

REPORT SUBMITTED TO THE PLANNING AND POLICY SUPPORT  
UNIT SOCIETY OF STATE PLANNING COMMISSION OF MADHYA  
PRADESH, BHOPAL



# GROWTH PROJECTIONS OF STATE DOMESTIC PRODUCT OF MADHYA PRADESH

Dr. Ganesh Kawadia, Sujay S Phatak

APRIL 2018

PLANNING CHAIR OF STATE PLANNING COMMISSION ON  
MICRO ECONOMIC GOVERNANCE, SCHOOL OF ECONOMICS  
DEVI AHILYA UNIVERSITY INDORE, MADHYA PRADESH

This study aims at examining the effects and pattern of structural changes in Madhya Pradesh economy and estimation of its economic growth. Based on such foundations, this study continues to project the state of Madhya Pradesh's economy for the next decade. The overall economy is projected to grow around 11 percent by the end of this decade (2020-21), which will be majorly supported by agriculture and moderately by services. The analysis suggests that in order to get a more sustainable growth, the government should try to focus more on improving opportunities in secondary sector while making sure that growth in primary and secondary sectors is not hindered.

**Dr. Ganesh Kawadia** is the **Chair Head** of the **State Planning Commission's Chair on Micro Economic Governance** established by the State Planning Commission of Madhya Pradesh, Bhopal at the School of Economics, Devi Ahilya University Indore. Being an accomplished Ex-Professor and retired Head of School of Economics, Devi Ahilya University Indore, he has published nine books and more than 70 research articles in national/international journals. His visionary leadership brought many laurels to the School of Economics under his Headship which include; financial support under **UGC-SAP at DRS Phase – III**, department being identified as a **“Center with Potential for Excellence” (CPEPA)** by the **University Grants Commission, New Delhi** and awarded as a **“Centre for Excellence in Teaching and Research”** by **Government of Madhya Pradesh, Bhopal**. He has been an eloquent public speaker having delivered several addresses in various national and international seminars on Indian Economic Policy Issues, many of which were part of live telecast programs on **UGC EDUSAT Gyanvani Channel**.

**Sujay S Phatak** is a **Project Fellow** under the **University Grant Commission's Special Assistance Program** at School of Economics, Devi Ahilya University of Indore. He is involved into a series of research projects on various themes under his position and is currently pursuing his PhD in economics at the same department. A co-author of several reports on different issues of policy implication for the State Planning Commission, Government of Madhya Pradesh (India) and a regular contributor of sections in numerous books, he has authored a monograph along with many research papers in his career. His primary research inclination is in the economics of education, subject area of his PhD dissertation while most of his research works are on economic development, sustainability, innovation, employment and inclusive growth. His areas of academic interest include econometrics, mathematical economics and history of economic thought.

**For further details write to**

**Chair on Micro-Economic Governance**

**Chair on Micro-Economic Governance**

**Coordinator: Dr. Kanhaiya Ahuja.** Phone: +91-99260-20907 | Email: kanhaiya.ahuja@gmail.com

**Chair Head: Dr. Ganesh Kawadia.** Phone: +91-94253-52521 | Email: ganesh.kawadia@gmail.com

School of Economics, Devi Ahilya University

Takshashila Parisar, Khandwa Road, Indore.

Phone: +91-731-2361087/2363088 (fax) | Email: enquiry@soedavv.ac.in | website: www.soedavv.ac.in

## Executive Summary

1. This study aims at examining the effects and pattern of structural changes in Madhya Pradesh economy and estimation of its economic growth. Based on such foundations, this study continues to project the state of Madhya Pradesh's economy for the next decade.
2. To project the economy and measure shifts in various sub-sectors, a few semi-log functions are used:

$$\log Y_t = \beta_0 + \beta_1 t + \beta_2 D + \beta_3 D * t + u_t$$

The above model is used when shift is seen and growth after shift is significant. When both dummy and time-dummy interaction variables are insignificant, the CAGR (along with economic projections) is calculated using the following model:

$$\log Y_t = \beta_0 + \beta_1 t + u_t$$

When only interaction variable is insignificant, the model transforms to –

$$\log Y_t = \beta_0 + \beta_1 t + \beta_2 D + u_t$$

CAGR for before and after shift periods is calculated by keeping the value of  $D$  equal to zero for pre-shift period and one for post shift period.

3. Agriculture, among the sub-sectors of Primary Sector, came out to be the fastest growing sector with over 16 percent post shift projected CAGR

(escalated from 1.28 percent in the pre shift era, shift year being 2008-09) in agriculture by 2020-21. While Forestry and Logging did not see a shift and is the slowest growing sub-sector (constant growth of 1.18 percent), Fisheries saw the largest difference in pre and post shift period CAGRs (23.52 percent before shift and 3.47 percent after shift). It is therefore suggested that the government should focus more on fisheries so that the sector could get back on the track of high growth, as it was before the shift. The overall CAGR of the primary sector is project at 16.27 percent by 2020-21. Surprisingly, secondary sector is the slowest growing sector in the economy with only approximately six percent year over year growth (CAGR projected at 6.29 percent by 2020-21). Manufacturing has the least growth in the sector (1.93 percent) while electricity, gas and water supply growing at a CAGR of 10.21 percent. Construction sector is projected to grow at a moderate CAGR of 8.72 percent. Tertiary sector is performing moderately well among the three sectors, which is projected to be grow over eight percent by 2020-21.

4. The overall economy is projected to grow around 11 percent by the end of this decade (2020-21), which will be majorly supported by agriculture and moderately by services.
5. The analysis suggests that in order to get a more sustainable growth, the government should try to focus more on improving opportunities in secondary

sector while making sure that growth in primary and secondary sectors is not hindered. It is further suggested that the government should also try to capture the excessive growth in agriculture by improving the forward and backward linkages of industries and services with agriculture. This is because if the massive output of the primary sector is not absorbed by secondary and tertiary sectors, all the progress will go in vain. Therefore, integration of manufacturing and services with agriculture is much needed at this hour.

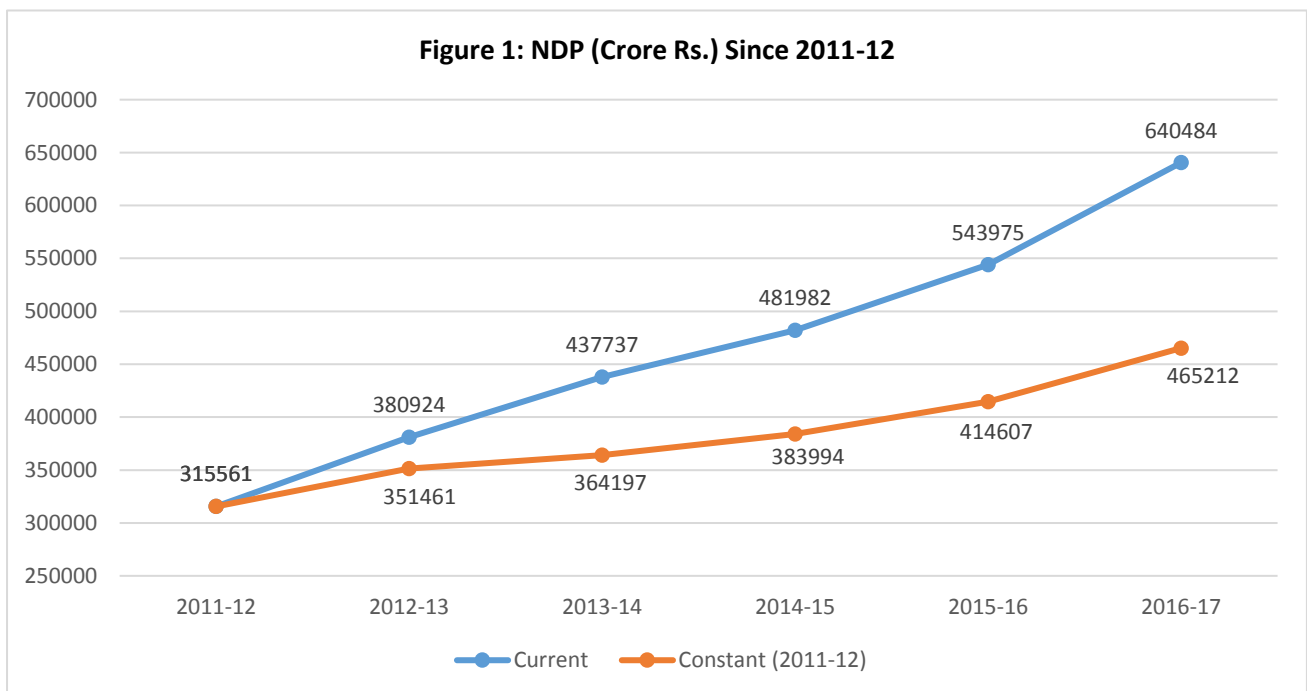
**Keywords:** Economic Forecasting, Economic Projections, Madhya Pradesh Economy

## Abbreviations

Title	Abbreviation
Madhya Pradesh	MP
Compound Annual Growth Rate	CAGR
Net State Domestic Product of MP (Constant Prices) (2004-05) (I+II+III)	NDP
Per Capita Net State Domestic Product (NDP/Population of MP)	PCNDP
Primary Sector (1+2+3)	PRY
Agriculture	AGR
Forestry and Logging	FNL
Fishing	FSH
Secondary Sector (4+5+6+7)	SND
Mining and Quarrying	MNQ
Manufacturing	MFT
Electricity, Gas and Water Supply	EGW
Construction	CNR
Tertiary Sector (8+9+10)	TRY
Trade, Hotels, Transport, Storage and Communication	TSC
Financing, Insurance, Real Estate and Business Services	FRB
Community, Social and Personal Services	CSP
Primary Sector	PRY
Secondary Sector	SDY
Tertiary Sector	TRY

## Introduction

Growth of any economy depends on the performance of its sectors. When the sectors undergo structural changes, the process creates an enhancing effect on the economic aggregates and the economy expands by following a path of growth. The economic transformation in Madhya Pradesh (MP) can be seen as a classic example of this process. An in-depth look at the State's economy easily suggests that over the period, it has expanded itself to reach whole new levels of growth, but with a peculiar transformation in its structural formation. A few years after the independence, the manufacturing sector nourished in the State but the trend has reverted since then towards services in the reform phases to agriculture after Chhattisgarh was carved out of MP.

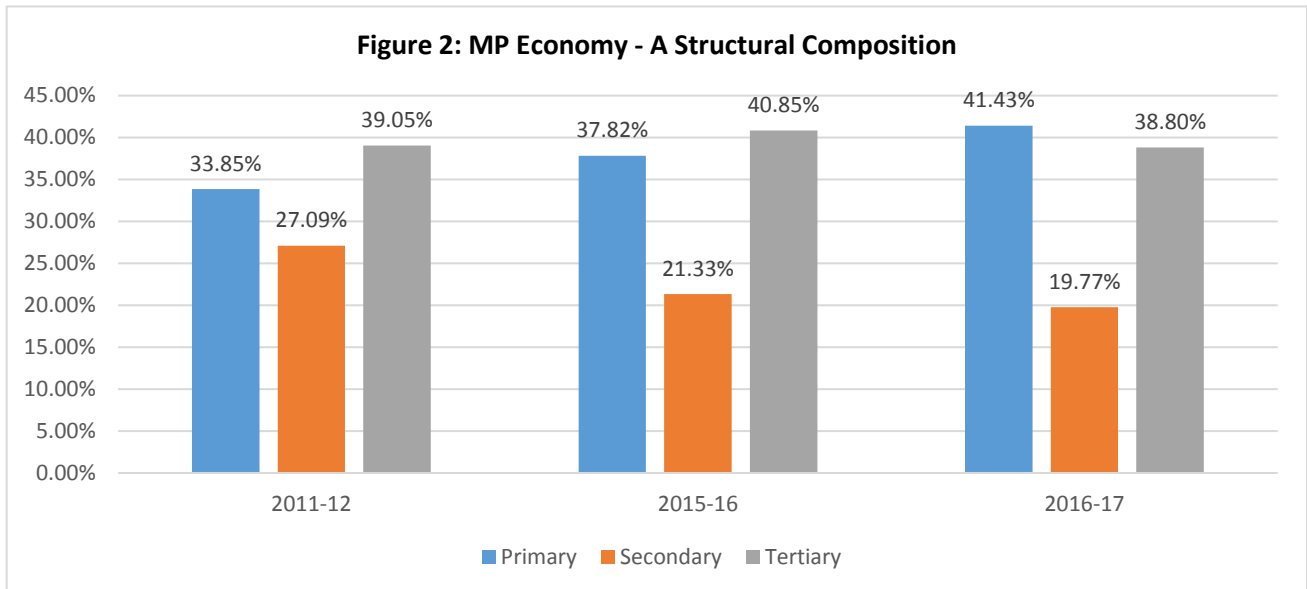


Source: Economic Survey of Madhya Pradesh, 2016-17

While the overall economy grew moderately in the last two decades, the structural growth rates show a high variation in their growth patterns. The Economic Survey of Madhya Pradesh (2016-17) found the economy to be growing at 12.21 percent during FY 2016-17 (AE) as against a lower rate of 7.97 percent in FY 2015-16 (RE). Figure 1 shows the growth of the state economy since 2011-12 at constant (2011-12) prices and current prices. The curved line, along with the figures indicate that the economy has grown at an increasing rate.

The variation, which can be mapped through a notable growth of agriculture in the last few years, can be understood with the help of figure 2 which shows the share of sectors in the state economy in 2011-12, 2015-16 and 2016-17. We can see that the share of agriculture has grown from 33.85 percent (2011-12) to 41.43 percent (2016-17 AE). While the services saw a steady decline of around one percent (from 39.05 % in 2011-12 to 38.80 % in 2016-17), manufacturing sector is massively affected as the decline in its share is quite alarming (see in figure 2 that the percentage share of manufacturing has gone down from 27.09 % in 2011-12 to 19.77 % in 2016-17).





Source: Economic Survey of Madhya Pradesh, 2016-17

Here, it is evident to note that economy of the State is now driven by agriculture and from the tag of a BIMARU state, MP is now leading in production of many agriculture products. The State is also one of the fastest growing states in India. The interlinkages between the sectors and their potential impact on the economy is seen as a prospective area of research. Thus, forecasting such an interesting economy is evident in such times. In this context, this study tries to examine the effects and pattern of structural changes in Madhya Pradesh with their impact on its economic growth. Based on such foundations, this study continues to project the state of Madhya Pradesh's economy for the next decade. The specific objectives are as follows:

1. Analyze the trend of growth trajectory of Madhya Pradesh's Net State Domestic Product
2. Project the economy of MP up till 2021 on the basis of sectorial projections

## Theoretical Background

Forecasting is a very vast and popular subject area in economics. The forecasting of Indian economy has been attempted by many in the past. Though the objectives were distinct, many methodologies have been introduced to this subject in the past and this paper draws some of them to project the state of Madhya Pradesh's economy, such as an ample of economists such as Rao and Narayana (1987), Bharadwaj and Chadha (1991) and Sastry et.al. (2003) have used Input-Output Analysis to examine the interactions (or linkages) between different sectors of the economy. Many authors have used other methods may it be analysis of structural changes in the Indian economy by Rao (1979) which uses the National Accounts Data or using demand side analysis to understand the determinants of service sector growth in the State economies in India (Chakravarty, 2006). However, this study follows Kawadia (2000, 2002 and 2009) in its methodology.

## Methodology

The data used in this study is taken from *indiastat* data portal. Since the study is set in post liberalization period, the time series was taken from 1993-94 to 2014-15. Net State Domestic Product (NDP) of Madhya Pradesh by economic activity is used to forecast the State's economy and to analyze the reasons of such outburst growth in the State.

The state economy is divided into ten subsectors viz. Agriculture; Forestry and Logging; Fishing; Mining and Quarrying; Manufacturing; Electricity, Gas and Water Supply; Construction; Trade, Hotels, Transport, Storage and Communication; Financing, Insurance, Real Estate and Business Services; and Community, Social and Personal Services. For ease of use, we have coded the variables as shown in table 1. Total size of the State economy is thus the aggregation of all these subsectors. The growth performance of all the subsectors cannot be uniform over a period of time. We thus have applied various models to these sub-sectoral time series so as to examine if growth is constant during this period or there is a shift and whether the growth is accelerating after the certain point of shift.

**Table 1: Variables and their Codes**

<b>Sr.</b>	<b>Variable</b>	<b>Code</b>
<b>I</b>	<b>Net State Domestic Product of MP (Constant Prices) (2004-05) (I+II+III)</b>	<b>NDP</b>
<b>II</b>	<b>Per Capita Net State Domestic Product (NDP/Population of MP)</b>	<b>PCNDP</b>
<b>III</b>	<b>Primary Sector (1+2+3)</b>	<b>PRY</b>
1	Agriculture	AGR
2	Forestry and Logging	FNL
3	Fishing	FSH
<b>IV</b>	<b>Secondary Sector (4+5+6+7)</b>	<b>SND</b>
4	Mining and Quarrying	MNQ
5	Manufacturing	MFT
6	Electricity, Gas and Water Supply	EGW
7	Construction	CNR
<b>III</b>	<b>Tertiary Sector (8+9+10)</b>	<b>TRY</b>
8	Trade, Hotels, Transport, Storage and Communication	TSC
9	Financing, Insurance, Real Estate and Business Services	FRB
10	Community, Social and Personal Services	CSP

This is examined using following methodology:

Compound Annual Growth Rate (CAGR) is used as a basic tool to examine the economic growth of Madhya Pradesh. Many Semi Log Regression Functions are used to calculate the Compounded Annual Growth Rate.

Apart from CAGR, these semi-log functions are also used to assess shifts, changes in the growth rate before and after the shift and future projections of the series. These models are adjusted for different variables based on the level of significance and goodness of fit of these models in their results.

The first model used is –

$$\log Y_t = \beta_0 + \beta_1 t + \beta_2 D + \beta_3 D * t + u_t$$

Log of  $Y_t$  (NDP) is taken as the function of time ( $t$ ), time dummy ( $D$ ) and the interaction variable (time\*dummy). The value of dummy is taken as zero before the shift and one thereafter. Thus, the equation of a before shift (keeping the value of  $D$  as zero) period transforms to:

$$\text{Log } Y_t = \beta_0 + \beta_1 t + u_t$$

The slope of this model is  $\beta_0$  and the intercept becomes  $\beta_1$  the slope. The equation can thus be used to calculate the CAGR (see that this is the exact equation derived above). Similarly, equation of the after shift (keeping the value of  $D$  as one) period transforms to:

$$\mathbf{Log Y}_t = (\beta_0 + \beta_2) + (\beta_1 + \beta_3) * t + u_t$$

The model now includes two betas to form the intercept ( $\beta_0$  and  $\beta_2$ ) while the slope coefficient now  $\beta_1$  and  $\beta_3$  together. From this equation, we have calculated the value of  $Log Y_t$  for future values of time, the antilog of which shows the projected values of NDP by economic activities. The significant coefficient of interaction variable shows an increasing rate of growth after the shift period. If the interaction of time and dummy is inconsistent, the model is then revised by excluding the interaction variable and re-regressing the remaining variables. The model thus transforms to –

$$\mathbf{log Y}_t = \beta_0 + \beta_1 t + \beta_2 D + u_t$$

See that now if we keep the value of  $D$  to be equal to unity (one), the slope coefficient is changed to  $\beta_1$  rather than  $\beta_1 + \beta_3$  combined. This implied that the after shift model is growing at a constant rate. Further, if both dummy and interaction variables are insignificant, the model is again revised to its basic form, i.e. –

$$\mathbf{log Y}_t = \beta_0 + \beta_1 t + u_t$$

Here, log of  $Y_t$  (NDP) is taken as the function of time ( $t$ ). This is the exact model used to calculate CAGR. This depicts that the dummy and (or) interaction of the dummy with time are insignificant for that particular variable. Table 2 shows the regression results based on these models. As can be seen, all the sub-sectors of agriculture (except forestry and logging) along with all the services are based on the first model as all the betas are significant. This implies that these sub-sectors are growing at an

increasing rate after experiencing shifts in growth. See that forestry and logging are not showing any substantial shift as both the dummy and interaction variables are insignificant in the results. Therefore, the projections of forestry and logging are based solely on time. Further, all the sub-sectors of industry are showing an insignificant  $\beta_3$  but a significant  $\beta_2$ . This indicates that the growth in the secondary sector has seen a period of shift but it has been growing at a constant rate thereafter.

**Table 2: Regression Results**

Sector	$\beta_0$	$\beta_1$	$\beta_2$	$\beta_3$	R <sup>2</sup>
<b>Agriculture</b>	5.347257	0.005523	-1.01574	0.061674	0.896
p-value	4.61E-32	0.047724	0.000277	5.44E-05	
<b>Forestry and Logging</b>	4.467478	0.005105	<b>N/A</b>	<b>N/A</b>	0.774
p-value	2.64E-43	6.81E-08	<b>N/A</b>	<b>N/A</b>	
<b>Fishing</b>	2.903032	0.091727	0.269714	-0.0769	0.909
p-value	9.88E-23	2.55E-06	0.000116	2.66E-05	
<b>Mining &amp; Quarrying</b>	4.45284	0.02056	-0.065284	<b>N/A</b>	0.962
p-value	1.66E-31	1.03E-14	0.038866	<b>N/A</b>	
<b>Manufacturing</b>	4.94231	0.008308	0.141381	<b>N/A</b>	0.850
p-value	4.12E-32	0.017237	0.003239	<b>N/A</b>	
<b>Electricity, Gas &amp; Water Supply</b>	3.760662	0.042205	-0.2167	<b>N/A</b>	0.849
p-value	8.55E-27	3.28E-07	0.006167	<b>N/A</b>	
<b>Construction</b>	4.325772	0.036322	0.222981	<b>N/A</b>	0.991
p-value	2.14E-36	9.49E-15	1.95E-08	<b>N/A</b>	
<b>Trade, Hotels, Transport, Storage &amp; Communication</b>	5.225147	0.015038	-0.09169	0.016979	0.999
p-value	1.84E-31	6.5E-09	8.75E-07	1.44E-08	
<b>Financing, Insurance, Real Estate &amp; Business Services</b>	4.806785	0.022619	-0.26928	0.020151	0.996
p-value	4.41E-39	2.19E-12	3.21E-09	4.2E-09	
<b>Community, Social &amp; Personal Services</b>	4.893556	0.02283	-0.26215	0.015708	0.981
p-value	2.65E-35	1.86E-09	6.22E-05	0.000222	

The projected values are calculated using the above regression models. All the sub-sectors are added up to form the specific sector, i.e. agriculture, forestry and logging, and fishing together constitute the agriculture sector.

Similarly mining & quarrying, manufacturing, electricity, gas & water supply and construction add up to form the industry sector while trade, hotels, transport, storage & communication, financing, insurance, real estate & business services and community, social & personal services are parts of service sector. The models were finalized on the basis of the goodness of fit ( $R^2$ ). The interlinkages between agriculture and industry is assessed using two functions assuming industry to be a function of agriculture and vice-versa.

## Projecting the Economy

We have tried different dummies to test the shift in the growth rate. Many of these sectors have also shown acceleration in growth rate as all of the betas were significant and  $\beta_3$  came out to be positive in regression. We therefore have used different growth models for these subsectors to get the projections (see table 2). Table 2 shows the regression results for all the models used. It reveals that all the sub-sectors except Forestry and Logging have been affected by a shift. But after the shift, agriculture and services are accelerating their growth at an increasing rate while the secondary sector has a constant growth. To look more deeply in to the

matter, we have calculated the year over year (YoY) growth for the sub-sectors. To make the study more evaluative, instead of using one rate of growth as suggested by the model, we have calculated a range of expected growth rate by using the formula: ***Growth Range*** =  $\beta \pm (1.96 * \sigma_{\bar{x}})$  where  $\beta$  is the slope coefficient of the model, and  $(1.96 * \sigma_{\bar{x}})$  defines data at 95 percent confidence level. In this respect, table 3 (and figure 3) shows the year of shift, pre-shift and post-shift CAGRs and projected growth ranges of primary, secondary and tertiary sectors from 2015-16 to 2020-2021 (see table 4 and annexures for projected values). CAGR is calculated for all the sub-sectors using the semi-log model(s).

**Table 3: Period of Shift and Projected Sectoral Growth Rates (2015-16 to 2020-21) of MP Economy**

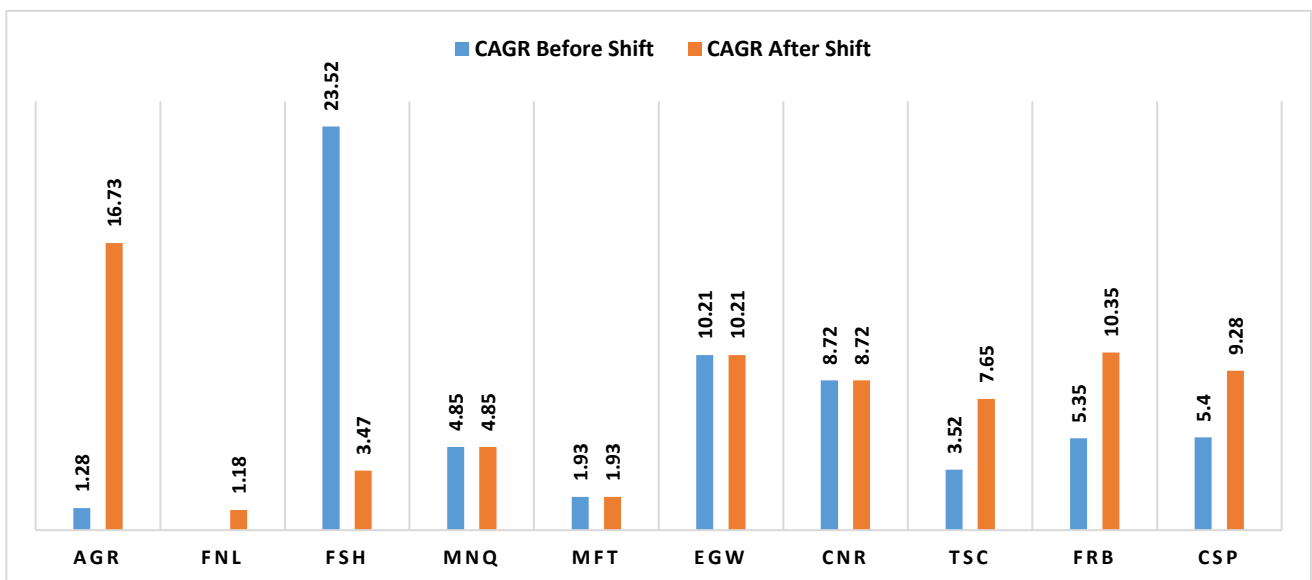
Sector	Shift Year	CAGR		Projected Growth (2016-17 to 2020-21)	
		Before Shift	After Shift	Upper Band	Lower Band
AGR	2008-09	1.28	16.73	24.54	9.41
FNL	No Shift		1.18	1.46	0.90
FSH	1997-98	23.52	3.47	17.07	- 8.55
PRY	N/A	N/A	N/A	N/A	N/A
MNQ	1993-94	4.85	4.85	5.31	4.39
MFT	2006-07	1.93	1.93	3.41	0.48
EGW	2002-03	10.21	10.21	12.99	7.49
CNR	1998-99	8.72	8.72	9.56	7.89
SND	N/A	N/A	N/A	N/A	N/A
TSC	2005-06	3.52	7.65	8.78	6.53
FRB	2003-04	5.35	10.35	11.99	8.73
CSP	2004-05	5.40	9.28	12.02	6.61
TRY	N/A	N/A	N/A	N/A	N/A
NDP	N/A	N/A	N/A	N/A	N/A

A large variability is observed in the time of shift for the variables. See that 2008-09 has emerged as shift in the growth rate for agriculture while fishing saw a shift in the year 1997-98. It is also interesting to note that the tertiary sector has seen a shift



mostly during 2003-2006. It is surprising to note that all the subsectors of industry are showing no acceleration in its already poor rate of growth. This sector has grown at around 5 percent with manufacturing growing at an alarmingly low average of 1.93 percent annually, having potential to grow between 0.48 percent and 3.41 percent by 2020-21.

**Figure 3: CAGR of Various Sectors of State Domestic Product**



Source: Based on author's calculations

This growth rate seems quite deplorable because the State Government has tried to pump the growth of industries by organizing various schemes (like MP Investor's Summit or Make in MP) from time to time. Agriculture came out to be the fastest growing sector in the economy with over 16 percent CAGR (ranging between 9.41 percent and 24.54 percent till 2020-21) while Forestry and Logging is the sector with lowest growth rate (1.18 percent, ranging from 0.90 percent to 1.46 percent). Agriculture has the highest post-shift acceleration as before shift, the sub-sector

grew very poorly (CAGR of 1.28 percent) while post-shift CAGR is catastrophically increased to 16.73 percent, still having a potential to grow at 24.52 percent. Fisheries on the other hand has the largest fall from a CAGR of 23.52 percent before shift growth to a 3.47 percent after shift CAGR, with lower end of projected growth being a negative growth rate of -08.55 percent and upper end being 17.07 percent. This shows that fisheries has the highest range of growth. Secondary sector is seen to have a constant growth after shift period. This can be justified by the insignificant coefficient of  $\beta_3$  (see table 2). Electricity, Gas and Water Supply (EGW) can be mapped as the main driver of secondary sector (with 10.21 percent CAGR) and can grow at 12.99 percent by 2020-21, which is the upper end of its growth in range, the lower being 7.49 percent. All other sub-sectors under the secondary sector aren't performing well. Moreover, construction can be said to aid EGW in pushing the industrial sector with a CAGR of 8.72 percent, ranging between 7.89 percent and 9.56 percent by 2020-21). Variations in pre-shift and post-shift periods can also be seen among the services, having a positive post shift increment in their growth rate. See that TSC (3.52 to 7.65, ranging between 6.53 percent and 8.78 percent), FRB (5.35 to 10.35, ranging between 8.73 percent and 11.99 percent) and CSP (5.4 to 9.28, ranging between 6.61 percent and 12.02 percent) (see table 1 for codes) have nearly doubled their CAGR in the post shift period. If we talk of the overall economy, the NDP is projected to grow over 10 percent by 2020-21 (see table 4 and figure 4).

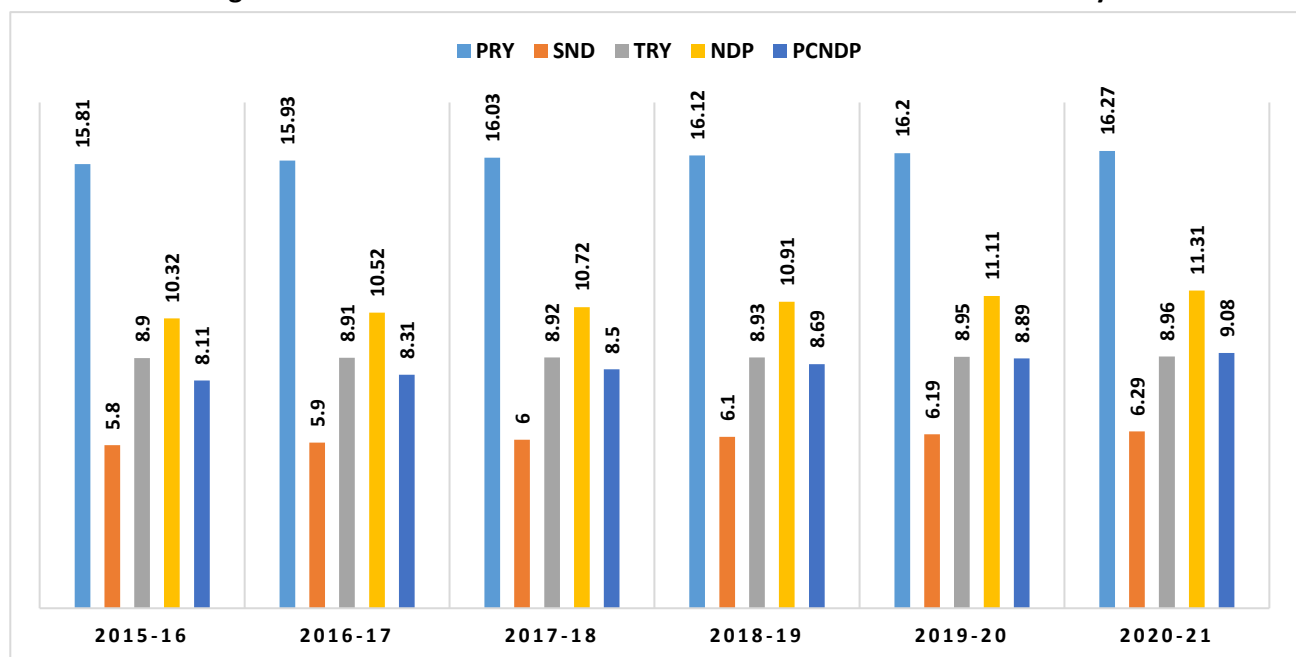
In the same regard, table 4 shows the projections for primary, secondary and tertiary sectors along with the projected NDP (see figure 5) and Per Capita NDP of the State.

**Table 4: NDP and Per Capita NDP Projections**

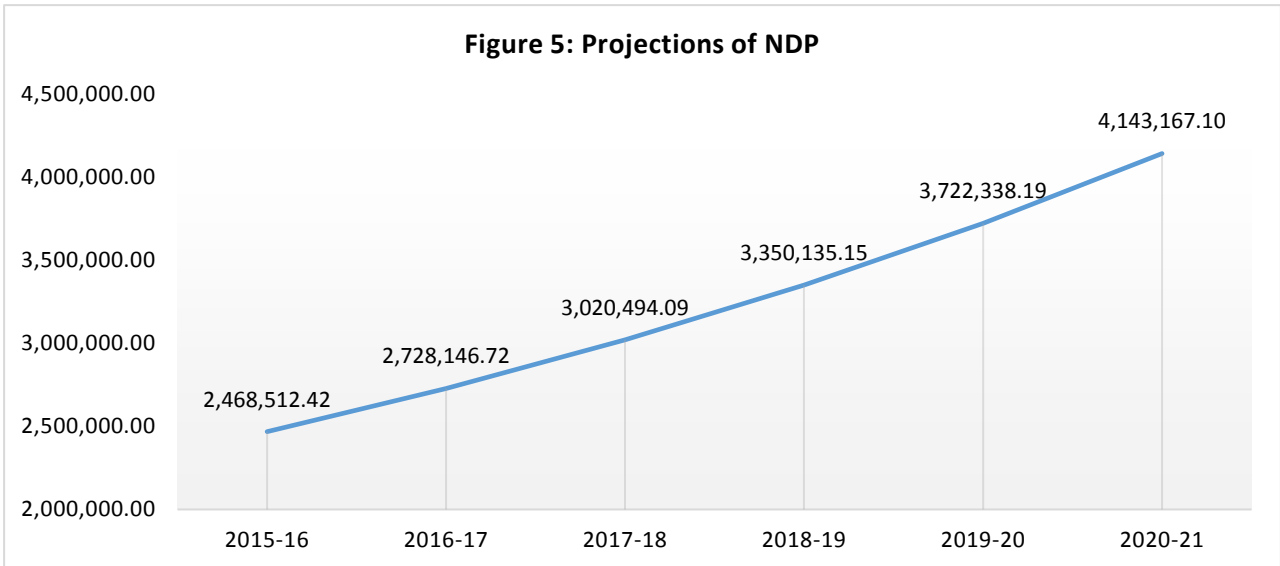
Year	PRY	YoY	SND	YoY	TRY	YoY	NDP	YoY	PCNDP	YoY
2015-16	795,172.37	15.81	535,677.44	5.80	1,137,662.62	8.90	2,468,512.42	10.32	30,720.48	8.11
2016-17	921,824.21	15.93	567,293.33	5.90	1,239,029.19	8.91	2,728,146.72	10.52	33,271.95	8.31
2017-18	1,069,584.26	16.03	601,333.40	6.00	1,349,576.43	8.92	3,020,494.09	10.72	36,099.94	8.50
2018-19	1,241,983.41	16.12	638,002.82	6.10	1,470,148.92	8.93	3,350,135.15	10.91	39,238.17	8.69
2019-20	1,443,143.40	16.20	677,524.70	6.19	1,601,670.09	8.95	3,722,338.19	11.11	42,724.81	8.89
2020-21	1,677,875.64	16.27	720,141.81	6.29	1,745,149.65	8.96	4,143,167.10	11.31	46,603.08	9.08

Alongside the projections, the Year over Year expected growth rate is also mentioned in the table. It can be seen that Secondary sector is growing a bit moderately while primary and tertiary sectors seem to be the main drivers of the double digit economic growth in Madhya Pradesh.

**Figure 4: Year over Year Growth of Different Sectors of the State Economy**

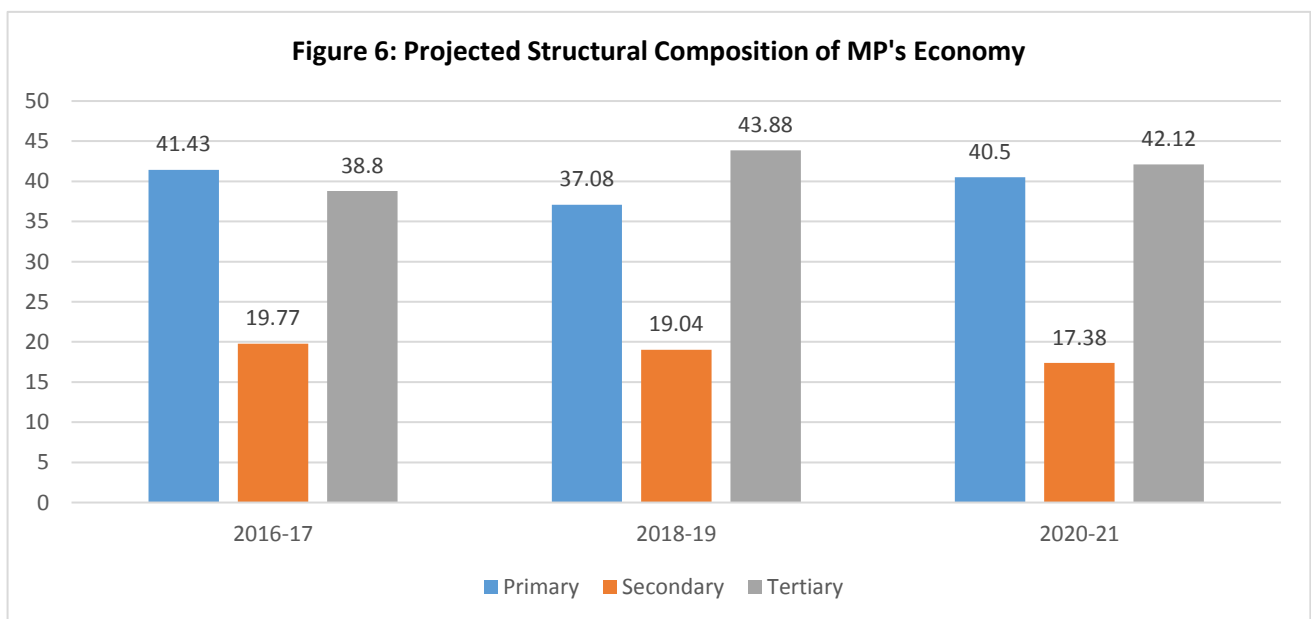


Source: Based on author's calculations



Source: Based on author's calculations

The main leg-puller in this growth seems to be the manufacturing sector as despite several attempts made by the government, the ground realities are not changing for this sub-sector. Mining and Quarrying is also not contributing much to the overall growth with CAGR around 4.85 percent. Having described the path of growth and the sectoral changes, it is now evident to highlight their impact on the state of Madhya Pradesh's economy.



Source: Based on author's calculations

Further, it can be seen that the sectoral composition of the economy is projected to remain somewhat constant till 2020-21 (see Figure 6). Figure 6 shows that the primary sector, contributing to 41.43 percent share in the economy (2016-17) is projected to contribute 40.5 percent share by 2020-21. Similarly, secondary sector also has a projected share of 17.38 percent by 2020-21 (lower than 19.77 percent in 2016-17). Conversely, the share of tertiary sector is projected to increase from 38.8 percent (in 2016-17) to 42.12 % (in 2020-21).

The analysis strongly portrays that the State economy is growing with the support of primary sector (around 16 percent) and services (near to nine percent). This growth, although moving at a fast and better pace, seems much incomplete and less inclusive and sustainable. This is because sustainable and long term growth can be achieved only through smooth interactions between all the sectors. But as it seems, the case in Madhya Pradesh is a bit different. Manufacturing (or the secondary sector) is supposed to be the link between agriculture and services, i.e. the manufacturing sector needs to absorb the output provided by the primary sector and meet the consumption demand generated in the economy. But in Madhya Pradesh, agriculture and services are growing at a pace with which manufacturing is not able to cope up and the problem is supposed to be there in near future. The secondary sector is neither able to absorb the primary sector output nor is successfully meeting the consumption demand, thus generating problems such as market failure (seen as the

nationwide infamous '*Kisaan Aandolan*' for interest waiver), inflation and other problems. This inability of service sector is holding back the potential in primary sector created by the State Government in recent years. If manufacturing is unable to back the potential of primary sector in MP, many of the efforts done by the government (in achieving tremendous growth in the sector) will be wasted. It is therefore very important for the State Government to boost up manufacturing from its sluggish growth rate and set up new industries which are able to support the agriculture output and are able to cope up with the increasing demand.

## Conclusion

With a purview to project the state economy of Madhya Pradesh based on select literature, this study derived a methodology to examine the effects and pattern of structural changes in the State with their impact on its economic growth. It further analyzed the inter-sectoral interlinkages with its locus set towards manufacturing and agriculture. Based on such foundations, we continued to project the state of Madhya Pradesh's economy for the next decade. The results of this study are quite interesting. We observed that Madhya Pradesh derives its growth from agriculture. With a tremendous over 16 percent growth, agriculture is boosting the economy of the State to achieve a faster growth. The reason is government's tremendous focus on boosting agriculture production by framing adequate policies. As of now, Madhya Pradesh has successively bagged the five Krishi Karman Awards in the last five years,

this time for highest production of wheat during the year 2015-16. This shows that the State economy is moving at a faster pace in agriculture than services or industries. But, the Fisheries has a poor post shift growth indicating that its performance has degraded over time. It is thus essential for the government to implement certain measures which would aid the fisheries sector to get back on the track of high growth. Industries on the other hand are facing a tough time. Very poor growth has been observed in the manufacturing sector, which seems rather surprising as the government has worked really hard to make MP the manufacturing hub of India. All the hard work does not seem to cultivate the same results as agriculture as the government is not able to pump new operational opportunities in the State. The tertiary sector seem to be in good shape in the economy and is projected to grow over 11 percent by 2020-21. But in order to get a more sustainable growth, the government should try to focus more on improving opportunities in secondary sector while making sure that growth in primary and tertiary sectors is not hindered. Also, the government should try to capture the excessive growth in agriculture by improving the forward and backward linkages of industries and services with agriculture. This is because if the massive output of the primary sector is not absorbed by secondary and tertiary sectors, all the progress will go in vain. Therefore, integration of manufacturing and services with agriculture is much needed at this hour.

## References

- Bharadwaj, R. N., & Chadha, R. (1991). Sources of Growth and Inter-Industry Linkages in Indian Economy with Special Reference to the Manufacturing Sector. *Indian Economic Review*, 26(2), 189-219.
- Chakravarty, D. (2006, July 8-21). Growing Services in India: An Inter-Sectoral Analysis Based on State-Level Data. *Economic and Political Weekly*, 41(27/28), 3061-3065+3067.
- Kawadia, G. (2000, June). Economic Growth and Structural Change in Madhya Pradesh Economy. *Man & Development*, 104-114.
- Kawadia, G. (2002, March). Trends and Directions of India's Growth Process (1980-81 to 1999-2000). *Man & Development*, 28-36.
- Kawadia, G. (2009). Growth and Development Perspectives in Madhya Pradesh. *XX Annual Conference of the Madhya Pradesh Economic Association (MPEA)*, (pp. 1-23). Gwalior.
- M., S. B. (2005, July 23-29). India's Recent Economic Growth: Some Limits and Limitations. *Economic and Political Weekly*, 40(30), 3249-3252.
- Ramachandra Rao, K. S., & Narayana, S. L. (1987, November 28). Measurement of Technological Changes in Indian Economy, 1968-69 to 1979-80. *Economic and Political Weekly*, 22(48), M122-M125+M127-M130.
- Rao, V. R. (1979, December 15). Changing Structure of Indian Economy: As Seen through National Accounts Data. *Economics and Political Weekly*, 14(50), 2049-2051+2053-2058.
- Sastry, D., Singh, B., Bhattacharya Kaushik, & Unnikrishnan, N. (2003, June 14-20). Sectoral Linkages and Growth Prospects: Reflections on the Indian Economy. *Economic and Political Weekly*, 38(24), 2390-2397.



# Annexures

Annexure I

## Primary Sector Projections

Year	AGR	FNL	FSH	PRY
2000-01	73,977.09	32,234.58	1,955.88	108,167.55
2001-02	86,356.43	32,615.76	2,023.80	120,995.99
2002-03	100,807.34	33,001.45	2,094.07	135,902.86
2003-04	117,676.46	33,391.70	2,166.78	153,234.94
2004-05	137,368.47	33,786.56	2,242.02	173,397.05
2005-06	160,355.74	34,186.10	2,319.87	196,861.71
2006-07	187,189.70	34,590.35	2,400.43	224,180.49
2007-08	218,514.07	34,999.39	2,483.78	255,997.24
2008-09	255,080.27	35,413.27	2,570.03	293,063.56
2009-10	297,765.45	35,832.03	2,659.27	336,256.76
2010-11	347,593.59	36,255.76	2,751.61	386,600.96
2011-12	405,759.99	36,684.49	2,847.16	445,291.63
2012-13	473,659.95	37,118.29	2,946.02	513,724.26
2013-14	552,922.32	37,557.22	3,048.32	593,527.86
2014-15	645,448.47	38,001.34	3,154.17	686,603.97
2015-16	753,457.96	38,450.71	3,263.69	795,172.37
2016-17	879,541.79	38,905.40	3,377.02	921,824.21
2017-18	1,026,724.51	39,365.46	3,494.28	1,069,584.26
2018-19	1,198,536.82	39,830.97	3,615.62	1,241,983.41
2019-20	1,399,100.25	40,301.98	3,741.17	1,443,143.40
2020-21	1,633,226.00	40,778.56	3,871.08	1,677,875.64

### Secondary Sector Projections

Year	MNQ	MFT	EGW	CNR	SND
2000-01	35,646.54	141,305.18	7,613.78	69,075.99	253,641.50
2001-02	37,374.48	144,034.49	8,390.84	75,101.55	264,901.36
2002-03	39,186.19	146,816.51	9,247.20	81,652.73	276,902.63
2003-04	41,085.72	149,652.26	10,190.97	88,775.37	289,704.32
2004-05	43,077.32	152,542.79	11,231.06	96,519.32	303,370.49
2005-06	45,165.47	155,489.15	12,377.29	104,938.78	317,970.70
2006-07	47,354.84	158,492.42	13,640.51	114,092.68	333,580.46
2007-08	49,650.34	161,553.70	15,032.66	124,045.09	350,281.78
2008-09	52,057.11	164,674.10	16,566.88	134,865.65	368,163.74
2009-10	54,580.54	167,854.78	18,257.69	146,630.10	387,323.11
2010-11	57,226.30	171,096.89	20,121.06	159,420.77	407,865.02
2011-12	60,000.32	174,401.62	22,174.61	173,327.18	429,903.73
2012-13	62,908.80	177,770.18	24,437.73	188,446.66	453,563.38
2013-14	65,958.26	181,203.81	26,931.84	204,885.03	478,978.94
2014-15	69,155.55	184,703.76	29,680.49	222,757.33	506,297.12
2015-16	72,507.82	188,271.30	32,709.66	242,188.65	535,677.44
2016-17	76,022.60	191,907.76	36,048.00	263,314.97	567,293.33
2017-18	79,707.75	195,614.45	39,727.04	286,284.17	601,333.40
2018-19	83,571.53	199,392.74	43,781.56	311,256.98	638,002.82
2019-20	87,622.61	203,244.01	48,249.88	338,408.20	677,524.70
2020-21	91,870.07	207,169.66	53,174.24	367,927.84	720,141.81

## Tertiary Sector Projections

Year	TSC	FRB	CSP	TRY
2000-01	157,576.58	75,800.93	87,037.95	320,415.47
2001-02	169,632.14	83,646.02	95,114.53	348,392.68
2002-03	182,610.01	92,303.04	103,940.57	378,853.61
2003-04	196,580.77	101,856.02	113,585.60	412,022.39
2004-05	211,620.37	112,397.70	124,125.64	448,143.71
2005-06	227,810.60	124,030.40	135,643.72	487,484.72
2006-07	245,239.48	136,867.04	148,230.61	530,337.13
2007-08	264,001.76	151,032.21	161,985.49	577,019.47
2008-09	284,199.48	166,663.43	177,016.73	627,879.64
2009-10	305,942.44	183,912.41	193,442.78	683,297.63
2010-11	329,348.87	202,946.59	211,393.06	743,688.52
2011-12	354,546.03	223,950.73	231,009.02	809,505.78
2012-13	381,670.93	247,128.71	252,445.22	881,244.85
2013-14	410,871.04	272,705.51	275,870.56	959,447.11
2014-15	442,305.14	300,929.41	301,469.62	1,044,704.17
2015-16	476,144.13	332,074.37	329,444.12	1,137,662.62
2016-17	512,572.00	366,442.70	360,014.48	1,239,029.19
2017-18	551,786.83	404,368.02	393,421.58	1,349,576.43
2018-19	594,001.83	446,218.45	429,928.64	1,470,148.92
2019-20	639,446.53	492,400.22	469,823.34	1,601,670.09
2020-21	688,368.02	543,361.63	513,420.01	1,745,149.65