Big Push Theory to Reduce Fiscal Deficit

Diptarghya Bhattacharjee
Msc (1st Year), Department Of Economics
University Of Calcutta, India

Abstract:- Fiscal deficit is very harmful for an economy, so government always tries to reduce the massive deficit and the one process is to earn high tax revenue and other process is to less expenditure but in developing or underdeveloped country, it is very tough to cut the expenditure but government can earn more tax revenue from industries if the industries can earn more profit. Here the big push model will be applied. This model asserts that the big push will be imposed in a country and the investment on modern sector will grow up and they will be profitable and government can earn more tax by increasing tax base not raising the tax rate and due to more modern sector the unemployment problem will be reduced and as a result the expenditure will be lowered and fiscal deficit will be reduced for long run and here I will consider three equilibria and one is bad, 2nd is good and last is very good and after modernising industries the equilibrium will shift consecutively and fiscal deficit will reduce.

Keywords:- Fiscal Deficit; Big Push; Tax Revenue; Modern Sector.

I. INTRODUCTION

Fiscal Deficit is a major concern in the world and it is defined as total expenditure exceeds total revenue in government budget. The safe limit of fiscal deficit is 5%. Generally, the sum of budgetary deficit together with government's market borrowings and liabilities undertaken is actually the fiscal deficit. (Gupta and Singh, 2016).

Therefore, Fiscal Deficit = Total Expenditure– Total Receipts other than borrowings

So, we can write this-
Fiscal Deficit = (Revenue Expenditure + Capital Expenditure) – (Revenue Receipts + Capital Receipts other than borrowings)

So, Fiscal Deficit = (Revenue Expenditure - Revenue Receipts) + Capital Expenditure - (Recoveries of loans + other Receipts)

The reason for massive fiscal deficit is excessive rise in govt expenditure in social sector and excess import expenditure rather than export but the revenue is not increasing through taxes or other sources. So, the deficit is continuously rising and it collapses the health of any economy.

Since the fiscal deficit affects the GDP of any country, so it affects the residents as well it affects per capita income, unemployment. Poverty etc. So, government should reduce the fiscal deficit as far as possible. Even though like inflation, fiscal deficit is hard to remove, so, it should be controlled by controlling the revenue and expenditure. Fiscal deficit is a type of cancer in an economy. If tax revenue and non- tax revenue will increase than government expenditure then fiscal deficit would lower.

Our primary motive is to reduce the fiscal deficit but this will be clarified by big push theory which was first given by Rosenstein-Rodan and this theory is applied here. Here, we will discuss three equilibria for three types of country- underdeveloped, developing, developed. The equilibria are known as bad, good, very good equilibrium.

II. REVIEW OF LITERATURE

Big push theory was given by Rosenstein-Rodan and it is basically the theory by which the industries will establish in any underdeveloped or developing countries. A big push of investment will be imposed on any country and as a result many modern industries will establish and the country will shift from bad to good equilibrium.

This model was more formalized by Kevin M. Murphy, Andrei Shleifer and Robert W. Vishny in their paper 'Industrialization and the Big Push' in 1989. The fiscal deficit is actually a type of deficit and it plays a crucial role to realize the condition of economy. Many rating agencies like Moody's, Fitch etc. have predicted the fiscal deficit of several countries.

III. METHODOLOGY

To analyze this model, the mathematical model is used and to test the validity of this model, I have used some secondary data which are collected from some newspapers, internet. To show the data, some bar diagram and line diagrams are depicted and also table is used to show the data.

IV. ANALYSIS

Before building up the model, I have assumed that the expenditure of government is constant and I will try to emphasize that how the revenue especially tax revenue would rise and the main focus is to raise the tax base rather than tax rate. If the tax revenue will rise more than expenditure, then fiscal deficit will be falling significantly than earlier.

Here, I have discussed for three cases. One case is bad equilibrium, 2nd case is good equilibrium and 3rd case is very good equilibrium. Our primary motive is to shift from bad to good equilibrium and then to very good equilibrium.

Here, we have considered three types of countries and first country is underdeveloped country, 2nd is developing and 3rd is developed country.

The underdeveloped countries have no modern type sector, there is only traditional sector that is labour is the primary means of production. Let's assume that labours are the entrepreneurs. Government has only source of income that is tax revenue but no non tax revenue. The population of those countries are quite high and there is massive unemployment. Let, the wage be considered as one. Here, we will consider the production function as-

$$Q = wL_i$$

but we assume that w=1 and that's why we can write that- $Q=L_i$ and we assume that there is the perfect competition and we know that P=MC in perfect competition and $MC = \frac{w}{MPL}$ and MPL = 1 and w=1, so, MC=1=P. So, P=1.

Now, profit will be-

$\pi = PQ - wL_i$

or, $\pi = PL_i - wL_i$

or, $\pi = (P-w)L_i$

If, P>w, then there will be supernormal profit and if P<w, then there will be the loss and P=w, then there will be the normal profit.

Since, P=w, so, profit is normal profit. So, if government will impose tax on these labours, then they will try to evade tax and government has no tax revenue but incurs some expenditures to subsidize or some allowances to the poor classes. So, government has high fiscal deficit. We have seen that several underdeveloped countries like Bangladesh, Pakistan, African countries incur high fiscal deficit.

Now, we will come to the 2nd equilibrium that is good equilibrium and here the country has both modern and traditional sector. Traditional sector has same characteristics like in underdeveloped countries.

But modern sector has been followed by increasing returns to scale and it is actually a monopolist and here we assume a fixed cost F to install the modern technology and we can convert then to one unit of labour α and α>1.

Now, the production function for i^{th} good will be-

$$Q_i = \alpha(L_i - F)$$

Now, the profit function will be-

$$\pi_M = P_i Q_i - Q_i/\alpha - F$$

$$\pi_M = Q_i (P_i - 1/\alpha) - F$$

We have assumed that there is the traditional sector which is same as traditional sector of underdeveloped countries. So, P=1 in traditional sector and if the modern sector wants to set high price then it can't charge the price greater than 1 because if they charge then traditional sector provides this commodity since modern sector is monopolist.

So,
$\pi_M = Q_i (1 - 1/\alpha) - F$ and since α>1 so, $1/\alpha < 1$ and $(1 - 1/\alpha)<1$ and it is basically a markup and denoted as 'a'.

Therefore, $\pi_M = aQ_i - F$

Now, we have assumed infinitely many goods and the consumers consume those goods and the goods are represented in real line that is (0,1) and each point represents the commodities consumed by consumers. So, here goods are continuous and follows Cobb-Douglas utility function.

$$U = \int_0^1 ln Ci \, dCi$$

The budget constraint will be-

$$\int_0^1 PiCi \, dCi = y$$

We know that the Cobb-Douglas utility function has same expenditure on all goods. So, PiCi=y.

Now, total income in the developing economy is-
$$Y = \Pi + L$$

Here, Π is income of profiters and L is the income of labours. From the utility function we get the expenditure function as a constant and we can write-

$y_1+y_2+\ldots\ldots+y_n=Y=Q$ or total income in an economy is same as total output.

So, $\pi_M = aY - F$ and $\Pi = n\pi_M$

Now, $Y = naY - nF + L$

or, $Y(1-an) = L - nF$

or, $Y = \frac{L - nF}{1 - an}$

So, we can easily get the profit level of modern sector.

$$\pi_M = aY - F$$

$$\text{or, } \pi_M = a \left(\frac{L - nF}{1 - an}\right) - F$$

$$\text{or, } \pi_M = \frac{aL - F}{1 - an}$$

So, we can say that profit will positive if aL>F and if government imposes tax then only the modern sector will pay the tax but traditional sector doesn't pay any tax and as a result government can reduce their fiscal deficit. But still now govt expenditure is positive due to help of traditional sector.

Now, we slightly change the modern sector wage rate and we add a term 'v' which is actually the wage premium and we can write- w= 1+v and then the profit function will be-

$$\pi_M = (1 - \frac{1+v}{\alpha})Y - (1+v) F$$

Here, $\left(\frac{1+v}{\alpha}\right)Y$ is a variable cost and $(1+v)F$ is a fixed cost term.

Now, Y= Π+L and Π=n π_M and we know that there are n modern sectors and (1-n) are traditional sectors and total labour is L.
Therefore, Y= $(1 - \frac{1+v}{\alpha})Y - (1+v)$ F $+(1-n)Y+ (1+v)(L-(1-n)Y)$

or, Y= bY – (1+v) F +(1-n)Y+ (1+v)(L-(1-n)Y) where b = $(1 - \frac{1+v}{\alpha})$ that is a markup.

Here, (1-n)Y is the amount of labour in traditional sector and (L-(1-n)Y) is the labour amount in modern sector.

Now, from this equation we can easily get the value of Y and Y= $\frac{(1+v)(L-nF)}{(1+v)-n(v+b)}$

And profit will be- $\pi_M(n) =$ $(1+v)\left[\frac{\{bL - F(1+v(1-n))\}}{(1+v)-n(v+b)}\right]$ and b<1 and n<1 but $\pi_M(n)$>0 that is all firms are modernized. So, we can see if we will give the wage premium 'v' in modern sector the profit will positive and we assume that all firms are modernized and government will earn more tax revenue in this case and as a result fiscal deficit can be reduced too much.

From these two cases (underdeveloped and developing), we can say that fiscal deficit can be reduced by government if there are many modern industries compare to traditional industry.

[The mathematical model of this first two cases (underdeveloped and developing) are taken from Kevin M. Murphy, Andrei Shleifer and Robert W. Vishny, Industrialization and the Big Push, Journal of political economy, The University of Chicago Press, 1989]

As an example, we can say that in case of India there is two types of sector one is traditional sector like agriculture, fisheries, mining etc. and other is modern like manufacturing, construction, IT sector etc. We have also seen that the fiscal deficit of India is 3% to 4% approx. It is less than underdeveloped countries.

Now, if we will transform to very good equilibrium then we have assumed that there are only modern industries and workers have been paid the higher wage that is wage premium and w=(1+v).

Now, the profit of modern sector will be-
$$\pi_M = (P - \frac{1+v}{\alpha})Y - (1+v)F$$

There are no traditional sectors, so price charged by the firm is P and it is the maximum price.

Now, Y= Π+L. Therefore, we can write Π= n π_M

Y=n $[(P - \frac{1+v}{\alpha})Y - (1+v)F] +(1+v)nL$ [since, there are no traditional sectors and n modern sectors and we assume that P>1]

or, Y= n[b'Y – (1+v)F] +(1+v)nL where b' = $(P - \frac{1+v}{\alpha})$ and b'>b since P>1]

or, Y= $\frac{[n(1+v)(L-F)]}{1-nb'}$ and we can easily get the profit of modern sector and it will be-

$$\pi_M(n) = \frac{(1+v)(nb' - F)}{1 - nb'}$$

If the number of modern sectors will increase then we observe that –

$\frac{d\pi(n)}{dn}$ >0 since b',v,n >0.

So, if the number of modern sectors will increase then profit will increase. So, automatically, they will pay tax and tax revenue will increase. So, fiscal deficit will decrease automatically. So, government can reduce fiscal deficit by establishing more modern sector compare to traditional sector because in modern sector the profiters as well as labours earn more than traditional sector. So, government earn more and fiscal deficit can be reduced.
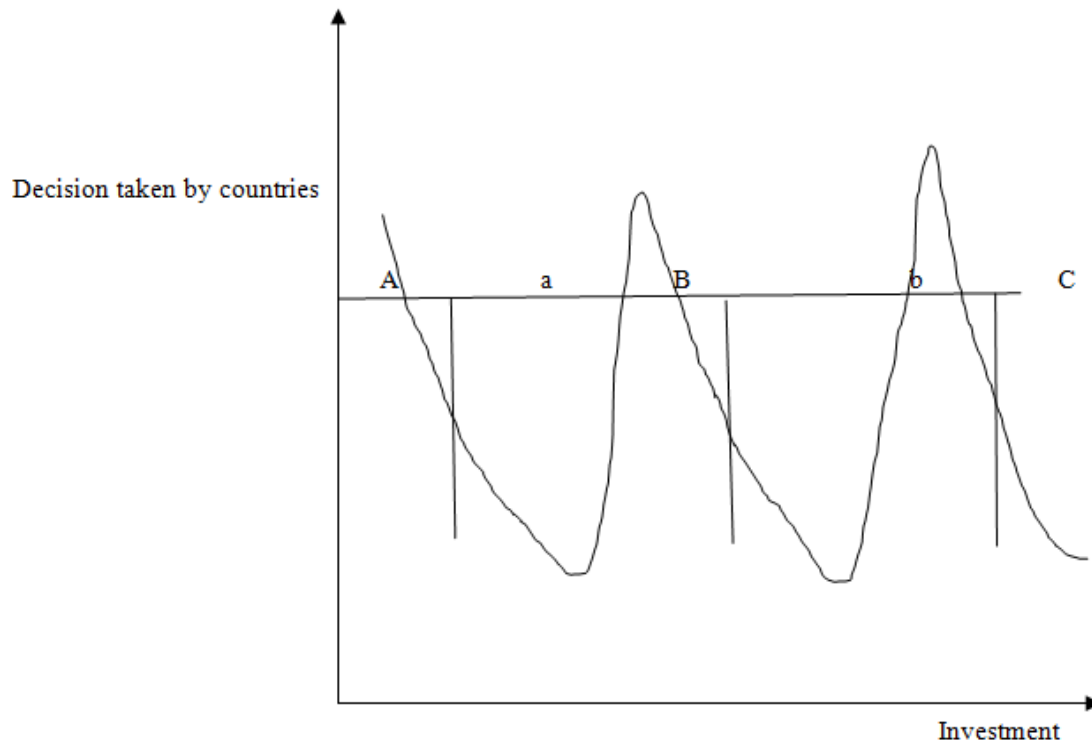
Fig 1:- Multiple equilibria of fiscal deficit

From this figure, we have seen that A is the bad equilibrium where the fiscal deficit is very high like underdeveloped countries and at point B the equilibrium is the good and here the fiscal deficit is moderate like developing countries and at point C the fiscal deficit is very low like developed countries and this is very good equilibrium.

Our primary motive is to shift from A to B to C. It is noted that we ignore the a,b,c points because at these points the economy has increasing cost or IRS assumption is not satisfied, so we ignore. The economy can shift from A to B but directly it can't shift because firstly the underdeveloped countries cannot invest too much in modern sector, so, the equilibrium shift in such a way that from A the economy will shift to a but since there is the DRS technology, so, a big push investment in modern sector is needed to shift the economy from a to B. Here the fiscal deficit is very much lower than A point. In this way, the economy will shift from B to b and then C where the fiscal deficit is under-control and it is very optimized for any country.

So, we can conclude that if a country adopts modern industry, it can reduce fiscal deficit significantly.

Now, what is the role of government to establish modern sector?

In developing or the under developed country the obstacle is co-ordination failure which averts to invest in modern sector. The other problem is expectation of investors and which is driven by history and for this type of countries like Bangladesh or African countries the expectation is very low and as a result the investors are not showing interests to invest in these countries. The other problem is coordination failure by which the complementarity does not take place. The complementarity is one economic agent takes an action induces to take this same action by other agents, so, if there is no coordination between the industries by forward or backward linkages. So, government can play a crucial role to establish a modern sector and government also can reduce the coordination failure and also raise the expectation of investors and due to the coordination, the complementarities take place and as a result many modern sectors will set up.

In case of India, we have seen that at the time of independence most of the sectors were traditional like food processing, textile etc. But after taking Mahalanobis model India built the heavy industries and reduce fiscal deficit significantly. Even though before taking economic reforms the deficit increased due to excessive restriction but after reforms the restrictions were reduced and as a result more industries and services built up and as a result the fiscal deficit reduced. But due to several reasons like recession, economic crisis, it can be risen but it will not sustain for long run. So, modern sector plays a crucial role for reducing fiscal deficit.

V. EMPERICAL TEST

Here, we will take three countries. For under developed country, we take the example of Bangladesh, where are very less amount of modern industries. Most of the industries are food processing or textiles which are mentioned above. As developing, we will take the example of India and as developed, we will take the example of USA.

❖ TEST FOR BANGLADESH:

Bangladesh is a predominantly agricultural-based economy and 80% approx. depend on this job and the population is huge and there is some agricultural-based economy like food processing, cotton and textile etc. The contribution of broad industry sector was 33.66% in FY 2017-18 according to BBS. In case of Bangladesh, in figure 2 at the next page and which is directly taken from the Financial Express newspaper and we have seen that the budget deficit is very high in 2007-08 FY due to US economic crisis but the rest of the periods the range of budget deficit was 4 to 5 % of GDP. In 2018-19 FY the budget deficit is above 5% and the reason is several issues like global turmoil. The main reason for the high budget deficit is revenue shortfall, was said by the experts. Since, Bangladesh is an agriculture-based economy, so, due to the nature issue or global turmoil, the agriculture is uncertain and that's why the revenue is being lowered and as a result the deficit is increasing. Further this country exports basically the agriculture-based goods and which have the inelastic demand in world market and that's why the price of export is automatically reduced and this incurs worsen terms of trade and as well as high current account deficit and from the basis of twin deficit (in appendix it is shown), we can conclude that this country has high fiscal deficit.
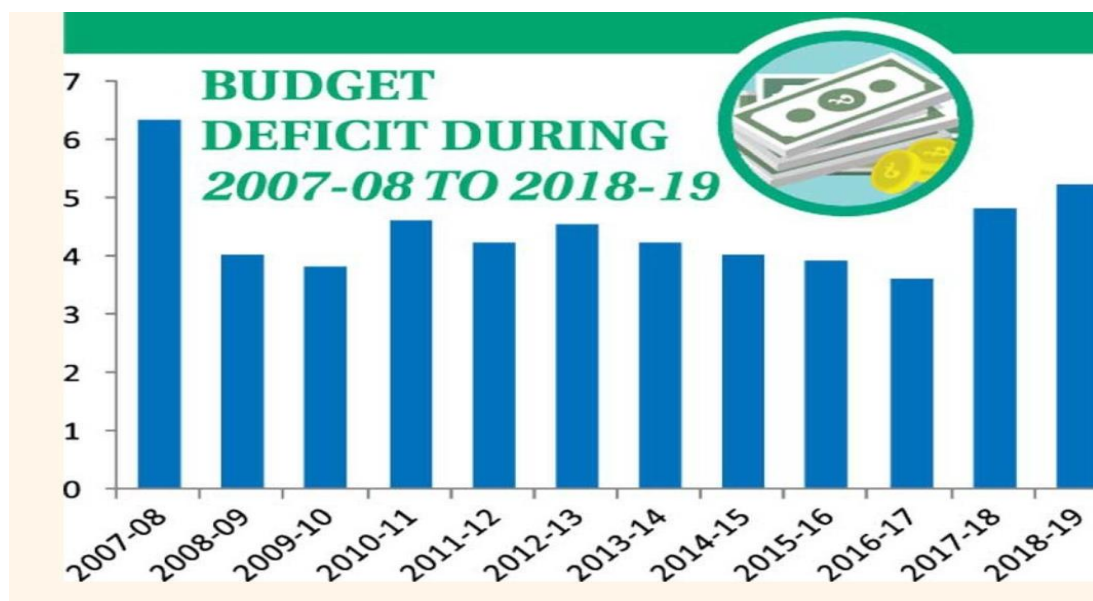

Fig 2:- Budget deficit of Bangladesh from 2007-08 to 2018-19 fiscal year
Source: The Financial Express, published on 3rd April, 2020

❖ TEST FOR INDIA

India is basically a dual economy. Here, we have seen from the one side the agricultural sector and from the other side we have seen the modern sector as well. Still now many people are working in agricultural sector. India's fiscal deficit is a biggest worry, it is now in 3 to 4% of GDP.

From the table-1, we have seen that the range of fiscal deficit from 1980 to 1991 or pre-reform was 5 to 8% which was very severe because the safe limit is 5% as per mentioned at introduction. But the deficit touched at 8% which was very risky for a county. The reason was mainly excessive restriction on industrial sector or modern sector.

The role of government should confine to build industries and services but not to interfere in case of production. But at this time government of India imposed restrictions on this sector. In 1991, there was the several reasons for high fiscal deficit. The first reason was Gulf war, the other reason was, taking huge loan from international private banks to produce several luxury goods like refrigerator, television, video, washing machine etc. in the early 1980's. (Dasgupta, 2005). But due to excessive restriction they were not profitable so much, and as a result the tax revenue was very low and inadequate so, the repayment was required in 1991 and that's why the fiscal deficit was widened.

Year	Fiscal deficit (% of GDP)
1980-81	5.55
1981-82	4.93
1982-83	5.4
1983-84	5.69
1984-85	6.79
1985-86	7.55
1986-87	8.13
1987-88	7.34
1988-89	7.08
1989-90	7.1
1990-91	7.61
1991-92	5.39
1992-93	5.19
1993-94	6.76
1994-95	5.52
1995-96	4.91
1996-97	4.7
1997-98	5.66
1998-99	6.29
1999-2000	5.18
2000-01	5.46
2001-02	5.98
2002-03	5.72
2003-04	4.34
2004-05	3.88
2005-06	3.96
Year	Fiscal deficit (% of GDP)
2006-07	3.32
2007-08	2.54
2008-09	5.99
2009-10	6.46
2010-11	4.79
2011-12	5.84
2012-13	4.91
2013-14	4.43
2014-15	4.09
2015-16	3.94

Table 1:- Fiscal deficit trend in several years in India
Source: Gupta and Singh, Fiscal deficit and its trends in India

In 1991, after reform the restrictions were reduced and from 1991 to 2000, the range was 4 to 6% which was lower than earlier but still it was not in a safe limit in many years. But, due to permit of foreign direct investment in some sectors and as a result modernisation increases and fiscal deficit reduced. But, one main point is in 2000, govt of India implemented FRBM act which can reduce fiscal deficit significantly and the target is to peg deficit in 3% of total GDP per annum and 'the Act aimed at reducing the gross fiscal deficit by 0.5% of GDP in each financial year beginning on April 1, 2000'. (Gupta and Singh, November, 2016). From 2004 to 2016 the fiscal deficit was being reduced significantly and sometimes it was fixed in 2% like in 2007-08 FY. Now, due to modernisation and more investments in service sector and IT sector also help to raise the tax base not tax rate and as a result fiscal deficit is falling but due to several reasons in India the fiscal deficit is rising recently because of recession, Corona issue etc. So, it is predicted that fiscal deficit may touches 6% due to shut down of the firms.
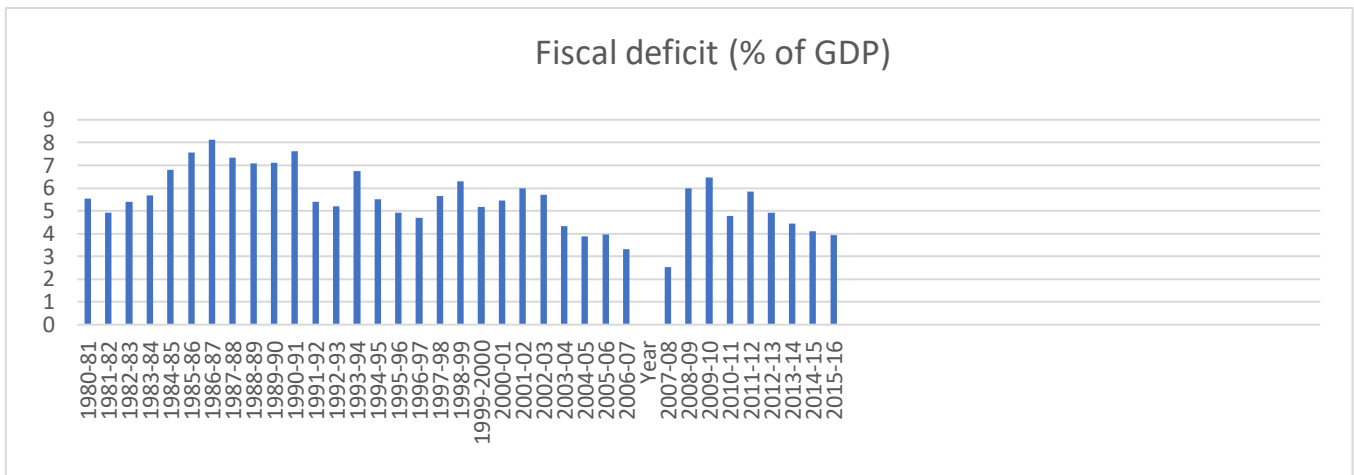
Fig 3:- Fiscal deficit of India in several times
Source: From the basis of the above table

Before independence or at the time of independent, India stayed at the bad equilibrium due to more traditional sector, but after big push by government reduced the fiscal deficit so much and the country shifted from bad to good equilibrium by establishing modern sector and services.

❖ **TEST FOR USA**

USA is a modernised country and most of the people work in industrial and service sector. The population is not huge like India or Bangladesh.

We have seen from the figure-4, the range of deficit from 1990 to 2018 was 0.3 to 3.8% of total GDP but in some years like in 2008-09 it touched 8 or 9% and the reason is the massive recession and as a result many firms were shut down at that moment and as a result the tax-cut was required and that's why the tax revenue was falling but due to more expenditure the deficit had been rising. But the range was in very safe limit and as a result, we can conclude that the equilibrium is a very good equilibrium or in figure 1 it is point 'C'.
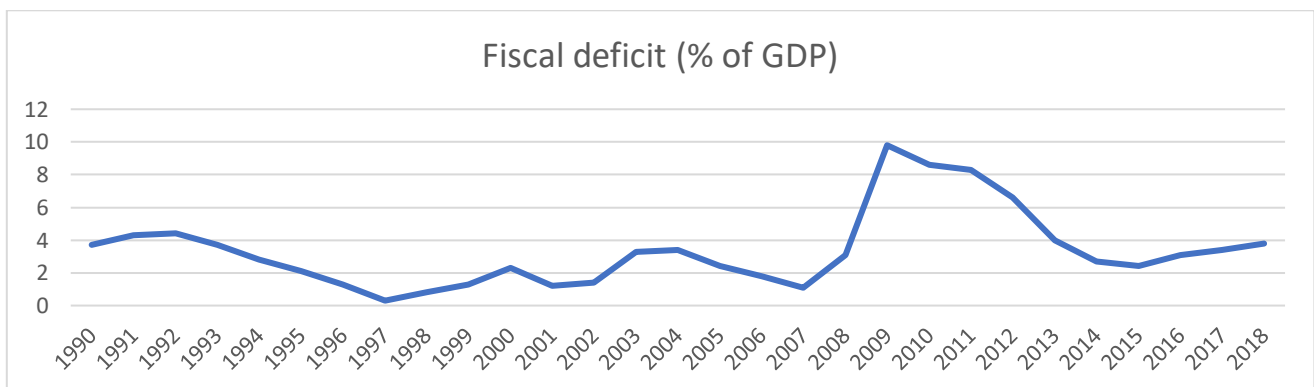

Fig 4:- Fiscal deficit trend in US from 1990-2018
Source: the balance, accessed on 5th April, 2020

So, it is clear that if a country builds more modern sector like heavy industries and services, then it helps to reduce the fiscal deficit more because due to establish of modern sector the tax revenue will increase and more people will get work and as a result total income of a country will rise and expenditure will fall. Even though to adopt the modern technology, the underdeveloped country requires some borrowings from internal and external market, which will raise the fiscal deficit but it will be valid for short time period. If the firms will earn more profit then the fiscal deficit will automatically reduce. So, the big push is required here to establish the modern sectors.

VI. CONCLUSION

The fiscal deficit doesn't mean that the country's economy is poor, sometimes due to fiscal deficit government creates money and as a result more works are generated and the economy becomes strong. But high fiscal deficit obviously is bad for any economy and consecutive fiscal deficit leads to create more fiscal deficit. So, government should always try to reduce the fiscal deficit. But, if government tries to establish more modern sectors rather than traditional sectors, it will basically help to reduce the fiscal deficit and also more people will get the job. Since, agriculture or traditional sectors are uncertain, so, government can't impose tax on this sector, so the deficit will be continuously rising but this doesn't happen in case of

modern sector, so, the fiscal deficit can be reduced significantly.

REFERENCES

[1]. Murphy, Kevin M. and Shleifer, Andrei. and Vishny, Robert W. (1989). *Industrialization and the Big Push*. Journal of political economy, The University of Chicago Press, 1989.

[2]. *The Financial Express*; published on 3rd April, 2020.

[3]. Gupta, S. and Singh, K. (2016). *Fiscal deficit and its trends in India*. International Journal of Business and Management Invention 2319 – 8028, (2016).

[4]. *The Balance*; accessed on 5th April, 2020, https://www.thebalance.com.

[5]. Dasgupta, Biplab. (2005). *Globalisation: India's Adjustment Experience*. Sage Publications, 2005

APPENDIX: Twin Deficit:

Twin deficit is actually the fiscal deficit accompanied with current account deficit. Due to rise in current account deficit that is total import-total export, government expenditure will be more on export sector like more export subsidy and that's why the fiscal deficit will rise. This is called twin deficit.

It can be shown mathematically.

Let our national income identity can be written as –

$Y= C+I+G+(X-M)$ ……(i)

Now, we can write (i) in other way-
$Y=C+S+T$ ….. (ii)   Where Y is output, C is consumption, I is investment, G is govt expenditure, (X-M) is net export S is savings and T is tax revenue of govt.

Now (i) and (ii) are equal and we can write-
$C+I+G+(X-M) = C+S+T$

Then we can write- $(I-S) + (G-T) = (M-X)$

Here (G-T) is actually the fiscal deficit that is govt expenditure is more than tax revenue and net export is also negative and it is known as twin deficit.