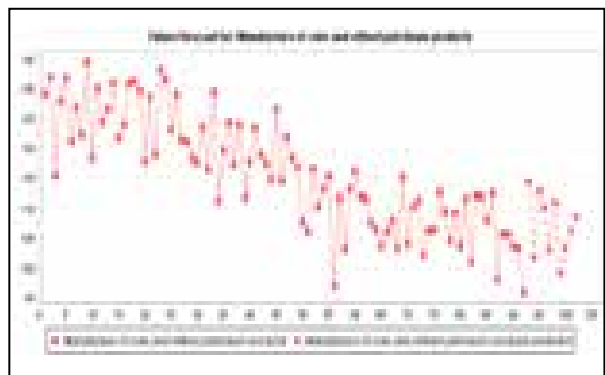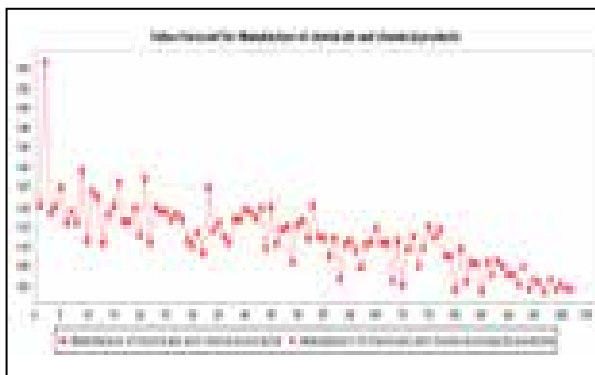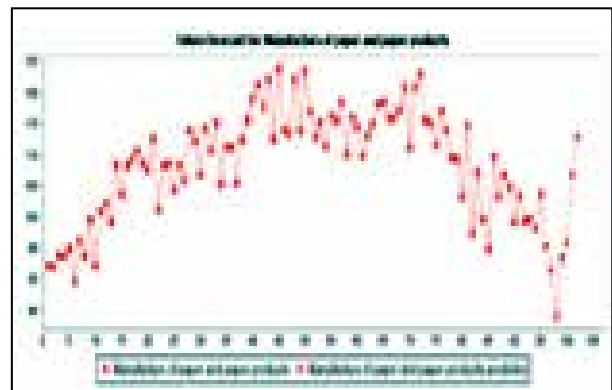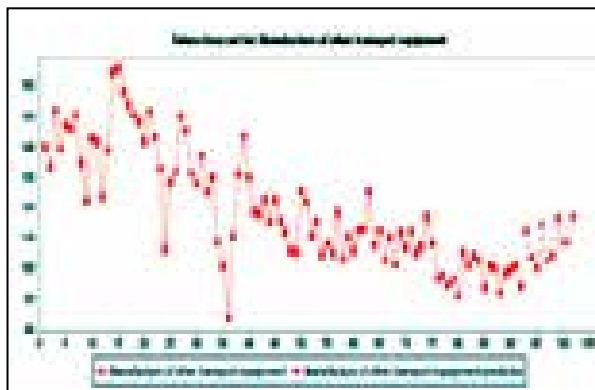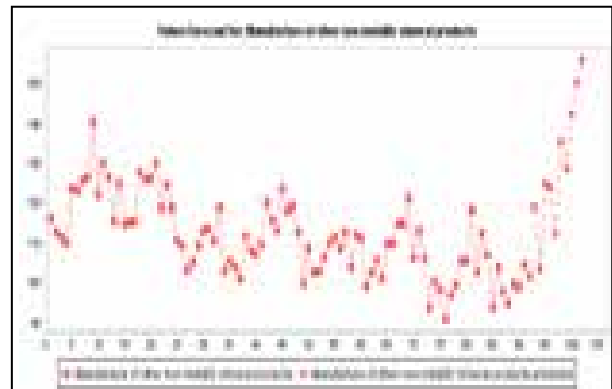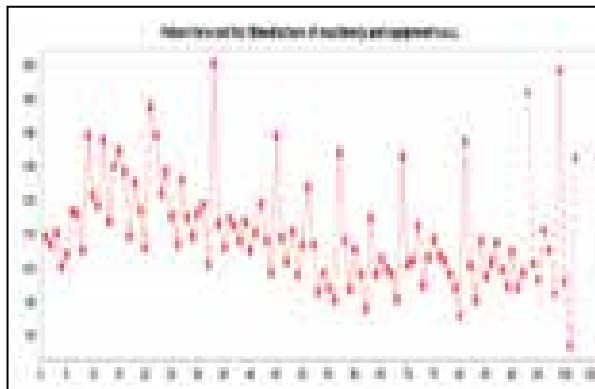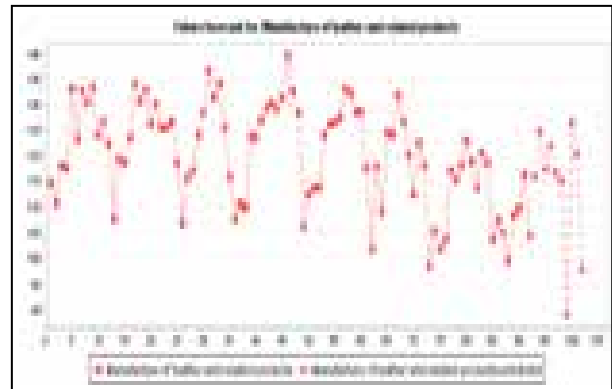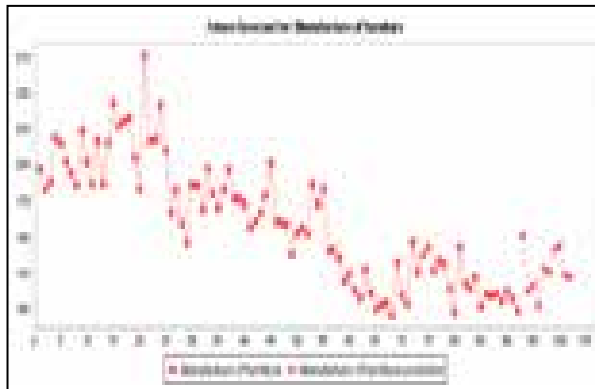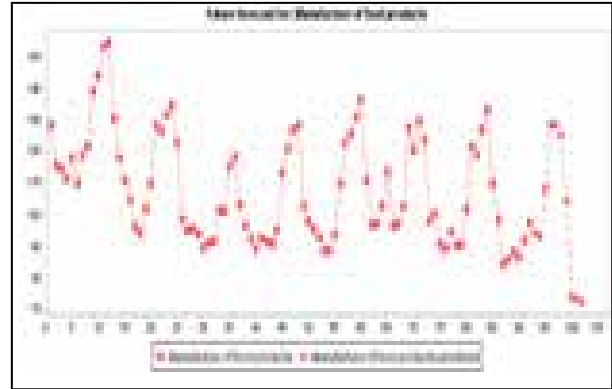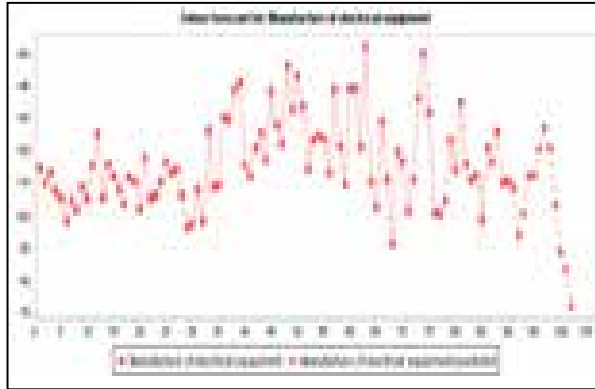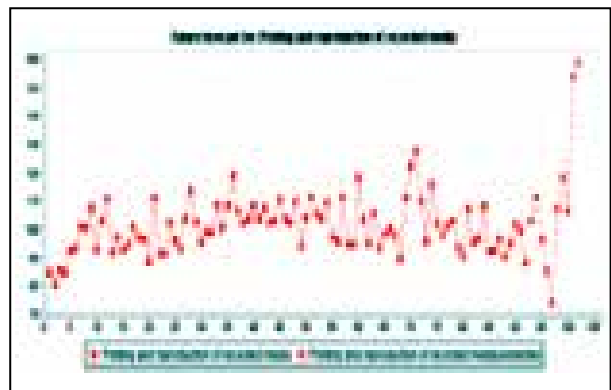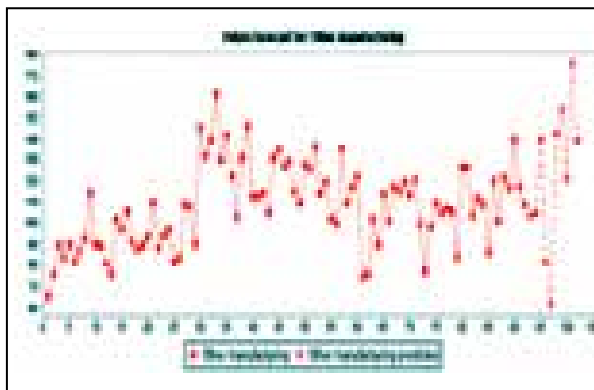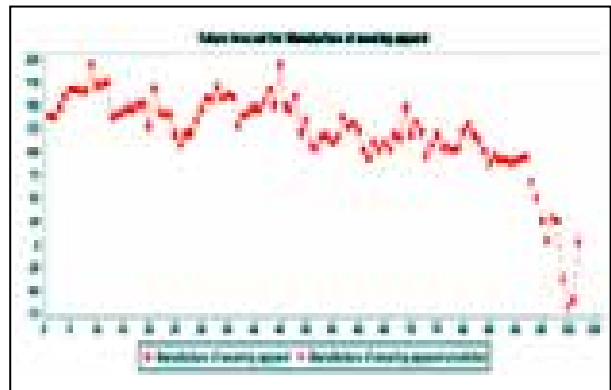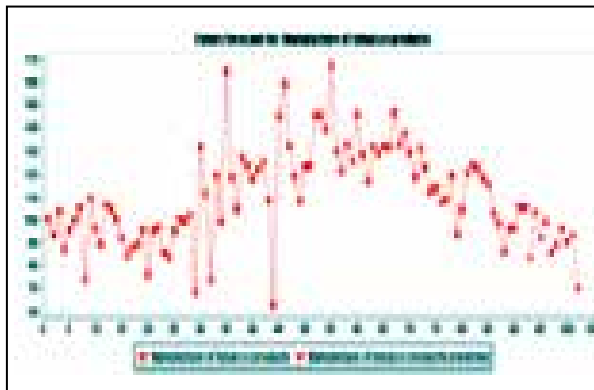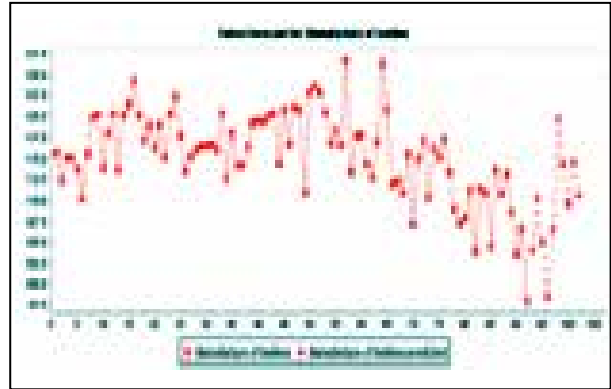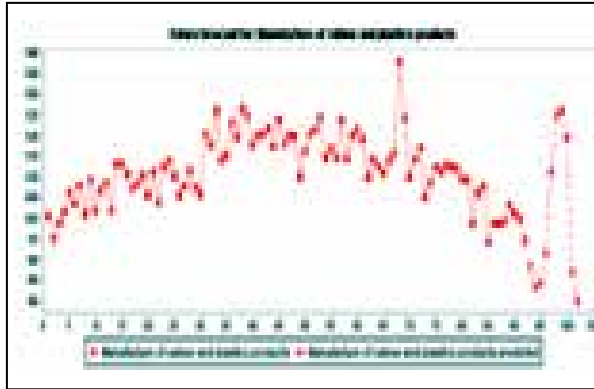
Analysis of the on short term parameters reveal that 18 out of 19 forecasts have been negative

- Manufacture of computer and electronics products failed to produce a forecast using multilayer forecasting using weka. This was since the time series did not follow a normal distribution.

- Fabricated metal products except machines also failed in generating a forecast using the multilayer forecast.

- Manufacture of motor vehicles, Trailers failed to generate a forecast using the multilayer forecast

- Manufacture of pharmaceutical, medicinal and Chemicals filed to generate a forecast.

Sectoral Analysis

In this section the RBI data relating to the sectors especially the C component of the Keynesian model was collected and analysed.
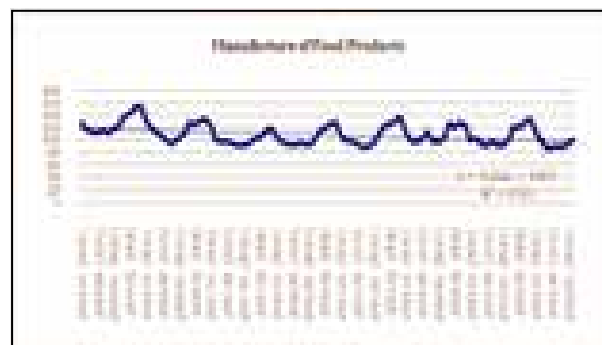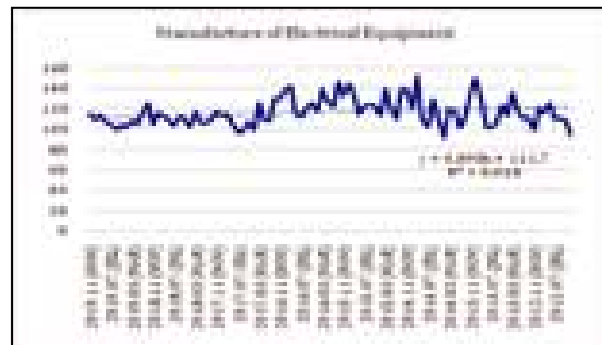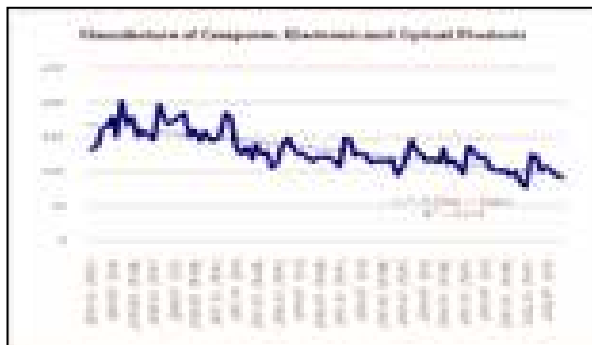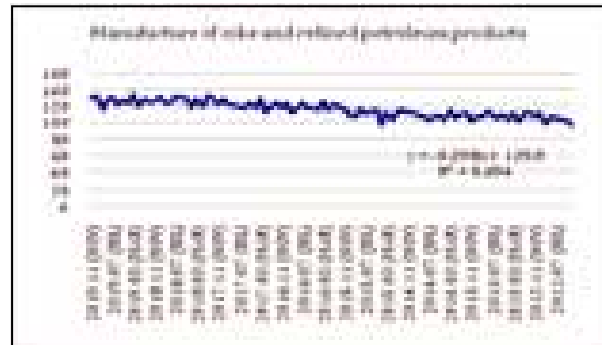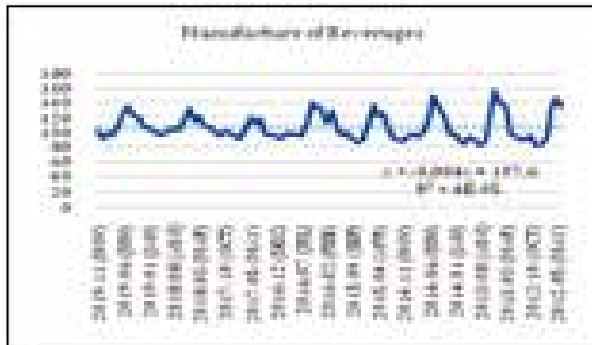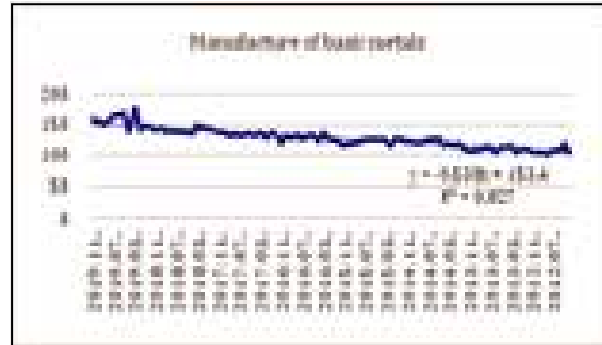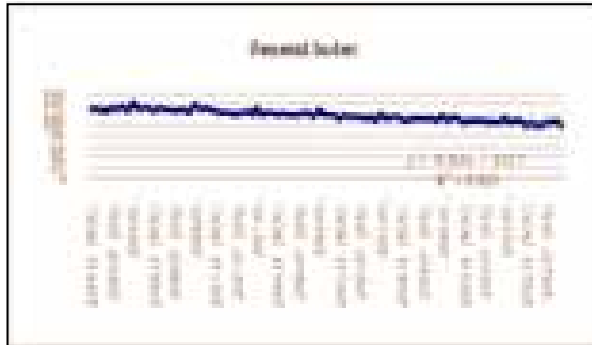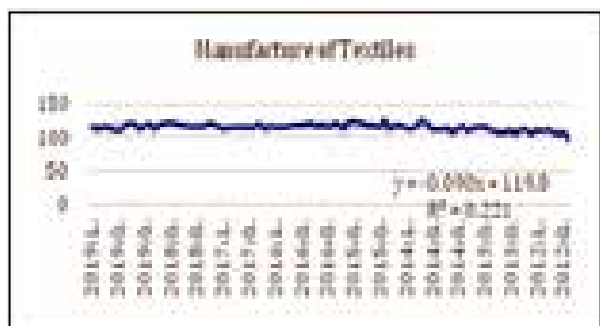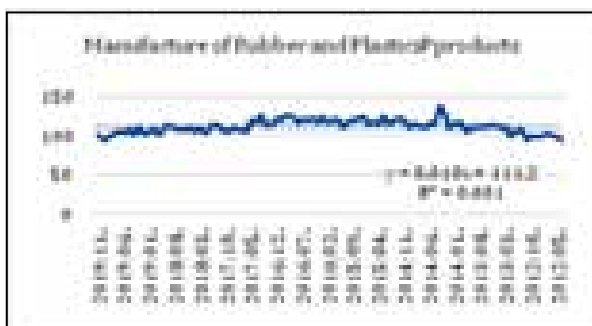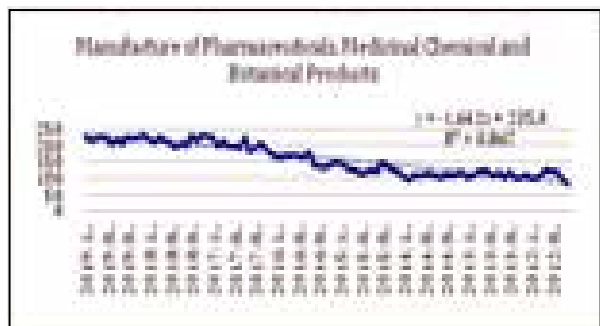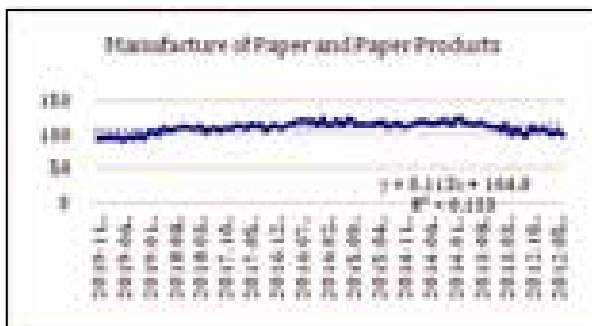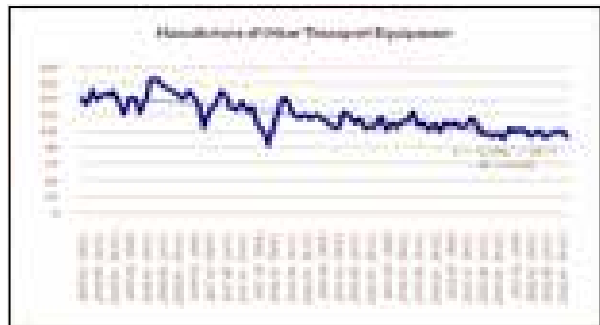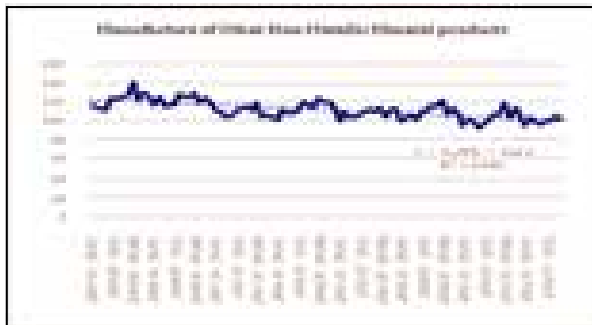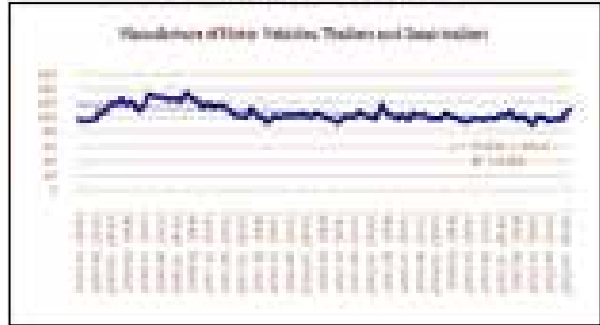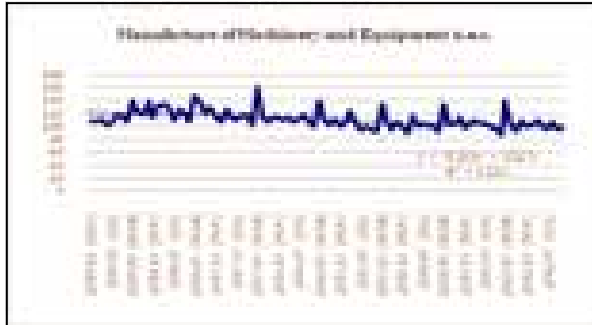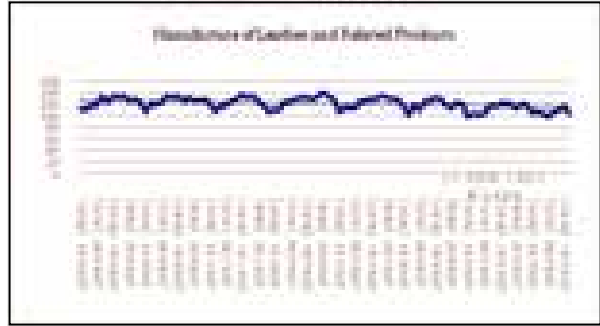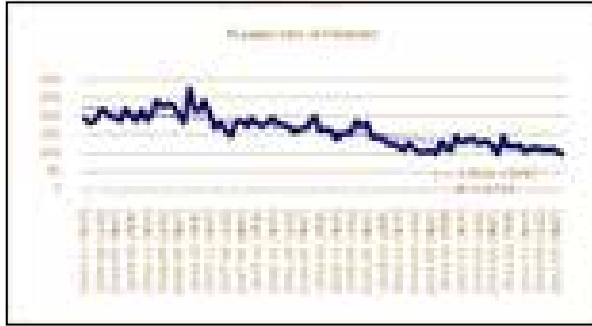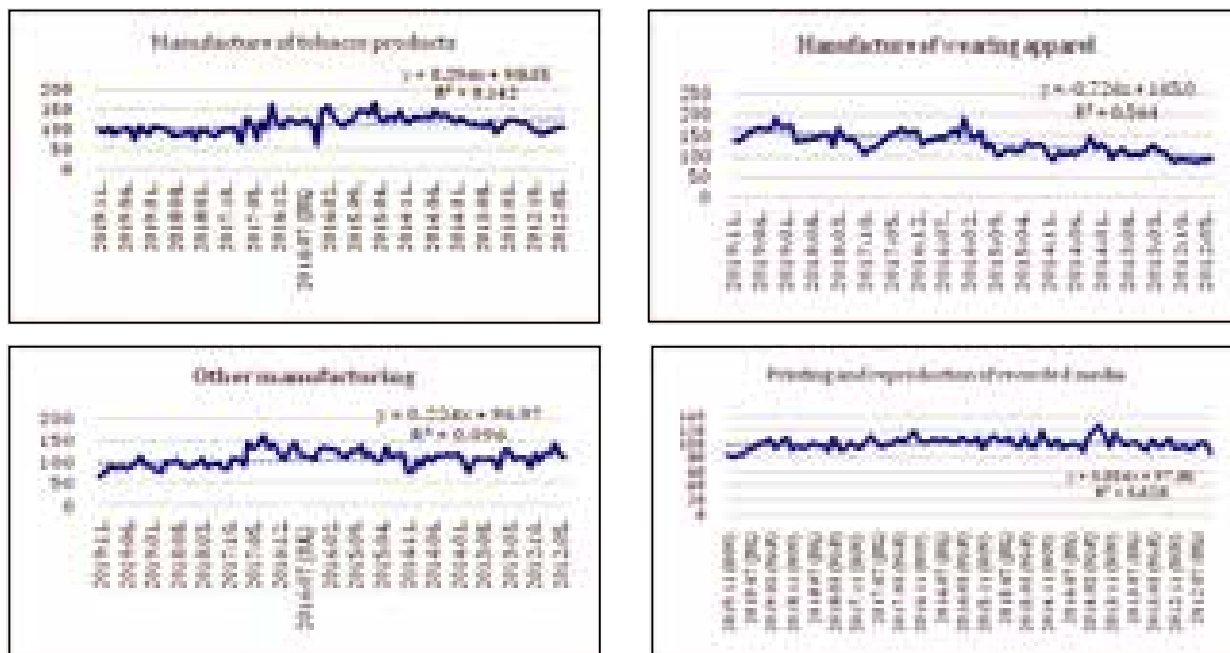
The analysis using the simple excel graphs reveal that 13 out of 22 sectors have a negative slope.

Table : Regression Results of the Short-term data

S.No.	Sector	Equation	R Squared
1	General Index	y = 0.2965x + 98.35	0.1422
2	Manufacture of Basic Metals	y = -0.7268x + 165.06	0.5645
3	Manufacture of Beverages	y = 0.2249x + 96.976	0.0965
4	Manufacture of coke and refined petroleum products	y = -0.2986x + 129.9	0.6942
5	Manufacture of computer, electronic and optical products	y = -0.7957x + 168.6	0.6315
6	Manufacture of electrical equipment	y = 0.0984x + 111.77	0.0384
7	Manufacture of fabricated metal products, except machinery and equipment	y = -0.0433x + 104.81	0.0125
8	Manufacture of food products	y = -0.2121x + 118.06	0.1151
9	Manufacture of furniture	y = -1.3608x + 224.37	0.7418
10	Manufacture of leather and related products	y = -0.1539x + 127.56	0.1763
11	Manufacture of machinery and equipment n.e.c.	y = -0.2612x + 122.35	0.2352
12	Manufacture of motor vehicles, trailers and semi-trailers	y = -0.2119x + 115.67	0.3024
13	Manufacture of other non-metallic mineral products	y = -0.2405x + 122.2	0.4469
14	Manufacture of other transport equipment	y = -0.5946x + 147.31	0.6789
15	Manufacture of paper and paper products	y = 0.1138x + 104.04	0.1335
16	Manufacture of pharmaceuticals, medicinal chemical and botanical products	y = -1.6428x + 235.04	0.8672
17	Manufacture of rubber and plastics products	y = 0.0102x + 111.23	0.0011

18	Manufacture of textiles	y = -0.0906x + 119.83	0.2219
19	Manufacture of tobacco products	y = 0.2965x + 98.35	0.1422
20	Manufacture of wearing apparel	y = -0.7268x + 165.06	0.5645
21	Other manufacturing	y = 0.2249x + 96.976	0.0965
22	Printing and reproduction of recorded media	y = 0.0549x + 97.854	0.0289

15 sectors had less than 0.5 r square indicating the lower predictability of the respective sectors.

1. Process on Economic inputs

Each state and the central departments have their consultative groups. They consult with the administrative groups to understand the budgetary demand. These demands are aggregated and passed on to the finance department. The approved demands would find an allocation code through which treasury withdrawals can be made.

As for as the industry demands are concerned, both before the central budget and the state budgets the consultations happen either through the ministers or the administration officials with the associations, export promotion councils and Sectoral councils. The inputs are incorporated into the demands and the theoretical validations are made at the highest levels with the academicians or their think tank at state and national levels.

2. Sum-up

- Key findings from the power BI visualisations for long-term data indicates that the highly fluctuating factors in long termwere: Stock prices, Discrepancies, Mining and quarrying, Less exports constant prices

- The stable factors in the long termwere: GVA base prices, GDP at market prices, Government final consumption expenditure, Hotel transport, Construction, Private final consumption, Agriculture forestry and fishing, Services, Electricity, gas water supply prices, Financial real estate and professional services.Public administration, defence and other services at constant prices.

- Weka was able to support the forecast of services in terms of constant prices only using the multilayer perception. The multilayer perception projection visualisations are enabled only when the distribution is normal. The services growth shows a forthcoming plateau in the 10-year projections.

- But for stock prices and Valuables rest were on a linear path over the last 15 years.

- 18 out of 19 forecasts have been negative

- Manufacture of computer and electronics products failed to produce a forecast using multilayer forecasting using Weka. This was since the time series did not follow a normal distribution.

- Fabricated metal products except machines also failed in generating a forecast using the multilayer forecast.

- Manufacture of motor vehicles, Trailers failed to generate a forecast using the multilayer forecast

- Manufacture of pharmaceutical, medicinal and Chemicals failed to generate a forecast.

- 13 out of 22 sectors have a negative slope.

- 15 sectors had less than .5 r squared indicating the lower predictability of the respective sectors.

3. Policy Recommendations

The visualisations where the predictions are not accurate those sectors require attention. Similarly, when the slope is negative those sectors need special attention. Consultations with the industry should be hierarchal from Village, Taluk, District, State and the Nation. Similar consultations are required with the academics to validate the theoretical soundness of the industry demands. The pre-budget representations are the macro level were well compared by FICCI. The key highlights seem to be request in agriculture were for expansion of the Micro irrigation by 6 times; Expansion of the PM Kissan and reduce subsidies, formation of the inter-ministerial group by the food industries and a National warehousing grid. In the case of infrastructure, they have recommended for major projects in Road, Highways, Sub-urban metros and airports to boost the demand for steel, cement, power, CVs and capital goods. They have also requested for an institute for PPP and a portion of the SLR be apportioned for the Infra companies. In the case of the manufacturing the requests were to extend the phased manufacturing programme (PMP) to Air conditioner segment and the medical devices. They have also demanded the offset policy similar to that of the defence sector. On cluster development they have requested for a simulation cell, online plat form boost for cluster development and redefinition of the SMEs based on the turnover: Namely, less than 5 crores as micro; INR 5-75 Cr as small and INR 75-25 Cr as Medium. Further it is also requested that the adjusted bank credit be

increased from 7.5% to 12%, while the agriculture related recommendation was similar at CII press release the complete pre budget memorandum was not available. In the case of SIAM the slowdown was attributed to the BS VI challenge and the cost push inflation in the sector.

4. Key inference

The representations have not been deficient, but the academic validations are as important as the industry demands. They need to be balanced at the broad sectoral level. Just as the industry requests are validated logically, the academic validations also need to be questioned on the rationality and theoretical foundations. In other words, the on-ground business needs to be validated on logic and theoretical soundness for the firm decision making. The dis-connect is evident.

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