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Consumer Price Index and Index of Industrial Production and its impact on the Dow Jones

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ABSTRACT

A few key economic indicators that demonstrates performance of the any economy in general and US economy in particular are Consumer price Index, Index of Industrial Production and Dow Jones Industrial Average (Specific to US economy). To establish the relationship between the 3 a detailed analysis of the 3 indicators has been made based on secondary data published by Fred Economic Data for the last 60 years. It is a very interesting analysis and clearly establishes the impact of CPI and IIP on Dow Jones.

Keywords— *CPI, IIP, Dow Jones, Equity Market, USA, Industrial Growth, Inflation*

1. OBJECTIVES

- To understand the equity market of USA
- To understand the IIP index and CPI index
- To understand the effect of IIP and CPI separately on equity market
- To understand the effect of IIP and CPI simultaneously on equity market
- To find the regression of Dow Jones and IIP
- To find the regression of Dow Jones and CPI
- To find the regression of Dow Jones with CPI and IIP
- To find the correlation of Dow Jones and CPI
- To find the correlation of Dow Jones and IIP
- To analyze these data their regression and their correlation

2. INTRODUCTION OF THE DATA

The **Dow Jones Industrial Average** (DJIA) is an index that tracks 30 large, publicly-owned companies trading on the New York Stock Exchange (NYSE) and the NASDAQ. The Dow Jones is named after Charles Dow, who created it in 1896, and his business partner, Edward Jones. Often referred to as "the Dow," the DJIA is one of the oldest, single most-watched indices in the world. To investors, the Dow Jones is defined as a collection of blue-chip companies with consistently stable earnings that include Walt Disney Company, Exxon Mobil Corporation, and Microsoft Corporation. When the TV networks say "the market is up today," they are generally referring to the Dow. (Source: Investopedia)

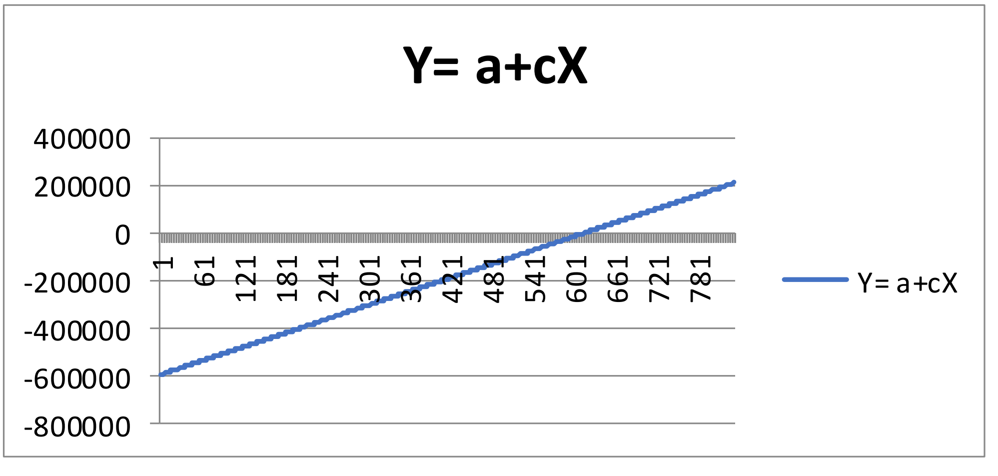
The **Industrial Production Index** (INDPRO) is an economic indicator that measures real output for all facilities located in the United States manufacturing, mining, and electric, and gas utilities (excluding those in U.S. territories). Since 1997, the Industrial Production Index has been determined from 312 individual series based on the 2007 North American Industrial Classification System (NAICS) codes. These individual series are classified in two ways - market groups and industry groups. The Board of Governors defines markets groups as products (aggregates of final products) and materials (inputs used in the manufacture of products). Consumer goods and business equipment can be examples of market groups. "Industry groups are defined as three digits NAICS industries and aggregates of these industries such as durable and nondurable manufacturing, mining, and utilities." The index is compiled on a monthly basis to bring attention to short- term changes in industrial production. It measures movements in production output and highlights structural developments in the economy. Growth in the production index from month to month is an indicator of growth in the industry. (Source: Fred economic data)

The **Consumer Price Index (CPI)** is a measure of the average change over time in the prices paid by urban consumers for a market basket of consumer goods and services. Indexes are available for the U.S. and various geographic areas. Average price data for select utility, automotive fuel, and food items are also available (Source: US House Of Labor Statistics)

3. DATA

				Rebased to 100		
Years	CPI	Industrial production	Dow Jones	CPI	Industrial production	Dow Jones
1950-03-31	24	15	206	100	100	100
1950-04-30	24	15	214	100.04	103.33	104.03
1950-05-31	24	16	223	100.55	105.74	108.45
1950-06-30	24	16	209	101.02	108.89	101.50
1950-07-31	24	17	209	101.82	112.41	101.60
1950-08-31	24	17	217	102.37	115.93	105.24
1950-09-30	24	17	226	102.96	115.19	109.85
1950-10-31	25	17	225	103.64	115.93	109.22
1950-11-30	25	17	228	104.06	115.74	110.44
1950-12-31	25	18	235	105.67	117.78	114.27
1951-01-31	25	18	249	107.36	118.15	120.79
1951-02-28	26	18	252	109.26	118.89	122.35
1951-03-31	26	18	248	109.48	119.44	120.35
1951-04-30	26	18	259	109.64	119.63	125.79
1951-05-31	26	18	250	109.94	119.26	121.18
1951-06-30	26	18	243	109.69	118.70	117.78
1951-07-31	26	17	258	109.60	116.85	125.17
1951-08-31	26	17	270	109.39	115.74	131.19
1951-09-30	26	17	271	110.11	116.48	131.63
1951-10-31	26	17	262	110.66	116.30	127.35
1951-11-30	26	18	261	111.34	117.22	126.83
1951-12-31	26	18	269	111.97	117.96	130.69
1952-01-31	26	18	271	111.89	119.26	131.40
1952-02-29	26	18	260	111.72	120.00	126.25
1952-03-31	26	18	269	111.63	120.37	130.80
1952-04-30	26	18	258	111.93	119.26	125.06
1952-05-31	26	18	263	111.97	118.15	127.64
1952-06-30	27	18	274	112.23	117.04	133.13
1952-07-31	27	17	280	112.86	115.19	135.70
1952-08-31	27	18	275	112.90	122.59	133.51
1952-09-30	27	19	271	112.65	127.04	131.36
1952-10-31	27	19	269	112.90	128.33	130.69
1952-11-30	27	20	284	112.90	130.93	137.69
1952-12-31	27	20	292	112.99	131.67	141.69
1953-01-31	27	20	290	112.69	132.04	140.66
1953-02-28	27	20	284	112.48	132.78	137.99
1953-03-31	27	20	280	112.65	133.89	135.85
1953-04-30	27	20	275	112.90	134.44	133.37
1953-05-31	27	20	272	112.94	135.18	132.17
1953-06-30	27	20	268	113.24	134.63	130.22
1953-07-31	27	20	275	113.32	136.30	133.67
1953-08-31	27	20	261	113.58	135.56	126.80
1953-09-30	27	20	264	113.75	132.78	128.17
1953-10-31	27	20	276	114.00	131.67	133.88
1953-11-30	27	19	281	113.58	128.52	136.58
1953-12-31	27	19	281	113.66	125.37	136.35

DATA WITH TOOLS WORKING ON IT

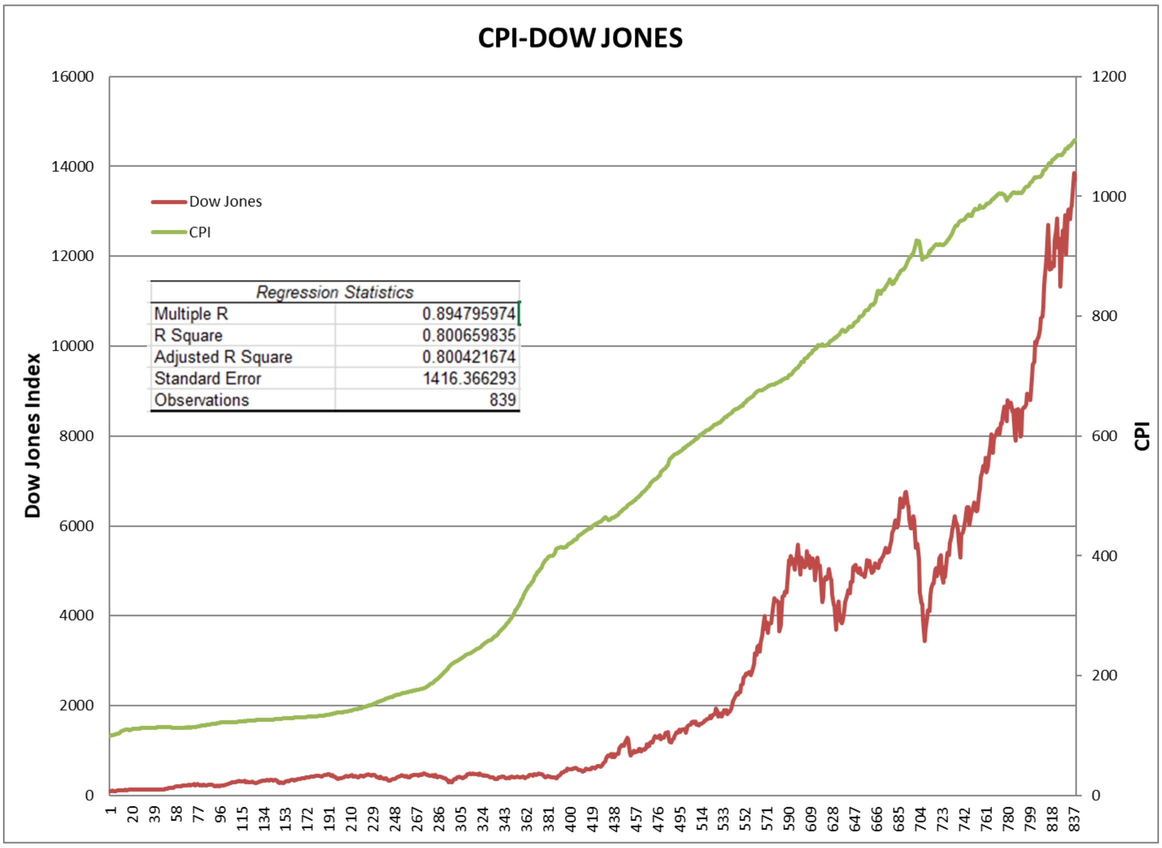


Note: Excel sheet showing detailed analysis using regression on the data and represented by charts can be accessed by double tapping on the above picture.

4. ANALYSIS

4.1 Consumer Price Index (CPI) and its impact on Dow Jones:

Consumer Price Index has a direct impact on consumption in the economy, various components of the cost of productions of Goods and Services and consequently on the performance of manufacturers and service providers. A detailed analysis of CPI as published by Fred Economic Data in the United States of America and Dow Jones index over a period from 1950 until date has been made and has been represented in the chart below. It can be clearly seen how CPI and Dow Jones move in tandem and show strong co-relationship. Statistical analysis and its interpretation have been provided below the chart.

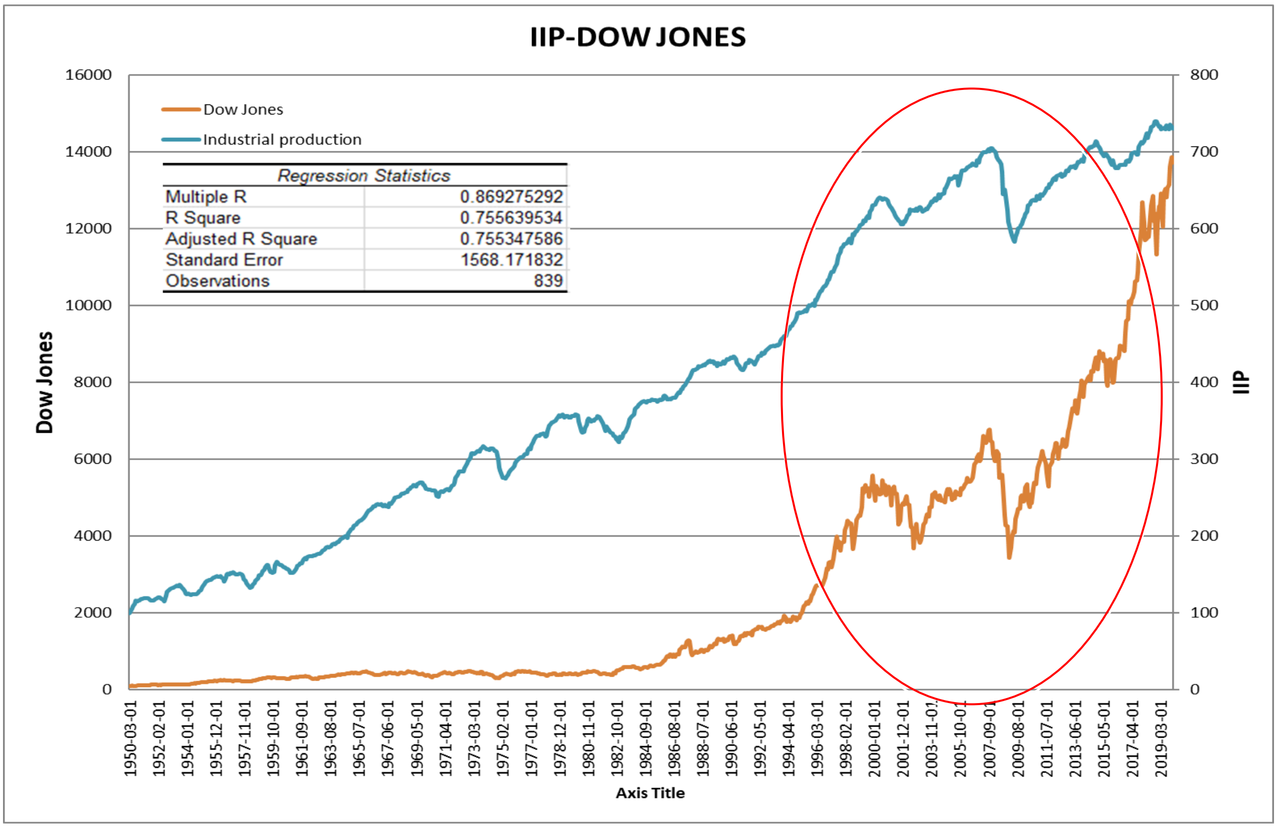


We can see a very strong correlation between CPI which is the inflation rate of USA and Dow Jones the equity market. This strong relation is shown by a constant of 0.894795. It is a direct relationship and a really strong one at that.

4.2 Index of Industrial Production (IIP) and its impact on the Dow Jones Index:

Index of Industrial Production represents the industrial output in the economy and is impacted directly by the way the economy is performing. Capital expenditure as well as the consumption in the economy impacts the production of goods and services and any changes in the same are easily visible immediately in the IIP.

A detailed study of the IIP as published by the Fred Economic Data from 1950 until date and its relationship with the Dow Jones Index that represents the performance of the various companies on the New York Stock Exchanges clearly demonstrates the linkage between the IIP and economic performance of the country represented by Stock Exchange Index.



We can see that the constant for correlation for IIP which is the index for industrial growth in the US market and Dow Jones the equity market is a whopping 0.869275 showing us a very strong relation. The Circle in red on the chart indicates various phases in the economy over the period of 2001 to 2019 where the relation ship between IIP and Dow Jones is very evident.

5. INTERPTRETATION

Perfect corellation is shown by 1 while High corellation is usually shown by more than 0.5-1. Low correlation is shown by 0-0.5 while 0 shows us no relation. Direct correlation is interpreted by saying that there is positive corelation and it means when one component increases the other one increases too but the increase in the other one depends on the correlation coefficient value. Similarly, indirect correlation or negative correlation tells us that the two components are working in opposite directions. So, when one increases the other component tends to decrease by the correlation coefficient component.

6. CONCLUSION

- There is a direct and positive correlation between CPI and equity market. We can also see a positive and high relationship between CPI and the equity market. So, we can also see the relation between inflation and equity market.
- There is a direct and positive correlation between IIP and equity market. It shows that when there is growth in the market (represented by growth in IIP) the equity markets also grow and vice versa. The equity market rises or falls at a percentage depending upon the correlation coefficient of IIP.

7. REFERENCES

[1] https://fred.stlouisfed.org/series/CPIAUCSL#0
[2] https://www.investopedia.com/
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