Unemployment

-Dammati Dheeraj

Dataset

World Development Indicators Dataset

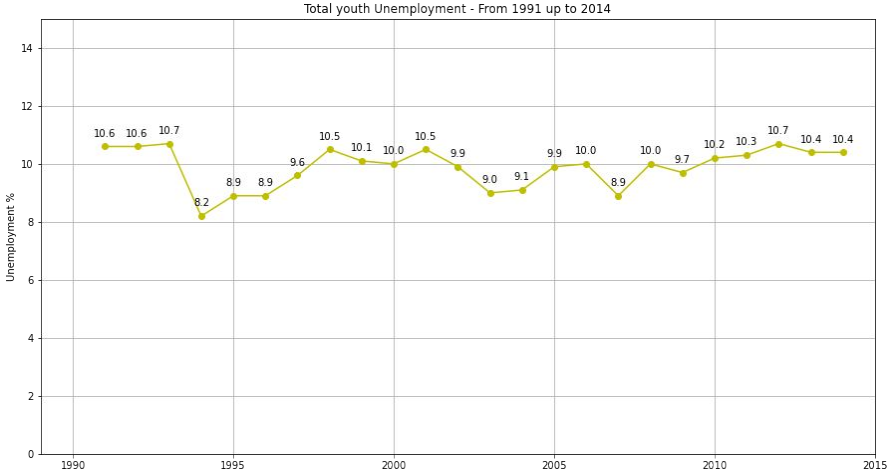
Motivation

As i live in india the main motivation is to go through the **unemployment change over time** in india because unemployment rate is a useful measure of the underutilisation of the labour supply and speaks to how well our economy is operating. Unemployment indicators on labour market are required for planning, policy and decision making at various levels, both within the government and outside.

Research Questions

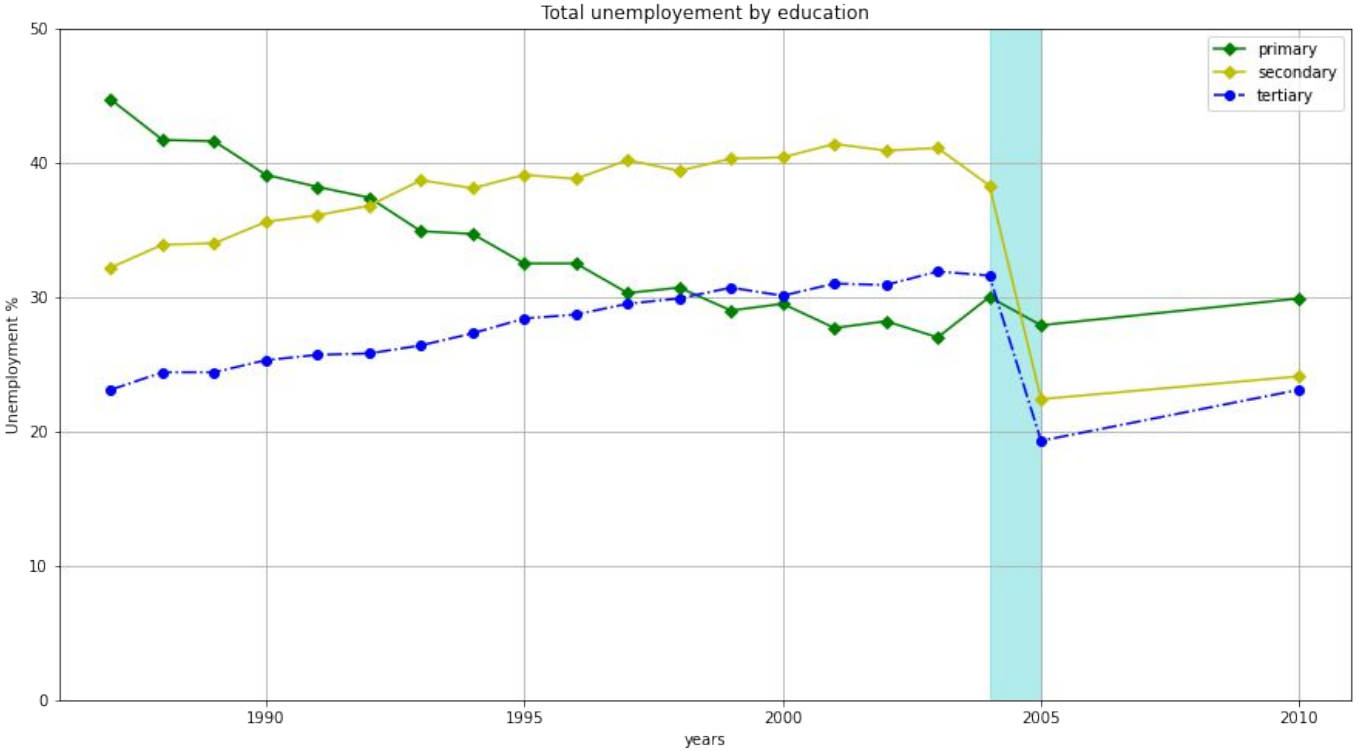
- How did unemployment change over time?
- India's unemployment w.r.t gender.
- India's unemployment as compared to china.
- correlation between GDP growth and unemployment rate.

Findings



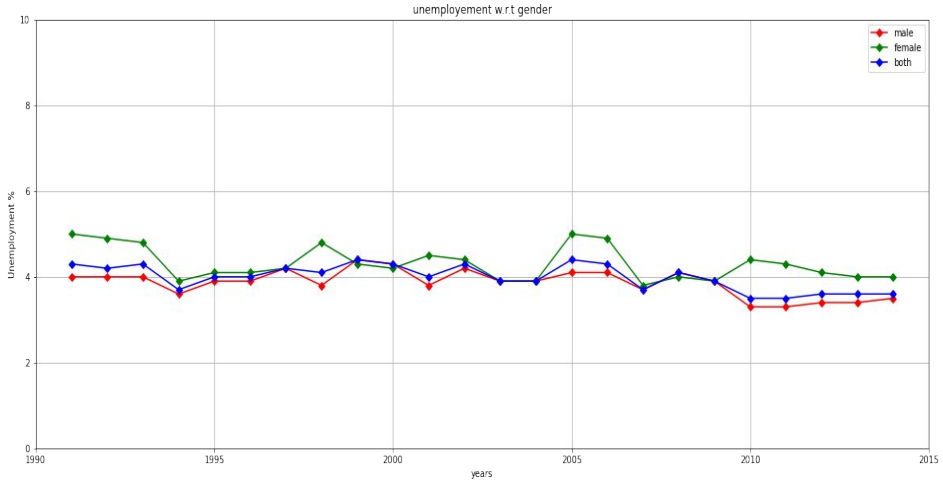
➔ As we can see that the total unemployment (%) is less than 5% which is good but the youth unemployment (%) is somewhat high when compared to total unemployment.

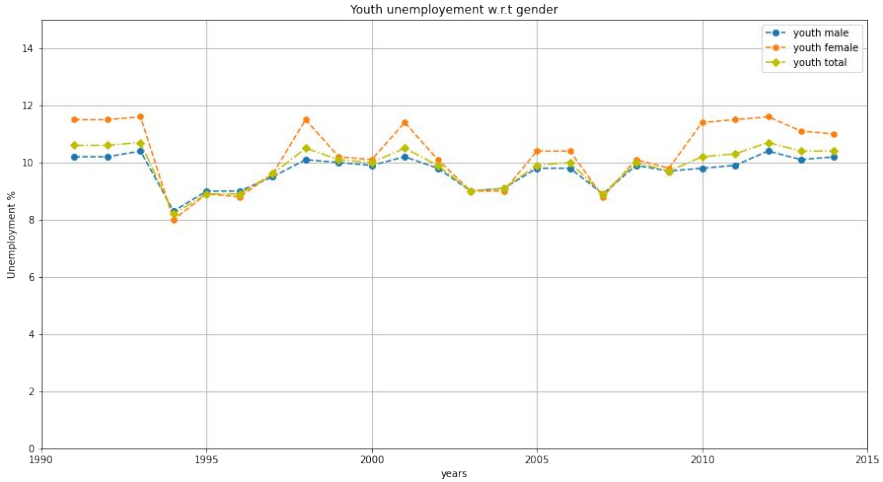
unemployment by education:

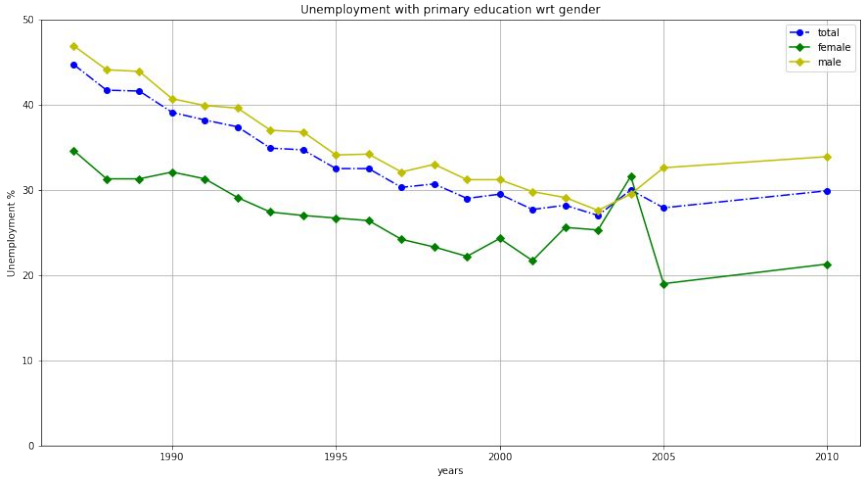


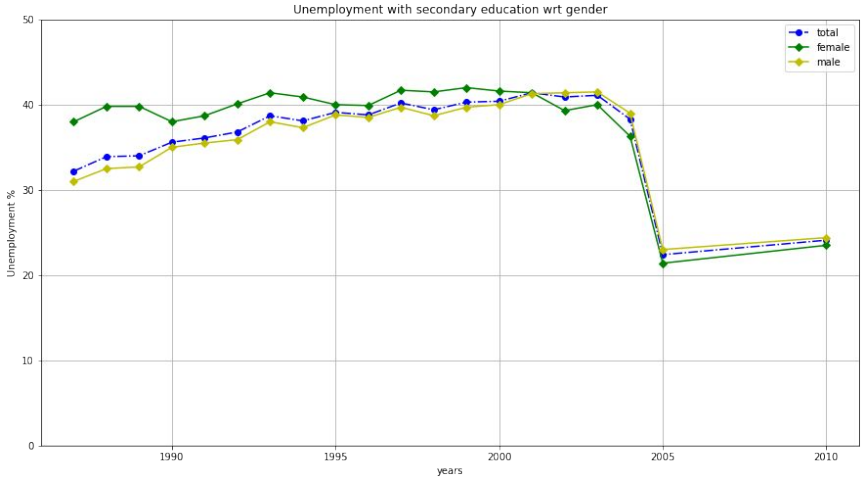
➔ From the above line plot we can see that there is a sudden drop in unemployment percentage in 2004-05.

Unemployment w.r.t gender



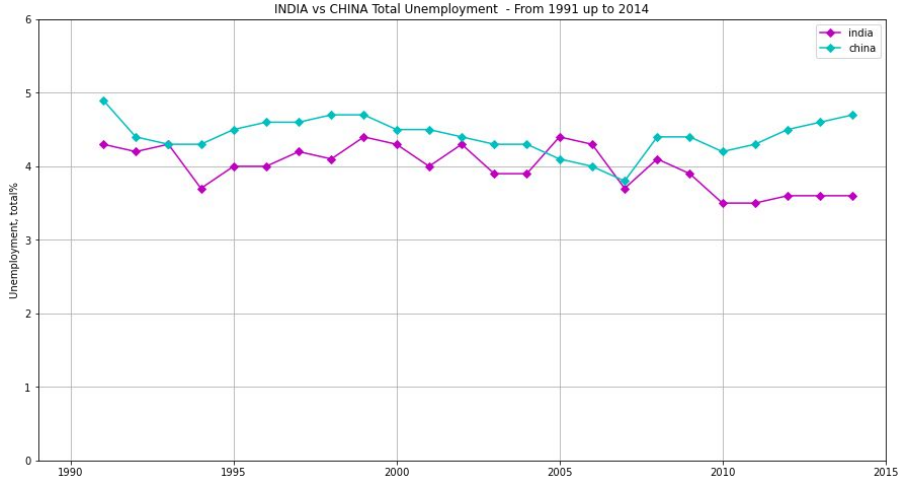


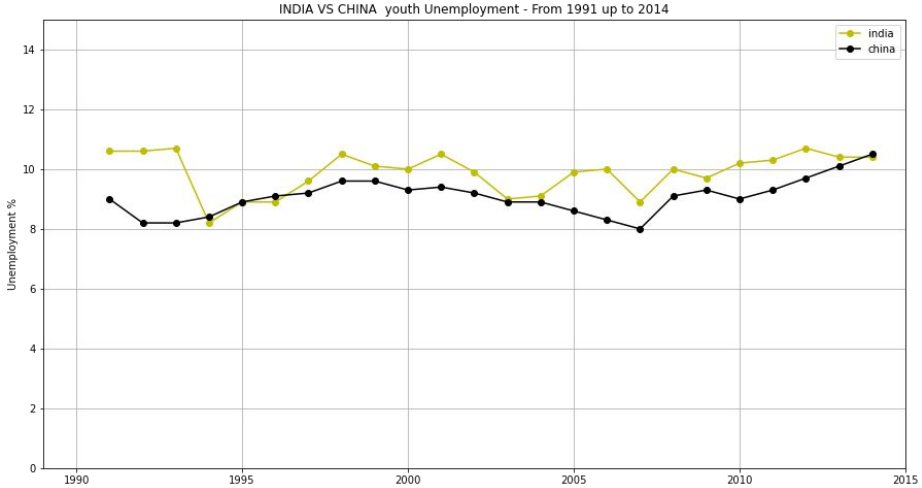




➔ We can see that female unemployment percent is high in almost every case but its low in case of unemployment with primary education when compared to male unemployment percent.

India's unemployment as compared to china





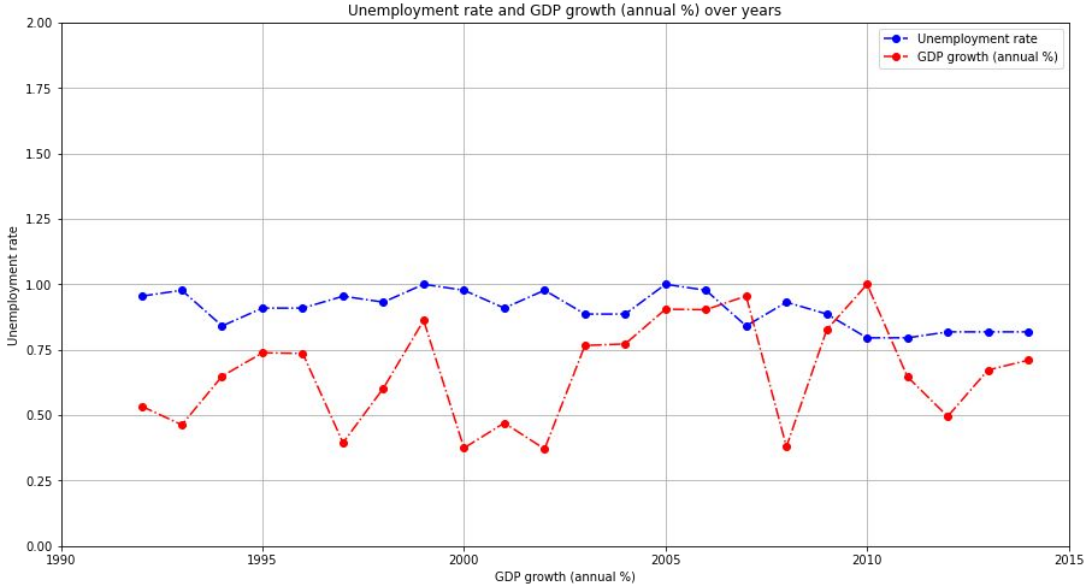
➔ India's total unemployment percent is low to some extent as compared to china but youth unemployment percent of china is low to some extent as compared to india.

correlation between GDP and unemployment rate.

	Unemploymentrate	GDP per capita growth
Unemploymentrate	1.000000	-0.288693
GDP per capita growth	-0.288693	1.000000

	Unemploymentrate	GDPgrowth
Unemploymentrate	1.000000	-0.296678
GDPgrowth	-0.296678	1.000000

- As we can see that correlation Coefficient is :
  - -0.288 in case of GDP per capita growth.
  - -0.296 in case of GDP growth.
- With the above correlation Coefficient values they are slightly inversely related but we cannot conclude since the values are not strong.



From the plot we cannot completely conclude any type correlation.

Acknowledgements

- I have no feedback on my work.

References

I mostly used the slides and notebooks that were given in this course for my analysis.

In [40]:
```
import pandas as pd
import numpy as np
import matplotlib.pyplot as plt
import random
```

In [41]:
```
indicators= pd.read_csv('./world-development-indicators/Indicators.csv')
```

In [42]:
```
count ='IND'
t1=indicators['CountryCode'].str.contains(count)
india=indicators[t1]
```

In [105…
```
india
```

Out[105…

	CountryName	CountryCode	IndicatorName	IndicatorCode	Year	Value
11561	India	IND	Adolescent fertility rate (births per 1,000 women ages 15-19)	SP.ADO.TFRT	1960	103.938000
11562	India	IND	Age dependency ratio (% of working-age population)	SP.POP.DPND	1960	76.559538
11563	India	IND	Age dependency ratio, old (% of working-age population)	SP.POP.DPND.OL	1960	5.403730
11564	India	IND	Age dependency ratio, young (% of working-age population)	SP.POP.DPND.YG	1960	71.155808
11565	India	IND	Agriculture, value added (% of GDP)	NV.AGR.TOTL.ZS	1960	42.561131
...	...	...	...	...	...	...
5648838	India	IND	Time required to register property (days)	IC.PRP.DURS	2015	47.000000
5648839	India	IND	Time required to start a business (days)	IC.REG.DURS	2015	29.000000
5648840	India	IND	Time to prepare and pay taxes (hours)	IC.TAX.DURS	2015	243.000000
5648841	India	IND	Time to resolve insolvency (years)	IC.ISV.DURS	2015	4.300000

	CountryName	CountryCode	IndicatorName	IndicatorCode	Year	Value
5648842	India	IND	Total tax rate (% of commercial profits)	IC.TAX.TOTL.CP.ZS	2015	60.600000

35721 rows × 6 columns

see what indicators about INDIA are available

In [106…
```
series= pd.read_csv('./world-development-indicators/Series.csv')
```

In [109…
```
print(series.shape)
series.head(1)
```

```
(1345, 20)
```

Out[109…

	SeriesCode	Topic	IndicatorName	ShortDefinition	LongDefinition	UnitOfMeasure
0	BN.KLT.DINV.CD	Economic Policy & Debt: Balance of payments: Capital & financial account	Foreign direct investment, net (BoP, current US$)	NaN	Foreign direct investment are the net inflows of investment to acquire a lasting management interest (10 percent or more of voting stock) in an enterprise operating in an economy other than that of the investor. It is the sum of equity capital, reinvestment of earnings, other long-term capital, and short-term capital as shown in the balance of payments. This series shows total net FDI. In BPM6, financial account balances are calculated as the change in assets minus the change in liabilities. Net FDI outflows are assets and net FDI inflows are liabilities. Data are in current U.S. dollars.	NaN

In [108…

```
series['Topic'].unique().tolist()
```

Out[108…

```
['Economic Policy & Debt: Balance of payments: Capital & financial account',
 'Economic Policy & Debt: Balance of payments: Current account: Balances',
 'Economic Policy & Debt: Balance of payments: Current account: Goods, service
s & income',
 'Economic Policy & Debt: Balance of payments: Current account: Transfers',
 'Economic Policy & Debt: Balance of payments: Reserves & other items',
 'Economic Policy & Debt: External debt: Amortization',
 'Economic Policy & Debt: External debt: Arrears, reschedulings, etc.',
 'Economic Policy & Debt: External debt: Commitments',
 'Economic Policy & Debt: External debt: Currency composition',
 'Economic Policy & Debt: External debt: Debt outstanding',
 'Economic Policy & Debt: External debt: Debt ratios & other items',
 'Economic Policy & Debt: External debt: Debt service',
 'Economic Policy & Debt: External debt: Disbursements',
 'Economic Policy & Debt: External debt: Interest',
 'Economic Policy & Debt: External debt: Net flows',
 'Economic Policy & Debt: External debt: Net transfers',
 'Economic Policy & Debt: External debt: Terms',
 'Economic Policy & Debt: External debt: Undisbursed debt',
 'Economic Policy & Debt: National accounts: Adjusted savings & income',
 'Economic Policy & Debt: National accounts: Atlas GNI & GNI per capita',
 'Economic Policy & Debt: National accounts: Growth rates',
 'Economic Policy & Debt: National accounts: Growth rates:',
 'Economic Policy & Debt: National accounts: Local currency at constant price
s: Aggregate indicators',
 'Economic Policy & Debt: National accounts: Local currency at constant price
s: Expenditure on GDP',
 'Economic Policy & Debt: National accounts: Local currency at constant price
s: Other items',
 'Economic Policy & Debt: National accounts: Local currency at constant price
s: Value added',
 'Economic Policy & Debt: National accounts: Local currency at current prices:
Aggregate indicators',
 'Economic Policy & Debt: National accounts: Local currency at current prices:
Expenditure on GDP',
 'Economic Policy & Debt: National accounts: Local currency at current prices:
Value added',
 'Economic Policy & Debt: National accounts: Shares of GDP & other',
 'Economic Policy & Debt: National accounts: US$ at constant 2005 prices: Aggr
egate indicators',
 'Economic Policy & Debt: National accounts: US$ at constant 2005 prices: Expe
nditure on GDP',
 'Economic Policy & Debt: National accounts: US$ at constant 2005 prices: Valu
e added',
 'Economic Policy & Debt: National accounts: US$ at current prices: Aggregate
indicators',
 'Economic Policy & Debt: National accounts: US$ at current prices: Expenditur
e on GDP',
 'Economic Policy & Debt: National accounts: US$ at current prices: Other item
s',
 'Economic Policy & Debt: National accounts: US$ at current prices: Value adde
d',
 'Economic Policy & Debt: Official development assistance',
 'Economic Policy & Debt: Purchasing power parity',
 'Education: Efficiency',
 'Education: Inputs',
 'Education: Outcomes',
 'Education: Participation',
 'Environment: Agricultural production',
 'Environment: Biodiversity & protected areas',
 'Environment: Density & urbanization',
 'Environment: Emissions',
 'Environment: Energy production & use',
 'Environment: Freshwater',
 'Environment: Land use',
```

```
'Environment: Natural resources contribution to GDP',
'Financial Sector: Access',
'Financial Sector: Assets',
'Financial Sector: Capital markets',
'Financial Sector: Exchange rates & prices',
'Financial Sector: Interest rates',
'Financial Sector: Monetary holdings (liabilities)',
'Health: Disease prevention',
'Health: Health services',
'Health: Mortality',
'Health: Nutrition',
'Health: Population: Dynamics',
'Health: Population: Structure',
'Health: Reproductive health',
'Health: Risk factors',
'Infrastructure: Communications',
'Infrastructure: Technology',
'Infrastructure: Transportation',
'Poverty: Income distribution',
'Poverty: Poverty rates',
'Poverty: Shared prosperity',
'Private Sector & Trade: Business environment',
'Private Sector & Trade: Exports',
'Private Sector & Trade: Imports',
'Private Sector & Trade: Private infrastructure investment',
'Private Sector & Trade: Tariffs',
'Private Sector & Trade: Total merchandise trade',
'Private Sector & Trade: Trade facilitation',
'Private Sector & Trade: Trade indexes',
'Private Sector & Trade: Travel & tourism',
'Public Sector: Conflict & fragility',
'Public Sector: Defense & arms trade',
'Public Sector: Government finance: Deficit & financing',
'Public Sector: Government finance: Expense',
'Public Sector: Government finance: Revenue',
'Public Sector: Policy & institutions',
'Social Protection & Labor: Economic activity',
'Social Protection & Labor: Labor force structure',
'Social Protection & Labor: Migration',
'Social Protection & Labor: Performance',
'Social Protection & Labor: Unemployment']
```

In [47]:

```
se2= 'Unemployment'
pd.set_option('display.max_colwidth', None)
s2=series['Topic'].str.contains(se2)
series[s2].loc[:,['SeriesCode','IndicatorName']]
```

Out[47]:

	SeriesCode	IndicatorName
1318	SL.UEM.LTRM.ZS	Long-term unemployment (% of total unemployment)
1319	SL.UEM.LTRM.FE.ZS	Long-term unemployment, female (% of female unemployment)
1320	SL.UEM.LTRM.MA.ZS	Long-term unemployment, male (% of male unemployment)
1321	SL.UEM.NEET.FE.ZS	Share of youth not in education, employment or training, female (% of female youth population)
1322	SL.UEM.NEET.MA.ZS	Share of youth not in education, employment or training, male (% of male youth population)
1323	SL.UEM.NEET.ZS	Share of youth not in education, employment or training, total (% of youth population)
1324	SL.UEM.PRIM.ZS	Unemployment with primary education (% of total unemployment)
1325	SL.UEM.PRIM.FE.ZS	Unemployment with primary education, female (% of female unemployment)

	SeriesCode	IndicatorName
1326	SL.UEM.PRIM.MA.ZS	Unemployment with primary education, male (% of male unemployment)
1327	SL.UEM.SECO.ZS	Unemployment with secondary education (% of total unemployment)
1328	SL.UEM.SECO.FE.ZS	Unemployment with secondary education, female (% of female unemployment)
1329	SL.UEM.SECO.MA.ZS	Unemployment with secondary education, male (% of male unemployment)
1330	SL.UEM.TERT.ZS	Unemployment with tertiary education (% of total unemployment)
1331	SL.UEM.TERT.FE.ZS	Unemployment with tertiary education, female (% of female unemployment)
1332	SL.UEM.TERT.MA.ZS	Unemployment with tertiary education, male (% of male unemployment)
1333	SL.UEM.TOTL.FE.ZS	Unemployment, female (% of female labor force) (modeled ILO estimate)
1334	SL.UEM.TOTL.FE.NE.ZS	Unemployment, female (% of female labor force) (national estimate)
1335	SL.UEM.TOTL.MA.ZS	Unemployment, male (% of male labor force) (modeled ILO estimate)
1336	SL.UEM.TOTL.MA.NE.ZS	Unemployment, male (% of male labor force) (national estimate)
1337	SL.UEM.TOTL.ZS	Unemployment, total (% of total labor force) (modeled ILO estimate)
1338	SL.UEM.TOTL.NE.ZS	Unemployment, total (% of total labor force) (national estimate)
1339	SL.UEM.1524.FE.ZS	Unemployment, youth female (% of female labor force ages 15-24) (modeled ILO estimate)
1340	SL.UEM.1524.FE.NE.ZS	Unemployment, youth female (% of female labor force ages 15-24) (national estimate)
1341	SL.UEM.1524.MA.ZS	Unemployment, youth male (% of male labor force ages 15-24) (modeled ILO estimate)
1342	SL.UEM.1524.MA.NE.ZS	Unemployment, youth male (% of male labor force ages 15-24) (national estimate)
1343	SL.UEM.1524.ZS	Unemployment, youth total (% of total labor force ages 15-24) (modeled ILO estimate)
1344	SL.UEM.1524.NE.ZS	Unemployment, youth total (% of total labor force ages 15-24) (national estimate)

there are two types of estimates for same indicator type

1. modeled ILO estimate
2. national estimate

In [48]:
```
st2='Unemployment, total'
sq2=series['IndicatorName'].str.contains(st2)
ut=series[sq2].loc[:,['SeriesCode','IndicatorName']]
pd.set_option('display.max_colwidth', None)
ut
```

Out[48]:

	SeriesCode	IndicatorName
1337	SL.UEM.TOTL.ZS	Unemployment, total (% of total labor force) (modeled ILO estimate)

	SeriesCode	IndicatorName
1338	SL.UEM.TOTL.NE.ZS	Unemployment, total (% of total labor force) (national estimate)

In [49]:
```
u_ilo_code = 'SL.UEM.TOTL.ZS'
u_ne_code = 'SL.UEM.TOTL.NE.ZS'
u_ilo1= india['IndicatorCode'].str.contains(u_ilo_code)
u_ne1=india['IndicatorCode'].str.contains(u_ne_code)
iv1= india[u_ilo1]
nv1= india[u_ne1]
year=india['Year'].values
```

In [50]:
```
print('national estimate:','min-',min(nv1['Year']),'max-',max(nv1['Year']))
print('modeled ILO estimate:','min-',min(iv1['Year']),'max-',max(iv1['Year']))
```

```
national estimate: min- 1994 max- 2014
modeled ILO estimate: min- 1991 max- 2014
```

using modeled ILO estimate for further Analysis

In [51]:
```
# we will be using modeled ILO estimate
iv1[['Year','Value']]
```

Out[51]:

	Year	Value
2055401	1991	4.3
2173543	1992	4.2
2296508	1993	4.3
2421305	1994	3.7
2551186	1995	4.0
2686192	1996	4.0
2821650	1997	4.2
2958605	1998	4.1
3097952	1999	4.4
3246342	2000	4.3
3398655	2001	4.0
3551256	2002	4.3
3705495	2003	3.9
3860887	2004	3.9
4030467	2005	4.4
4208965	2006	4.3
4387804	2007	3.7
4568141	2008	4.1
4747269	2009	3.9
4930118	2010	3.5
5111870	2011	3.5

	Year	Value
5287541	2012	3.6
5453666	2013	3.6
5585790	2014	3.6

plotting total unemployment - From 1991 up to 2014

In [52]:

```
plt.figure(figsize=(15,8))
plt.plot(iv1['Year'].values,iv1['Value'].values,'-gD')
#plt.plot(nv1['Year'].values,nv1['Value'].values,'-bD')
plt.axis([1989, 2015,0,6])

for x,y in zip(iv1['Year'].values,iv1['Value'].values):
    label = "{:.2f}".format(y)
    plt.annotate(label,(x,y),textcoords="offset points",xytext=(0,10),ha='cen

plt.grid(True)
plt.ylabel('Unemployment, total%')
plt.xlabel('years')
plt.title('Total Unemployment - From 1991 up to 2014')
```

Out[52]: Text(0.5, 1.0, 'Total Unemployment - From 1991 up to 2014')

In [53]:

```
count ='CHN'
t1=indicators['CountryCode'].str.contains(count)
china=indicators[t1]
china
```

Out[53]:

	CountryName	CountryCode	IndicatorName	IndicatorCode	Year	Value
7144	China	CHN	Adolescent fertility rate (births per 1,000 women ages 15-19)	SP.ADO.TFRT	1960	68.033200

	CountryName	CountryCode	IndicatorName	IndicatorCode	Year	Value
7145	China	CHN	Age dependency ratio (% of working-age population)	SP.POP.DPND	1960	77.322072
7146	China	CHN	Age dependency ratio, old (% of working-age population)	SP.POP.DPND.OL	1960	6.472535
7147	China	CHN	Age dependency ratio, young (% of working-age population)	SP.POP.DPND.YG	1960	70.849537
7148	China	CHN	Agriculture, value added (% of GDP)	NV.AGR.TOTL.ZS	1960	23.383665
...	...	...	...	...	...	...
5646051	China	CHN	Time required to register property (days)	IC.PRP.DURS	2015	19.500000
5646052	China	CHN	Time required to start a business (days)	IC.REG.DURS	2015	31.400000
5646053	China	CHN	Time to prepare and pay taxes (hours)	IC.TAX.DURS	2015	261.000000
5646054	China	CHN	Time to resolve insolvency (years)	IC.ISV.DURS	2015	1.700000
5646055	China	CHN	Total tax rate (% of commercial profits)	IC.TAX.TOTL.CP.ZS	2015	67.800000

29678 rows × 6 columns

In [54]:

```
u_ilo_code = 'SL.UEM.TOTL.ZS'
china_u_ilo1= china['IndicatorCode'].str.contains(u_ilo_code)
tue_china=china[china_u_ilo1]
tue_china
```

Out[54]:

	CountryName	CountryCode	IndicatorName	IndicatorCode	Year	Value
2032409	China	CHN	Unemployment, total (% of total labor force)	SL.UEM.TOTL.ZS	1991	4.9
2149423	China	CHN	Unemployment, total (% of total labor force)	SL.UEM.TOTL.ZS	1992	4.4
2271883	China	CHN	Unemployment, total (% of total labor force)	SL.UEM.TOTL.ZS	1993	4.3

	CountryName	CountryCode	IndicatorName	IndicatorCode	Year	Value
2396156	China	CHN	Unemployment, total (% of total labor force)	SL.UEM.TOTL.ZS	1994	4.3
2524138	China	CHN	Unemployment, total (% of total labor force)	SL.UEM.TOTL.ZS	1995	4.5
2659132	China	CHN	Unemployment, total (% of total labor force)	SL.UEM.TOTL.ZS	1996	4.6
2794736	China	CHN	Unemployment, total (% of total labor force)	SL.UEM.TOTL.ZS	1997	4.6
2931412	China	CHN	Unemployment, total (% of total labor force)	SL.UEM.TOTL.ZS	1998	4.7
3069648	China	CHN	Unemployment, total (% of total labor force)	SL.UEM.TOTL.ZS	1999	4.7
3215937	China	CHN	Unemployment, total (% of total labor force)	SL.UEM.TOTL.ZS	2000	4.5
3369187	China	CHN	Unemployment, total (% of total labor force)	SL.UEM.TOTL.ZS	2001	4.5
3520663	China	CHN	Unemployment, total (% of total labor force)	SL.UEM.TOTL.ZS	2002	4.4
3675587	China	CHN	Unemployment, total (% of total labor force)	SL.UEM.TOTL.ZS	2003	4.3
3829874	China	CHN	Unemployment, total (% of total labor force)	SL.UEM.TOTL.ZS	2004	4.3
3994984	China	CHN	Unemployment, total (% of total labor force)	SL.UEM.TOTL.ZS	2005	4.1
4174750	China	CHN	Unemployment, total (% of total labor force)	SL.UEM.TOTL.ZS	2006	4.0
4352955	China	CHN	Unemployment, total (% of total labor force)	SL.UEM.TOTL.ZS	2007	3.8
4533398	China	CHN	Unemployment, total (% of total labor force)	SL.UEM.TOTL.ZS	2008	4.4
4712925	China	CHN	Unemployment, total (% of total labor force)	SL.UEM.TOTL.ZS	2009	4.4
4894194	China	CHN	Unemployment, total (% of total labor force)	SL.UEM.TOTL.ZS	2010	4.2

	CountryName	CountryCode	IndicatorName	IndicatorCode	Year	Value
5077722	China	CHN	Unemployment, total (% of total labor force)	SL.UEM.TOTL.ZS	2011	4.3
5253449	China	CHN	Unemployment, total (% of total labor force)	SL.UEM.TOTL.ZS	2012	4.5
5423498	China	CHN	Unemployment, total (% of total labor force)	SL.UEM.TOTL.ZS	2013	4.6
5564809	China	CHN	Unemployment, total (% of total labor force)	SL.UEM.TOTL.ZS	2014	4.7

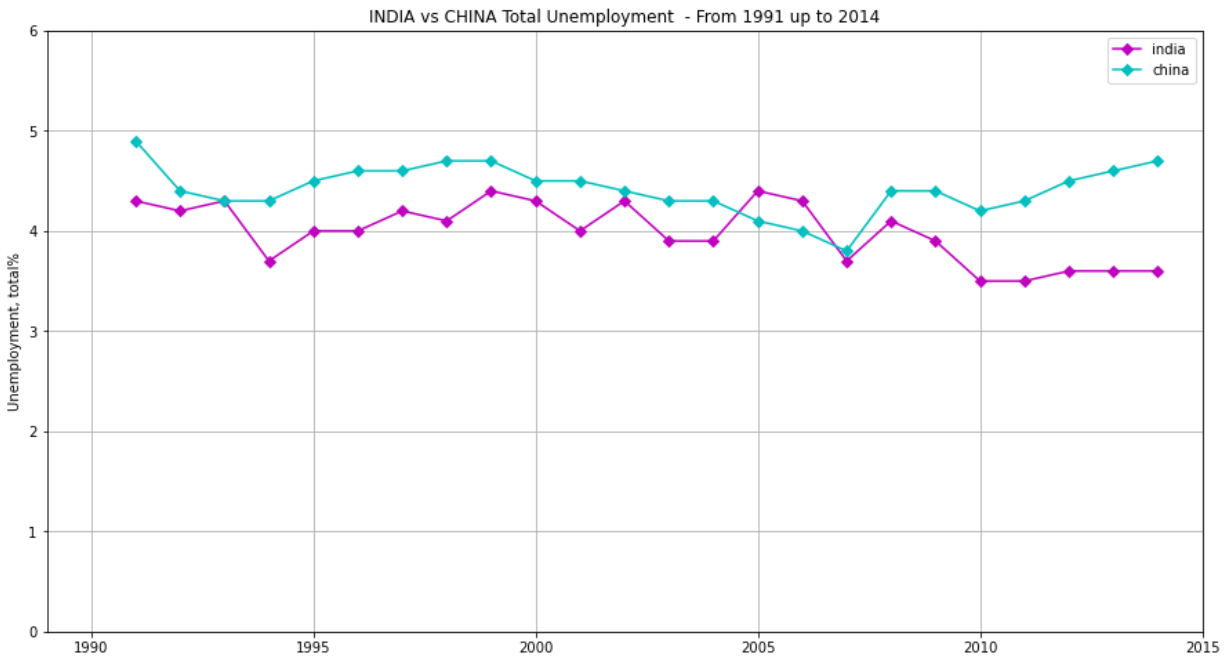
plotting INDIA vs CHINA Total Unemployment - From 1991 up to 2014

In [55]:

```
plt.figure(figsize=(15,8))
plt.plot(iv1['Year'].values,iv1['Value'].values,'-mD',label='india')
plt.plot(tue_china['Year'].values,tue_china['Value'].values,'-cD',label='chin
#plt.plot(nv1['Year'].values,nv1['Value'].values,'-bD')
plt.axis([1989, 2015,0,6])
plt.legend()
plt.grid(True)
plt.ylabel('Unemployment, total%')
plt.title('INDIA vs CHINA Total Unemployment  - From 1991 up to 2014')
```

Out[55]:

```
Text(0.5, 1.0, 'INDIA vs CHINA Total Unemployment  - From 1991 up to 2014')
```



In [56]:

```
youth_t_code='SL.UEM.1524.ZS'
youth=india['IndicatorCode'].str.contains(youth_t_code)
china_youth=china['IndicatorCode'].str.contains(youth_t_code)
chinayouthdata=china[china_youth]
youthdata=india[youth]
youthdata[['Year','Value']]
```

Out[56]:

	Year	Value

	Year	Value
2055404	1991	10.6
2173546	1992	10.6
2296511	1993	10.7
2421311	1994	8.2
2551190	1995	8.9
2686196	1996	8.9
2821654	1997	9.6
2958609	1998	10.5
3097955	1999	10.1
3246348	2000	10.0
3398658	2001	10.5
3551259	2002	9.9
3705498	2003	9.0
3860890	2004	9.1
4030473	2005	9.9
4208968	2006	10.0
4387807	2007	8.9
4568144	2008	10.0
4747272	2009	9.7
4930124	2010	10.2
5111873	2011	10.3
5287547	2012	10.7
5453670	2013	10.4
5585794	2014	10.4

In [57]:
```
chinayouthdata
```

Out[57]:

	CountryName	CountryCode	IndicatorName	IndicatorCode	Year	Value
2032413	China	CHN	Unemployment, youth total (% of total labor force ages 15-24) (modeled ILO estimate)	SL.UEM.1524.ZS	1991	9.0
2149427	China	CHN	Unemployment, youth total (% of total labor force ages 15-24) (modeled ILO estimate)	SL.UEM.1524.ZS	1992	8.2
2271887	China	CHN	Unemployment, youth total (% of total labor force ages 15-24) (modeled ILO estimate)	SL.UEM.1524.ZS	1993	8.2

	CountryName	CountryCode	IndicatorName	IndicatorCode	Year	Value
2396160	China	CHN	Unemployment, youth total (% of total labor force ages 15-24) (modeled ILO estimate)	SL.UEM.1524.ZS	1994	8.4
2524142	China	CHN	Unemployment, youth total (% of total labor force ages 15-24) (modeled ILO estimate)	SL.UEM.1524.ZS	1995	8.9
2659136	China	CHN	Unemployment, youth total (% of total labor force ages 15-24) (modeled ILO estimate)	SL.UEM.1524.ZS	1996	9.1
2794740	China	CHN	Unemployment, youth total (% of total labor force ages 15-24) (modeled ILO estimate)	SL.UEM.1524.ZS	1997	9.2
2931416	China	CHN	Unemployment, youth total (% of total labor force ages 15-24) (modeled ILO estimate)	SL.UEM.1524.ZS	1998	9.6
3069652	China	CHN	Unemployment, youth total (% of total labor force ages 15-24) (modeled ILO estimate)	SL.UEM.1524.ZS	1999	9.6
3215941	China	CHN	Unemployment, youth total (% of total labor force ages 15-24) (modeled ILO estimate)	SL.UEM.1524.ZS	2000	9.3
3369191	China	CHN	Unemployment, youth total (% of total labor force ages 15-24) (modeled ILO estimate)	SL.UEM.1524.ZS	2001	9.4
3520667	China	CHN	Unemployment, youth total (% of total labor force ages 15-24) (modeled ILO estimate)	SL.UEM.1524.ZS	2002	9.2
3675591	China	CHN	Unemployment, youth total (% of total labor force ages 15-24) (modeled ILO estimate)	SL.UEM.1524.ZS	2003	8.9
3829878	China	CHN	Unemployment, youth total (% of total labor force ages 15-24) (modeled ILO estimate)	SL.UEM.1524.ZS	2004	8.9

	CountryName	CountryCode	IndicatorName	IndicatorCode	Year	Value
3994988	China	CHN	Unemployment, youth total (% of total labor force ages 15-24) (modeled ILO estimate)	SL.UEM.1524.ZS	2005	8.6
4174754	China	CHN	Unemployment, youth total (% of total labor force ages 15-24) (modeled ILO estimate)	SL.UEM.1524.ZS	2006	8.3
4352959	China	CHN	Unemployment, youth total (% of total labor force ages 15-24) (modeled ILO estimate)	SL.UEM.1524.ZS	2007	8.0
4533402	China	CHN	Unemployment, youth total (% of total labor force ages 15-24) (modeled ILO estimate)	SL.UEM.1524.ZS	2008	9.1
4712929	China	CHN	Unemployment, youth total (% of total labor force ages 15-24) (modeled ILO estimate)	SL.UEM.1524.ZS	2009	9.3
4894198	China	CHN	Unemployment, youth total (% of total labor force ages 15-24) (modeled ILO estimate)	SL.UEM.1524.ZS	2010	9.0
5077726	China	CHN	Unemployment, youth total (% of total labor force ages 15-24) (modeled ILO estimate)	SL.UEM.1524.ZS	2011	9.3
5253453	China	CHN	Unemployment, youth total (% of total labor force ages 15-24) (modeled ILO estimate)	SL.UEM.1524.ZS	2012	9.7
5423502	China	CHN	Unemployment, youth total (% of total labor force ages 15-24) (modeled ILO estimate)	SL.UEM.1524.ZS	2013	10.1
5564813	China	CHN	Unemployment, youth total (% of total labor force ages 15-24) (modeled ILO estimate)	SL.UEM.1524.ZS	2014	10.5

plotting Total youth Unemployment - From 1991 up to 2014

In [58]:

```
plt.figure(figsize=(15,8))
plt.plot(youthdata['Year'].values,youthdata['Value'].values,'-yo')
plt.axis([1989, 2015,0,15])
```

```
for x,y in zip(youthdata['Year'].values,youthdata['Value'].values):
    label = "{:.1f}".format(y)
    plt.annotate(label,(x,y),textcoords="offset points",xytext=(0,10),ha='cen

plt.grid(True)
plt.ylabel('Unemployment %')
plt.title('Total youth Unemployment - From 1991 up to 2014')
```

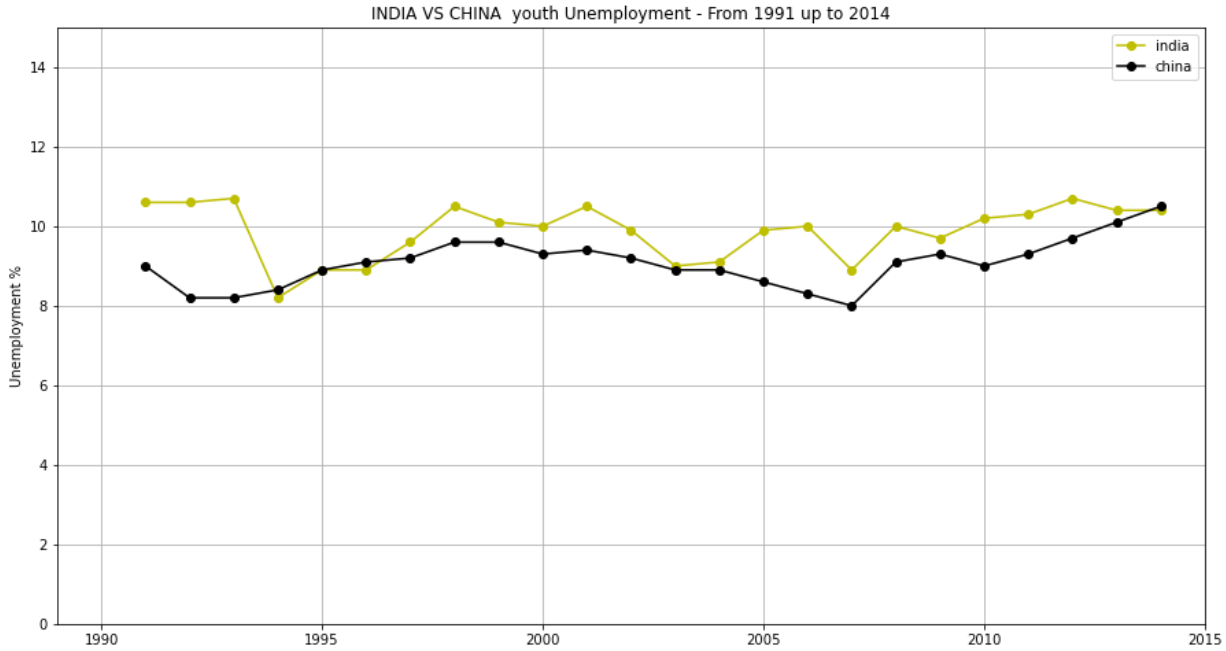
Out[58]: Text(0.5, 1.0, 'Total youth Unemployment - From 1991 up to 2014')

plotting INDIA VS CHINA youth Unemployment - From 1991 up to 2014

In [59]:

```
plt.figure(figsize=(15,8))
plt.plot(youthdata['Year'].values,youthdata['Value'].values,'-yo',label='indi
plt.plot(chinayouthdata['Year'].values,chinayouthdata['Value'].values,'-ko',l

plt.axis([1989, 2015,0,15])
plt.legend()

plt.grid(True)
plt.ylabel('Unemployment %')
plt.title('INDIA VS CHINA  youth Unemployment - From 1991 up to 2014')
```

Out[59]: Text(0.5, 1.0, 'INDIA VS CHINA youth Unemployment - From 1991 up to 2014')



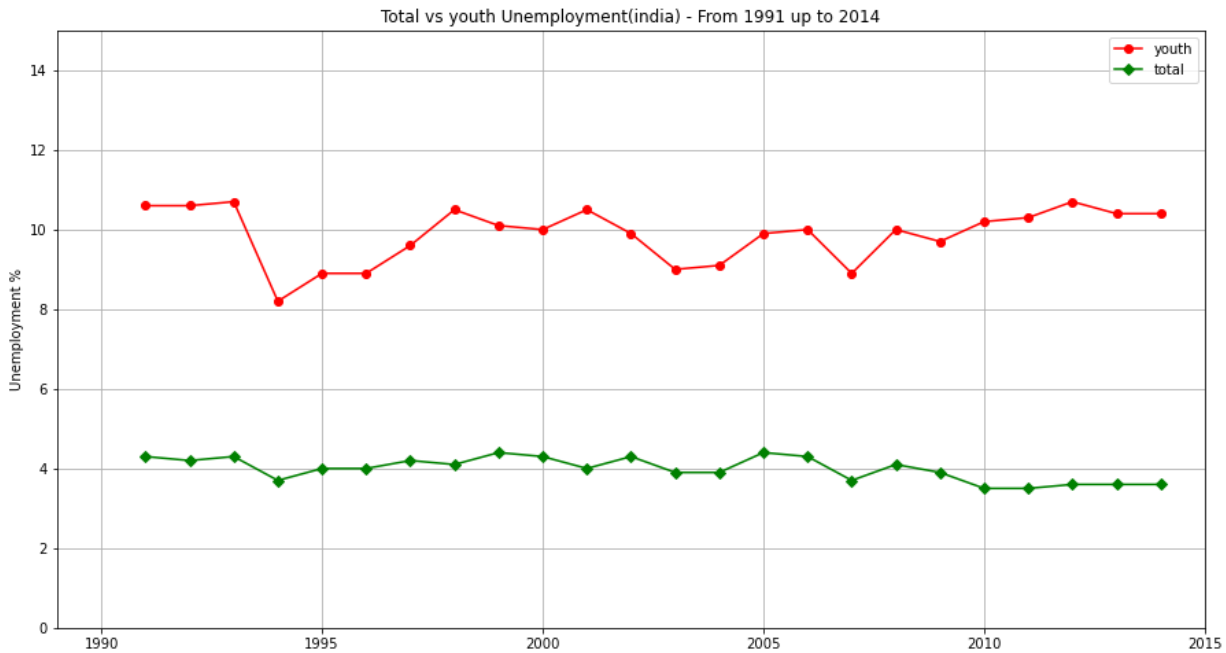
plotting Total vs youth Unemployment(india) - From 1991 up to 2014

In [60]:

```
#Total vs youth Unemployment
plt.figure(figsize=(15,8))
plt.plot(youthdata['Year'].values,youthdata['Value'].values,'-ro',label='youth
plt.axis([1989, 2015,0,15])
plt.grid(True)

plt.ylabel('Unemployment %')
plt.plot(iv1['Year'].values,iv1['Value'].values,'-gD',label='total')
plt.title('Total vs youth Unemployment(india) - From 1991 up to 2014')
plt.legend()
```

Out[60]:

```
<matplotlib.legend.Legend at 0x7f7fa872aa60>
```



In [61]:

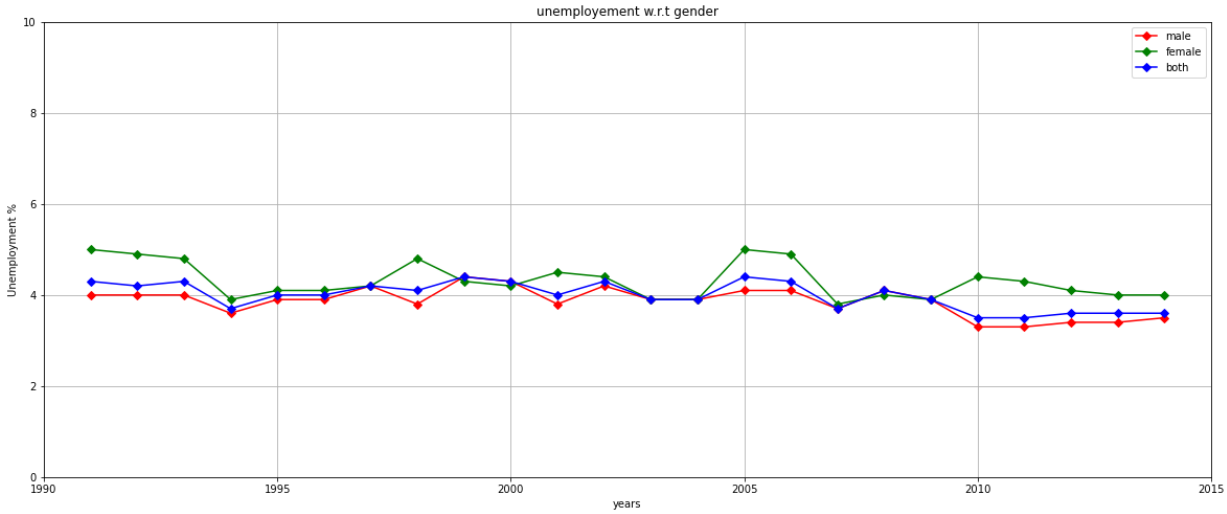
```
ue_mcode='SL.UEM.TOTL.MA.ZS'
ue_fcode='SL.UEM.TOTL.FE.ZS'
uemc=india['IndicatorCode'].str.contains(ue_mcode)
uefc=india['IndicatorCode'].str.contains(ue_fcode)
```

```
male_ue=india[uemc]
female_ue=india[uefc]
type(female_ue)
```

Out[61]: pandas.core.frame.DataFrame

In [62]:
```
#plotting unemployement w.r.t gender

plt.figure(figsize=(20,8))

plt.plot(male_ue['Year'].values,male_ue['Value'].values,'-rD',label='male')
plt.plot(female_ue['Year'].values,female_ue['Value'].values,'-gD',label='fema

plt.plot(iv1['Year'].values,iv1['Value'].values,'-bD',label='both')
plt.axis([1990, 2015,0,10])

plt.grid(True)
plt.xlabel('years')
plt.ylabel('Unemployment %')
plt.title('unemployement w.r.t gender')
plt.legend()
```

Out[62]: <matplotlib.legend.Legend at 0x7f7fac4fca60>



In [63]:
```
#deep look between 3-6%


plt.figure(figsize=(20,8))

plt.plot(male_ue['Year'].values,male_ue['Value'].values,'-bD',label='male')
plt.plot(female_ue['Year'].values,female_ue['Value'].values,'-rD',label='fema
plt.plot(iv1['Year'].values,iv1['Value'].values,'-gD',label='both')
plt.axis([1990, 2015,3,6])

plt.grid(True)
plt.xlabel('years')
plt.ylabel('Unemployment %')
plt.title('unemployement w.r.t gender')
plt.legend()
```

Out[63]: <matplotlib.legend.Legend at 0x7f7f4e1bd6a0>

In [64]:

```
ymale_code='SL.UEM.1524.MA.ZS'
yfe_code='SL.UEM.1524.FE.ZS'
youthm=india['IndicatorCode'].str.contains(ymale_code)
youthf=india['IndicatorCode'].str.contains(yfe_code)
youthmdata=india[youthm]
youthfdata=india[youthf]
youthmdata[['Year','Value']]
```

Out[64]:

	Year	Value
2055403	1991	10.2
2173545	1992	10.2
2296510	1993	10.4
2421309	1994	8.3
2551189	1995	9.0
2686195	1996	9.0
2821653	1997	9.5
2958608	1998	10.1
3097954	1999	10.0
3246346	2000	9.9
3398657	2001	10.2
3551258	2002	9.8
3705497	2003	9.0
3860889	2004	9.1
4030471	2005	9.8
4208967	2006	9.8
4387806	2007	8.9
4568143	2008	9.9
4747271	2009	9.7
4930122	2010	9.8
5111872	2011	9.9
5287545	2012	10.4

	Year	Value
5453669	2013	10.1
5585793	2014	10.2

In [65]:

```
plt.figure(figsize=(15,8))
plt.plot(youthmdata['Year'].values,youthmdata['Value'].values,'--o',label='yo
plt.plot(youthfdata['Year'].values,youthfdata['Value'].values,'--h',label='yo
plt.plot(youthdata['Year'].values,youthdata['Value'].values,'-.yD',label='you
plt.axis([1990,2015,0,15])
plt.grid(True)
plt.title('Youth unemployement w.r.t gender')
plt.xlabel('years')
plt.ylabel('Unemployment %')
plt.legend()
```

Out[65]: <matplotlib.legend.Legend at 0x7f7f4f178460>

In [66]:

```
#unemployement by education
prtc='SL.UEM.PRIM.ZS'
prmc='SL.UEM.PRIM.MA.ZS'
prfc='SL.UEM.PRIM.FE.ZS'
srtc='SL.UEM.SECO.ZS'
srmc='SL.UEM.SECO.MA.ZS'
srfc='SL.UEM.SECO.FE.ZS'
trtc='SL.UEM.TERT.ZS'
trmc='SL.UEM.TERT.MA.ZS'
trfc='SL.UEM.TERT.FE.ZS'
prt=india['IndicatorCode'].str.contains(prtc)
prm=india['IndicatorCode'].str.contains(prmc)
prf=india['IndicatorCode'].str.contains(prfc)
srt=india['IndicatorCode'].str.contains(srtc)
srm=india['IndicatorCode'].str.contains(srmc)
srf=india['IndicatorCode'].str.contains(srfc)
trt=india['IndicatorCode'].str.contains(trtc)
trm=india['IndicatorCode'].str.contains(trmc)
trf=india['IndicatorCode'].str.contains(trfc)
prtd=india[prt]
prmd=india[prm]
prfd=india[prf]
```

```
srtd=india[srt]
srmd=india[srm]
srfd=india[srf]
trtd=india[trt]
trmd=india[trm]
trfd=india[trf]
#trfd 1987-2010
trfd
```

Out[66]:

	CountryName	CountryCode	IndicatorName	IndicatorCode	Year	Value
1653456	India	IND	Unemployment with tertiary education, female (% of female unemployment)	SL.UEM.TERT.FE.ZS	1987	27.500000
1742569	India	IND	Unemployment with tertiary education, female (% of female unemployment)	SL.UEM.TERT.FE.ZS	1988	28.900000
1833700	India	IND	Unemployment with tertiary education, female (% of female unemployment)	SL.UEM.TERT.FE.ZS	1989	28.900000
1938262	India	IND	Unemployment with tertiary education, female (% of female unemployment)	SL.UEM.TERT.FE.ZS	1990	29.900000
2055397	India	IND	Unemployment with tertiary education, female (% of female unemployment)	SL.UEM.TERT.FE.ZS	1991	30.000000
2173539	India	IND	Unemployment with tertiary education, female (% of female unemployment)	SL.UEM.TERT.FE.ZS	1992	30.900000
2296504	India	IND	Unemployment with tertiary education, female (% of female unemployment)	SL.UEM.TERT.FE.ZS	1993	31.299999
2421299	India	IND	Unemployment with tertiary education, female (% of female unemployment)	SL.UEM.TERT.FE.ZS	1994	32.099998

	CountryName	CountryCode	IndicatorName	IndicatorCode	Year	Value
2551180	India	IND	Unemployment with tertiary education, female (% of female unemployment)	SL.UEM.TERT.FE.ZS	1995	33.299999
2686186	India	IND	Unemployment with tertiary education, female (% of female unemployment)	SL.UEM.TERT.FE.ZS	1996	33.599998
2821644	India	IND	Unemployment with tertiary education, female (% of female unemployment)	SL.UEM.TERT.FE.ZS	1997	34.099998
2958599	India	IND	Unemployment with tertiary education, female (% of female unemployment)	SL.UEM.TERT.FE.ZS	1998	35.200001
3097948	India	IND	Unemployment with tertiary education, female (% of female unemployment)	SL.UEM.TERT.FE.ZS	1999	35.700001
3246336	India	IND	Unemployment with tertiary education, female (% of female unemployment)	SL.UEM.TERT.FE.ZS	2000	34.099998
3398651	India	IND	Unemployment with tertiary education, female (% of female unemployment)	SL.UEM.TERT.FE.ZS	2001	36.900002
3551252	India	IND	Unemployment with tertiary education, female (% of female unemployment)	SL.UEM.TERT.FE.ZS	2002	35.099998
3705491	India	IND	Unemployment with tertiary education, female (% of female unemployment)	SL.UEM.TERT.FE.ZS	2003	34.700001
3860883	India	IND	Unemployment with tertiary education, female (% of female unemployment)	SL.UEM.TERT.FE.ZS	2004	32.099998

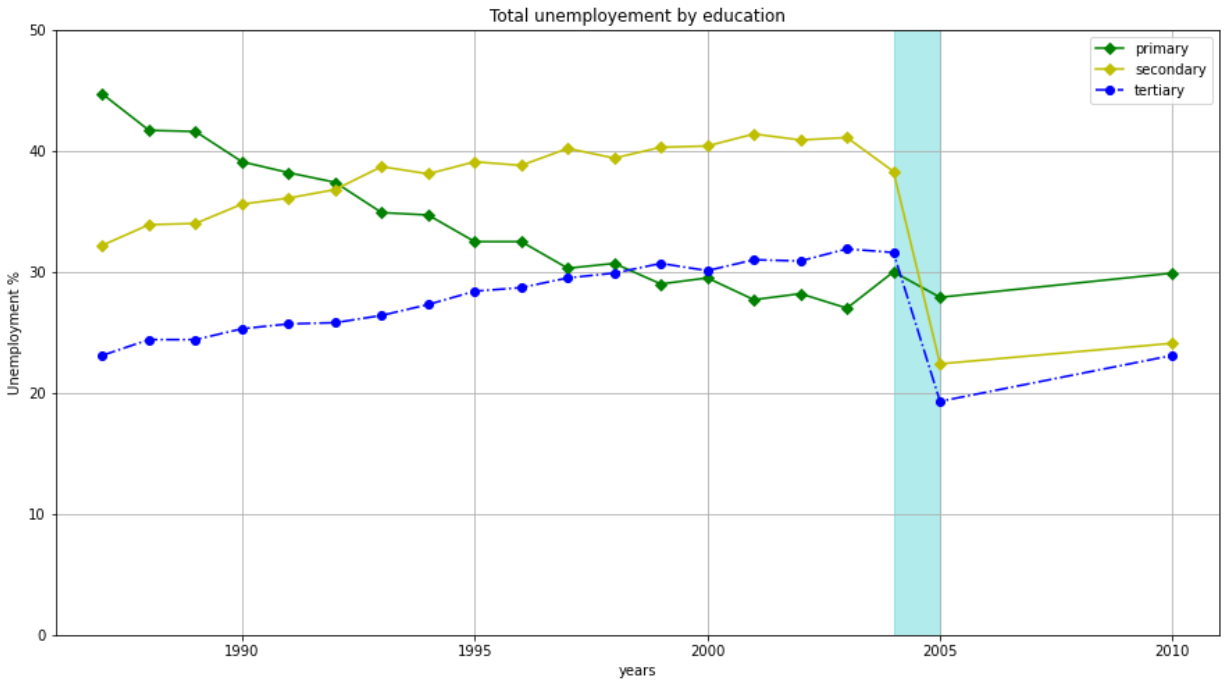
	CountryName	CountryCode	IndicatorName	IndicatorCode	Year	Value
4030461	India	IND	Unemployment with tertiary education, female (% of female unemployment)	SL.UEM.TERT.FE.ZS	2005	23.000000
4930112	India	IND	Unemployment with tertiary education, female (% of female unemployment)	SL.UEM.TERT.FE.ZS	2010	28.600000

In [67]:

```
#plotting total unemployement by education

plt.figure(figsize=(15,8))
plt.plot(prtd['Year'].values,prtd['Value'].values,'-gD',label='primary')
plt.plot(srtd['Year'].values,srtd['Value'].values,'-yD',label='secondary')
plt.plot(trtd['Year'].values,trtd['Value'].values,'-.bo',label='tertiary')

plt.axvspan(2004, 2005, color='c', alpha=0.3)

plt.grid(True)
plt.title('Total unemployement by education')
plt.xlabel('years')
plt.ylabel('Unemployment %')
plt.axis([1986,2011,0,50])
plt.legend()
```

Out[67]:

```
<matplotlib.legend.Legend at 0x7f7fdc4e6a90>
```

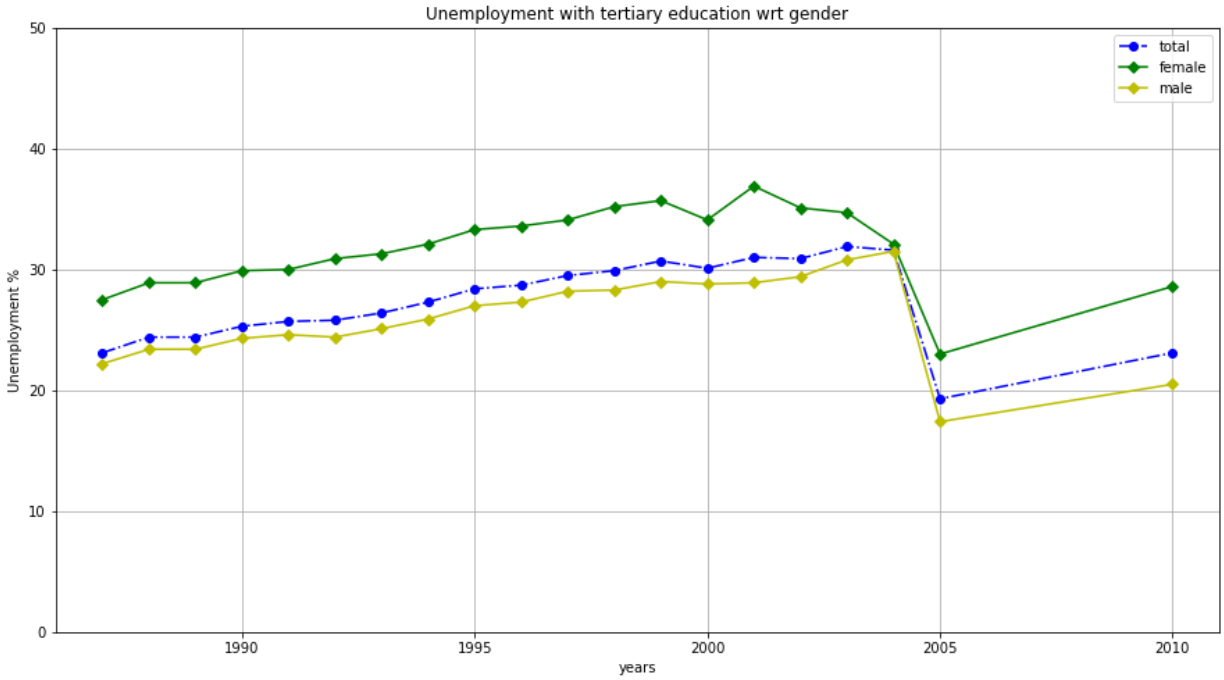


In [68]:

```
#Unemployment with tertiary education wrt gender
plt.figure(figsize=(15,8))
plt.plot(trtd['Year'].values,trtd['Value'].values,'-.bo',label='total')
plt.plot(trfd['Year'].values,trfd['Value'].values,'-gD',label='female')
plt.plot(trmd['Year'].values,trmd['Value'].values,'-yD',label='male')
plt.grid(True)
plt.title('Unemployment with tertiary education wrt gender')
```

```
plt.xlabel('years')
plt.ylabel('Unemployment %')
plt.axis([1986,2011,0,50])
plt.legend()
```

Out[68]: <matplotlib.legend.Legend at 0x7f7fce68df10>



In [69]:

```
#Unemployment with primary education wrt gender
plt.figure(figsize=(15,8))
plt.plot(prtd['Year'].values,prtd['Value'].values,'-.bo',label='total')
plt.plot(prfd['Year'].values,prfd['Value'].values,'-gD',label='female')
plt.plot(prmd['Year'].values,prmd['Value'].values,'-yD',label='male')
plt.grid(True)
plt.title('Unemployment with primary education wrt gender')
plt.xlabel('years')
plt.ylabel('Unemployment %')
plt.axis([1986,2011,0,50])
plt.legend()
```

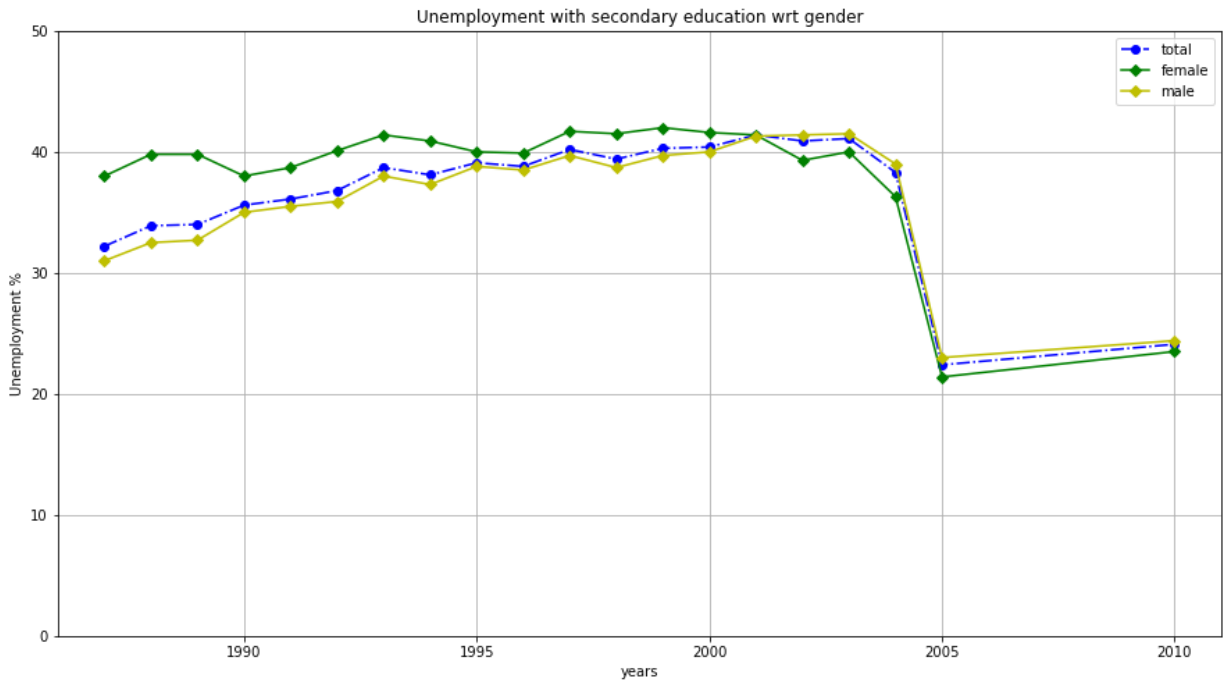
Out[69]: <matplotlib.legend.Legend at 0x7f7fce6bf5e0>

In [70]:

```
#Unemployment with secondary education wrt gender
plt.figure(figsize=(15,8))
plt.plot(srtd['Year'].values,srtd['Value'].values,'-.bo',label='total')
plt.plot(srfd['Year'].values,srfd['Value'].values,'-gD',label='female')
plt.plot(srmd['Year'].values,srmd['Value'].values,'-yD',label='male')
plt.title('Unemployment with secondary education wrt gender')
plt.grid(True)
plt.xlabel('years')
plt.ylabel('Unemployment %')
plt.axis([1986,2011,0,50])
plt.legend()
```

Out[70]:

```
<matplotlib.legend.Legend at 0x7f7fce6cf730>
```



In [71]:

```
iv1
```

Out[71]:

	CountryName	CountryCode	IndicatorName	IndicatorCode	Year	Value

	CountryName	CountryCode	IndicatorName	IndicatorCode	Year	Value
2055401	India	IND	Unemployment, total (% of total labor force)	SL.UEM.TOTL.ZS	1991	4.3
2173543	India	IND	Unemployment, total (% of total labor force)	SL.UEM.TOTL.ZS	1992	4.2
2296508	India	IND	Unemployment, total (% of total labor force)	SL.UEM.TOTL.ZS	1993	4.3
2421305	India	IND	Unemployment, total (% of total labor force)	SL.UEM.TOTL.ZS	1994	3.7
2551186	India	IND	Unemployment, total (% of total labor force)	SL.UEM.TOTL.ZS	1995	4.0
2686192	India	IND	Unemployment, total (% of total labor force)	SL.UEM.TOTL.ZS	1996	4.0
2821650	India	IND	Unemployment, total (% of total labor force)	SL.UEM.TOTL.ZS	1997	4.2
2958605	India	IND	Unemployment, total (% of total labor force)	SL.UEM.TOTL.ZS	1998	4.1
3097952	India	IND	Unemployment, total (% of total labor force)	SL.UEM.TOTL.ZS	1999	4.4
3246342	India	IND	Unemployment, total (% of total labor force)	SL.UEM.TOTL.ZS	2000	4.3
3398655	India	IND	Unemployment, total (% of total labor force)	SL.UEM.TOTL.ZS	2001	4.0
3551256	India	IND	Unemployment, total (% of total labor force)	SL.UEM.TOTL.ZS	2002	4.3
3705495	India	IND	Unemployment, total (% of total labor force)	SL.UEM.TOTL.ZS	2003	3.9
3860887	India	IND	Unemployment, total (% of total labor force)	SL.UEM.TOTL.ZS	2004	3.9
4030467	India	IND	Unemployment, total (% of total labor force)	SL.UEM.TOTL.ZS	2005	4.4
4208965	India	IND	Unemployment, total (% of total labor force)	SL.UEM.TOTL.ZS	2006	4.3
4387804	India	IND	Unemployment, total (% of total labor force)	SL.UEM.TOTL.ZS	2007	3.7

	CountryName	CountryCode	IndicatorName	IndicatorCode	Year	Value
4568141	India	IND	Unemployment, total (% of total labor force)	SL.UEM.TOTL.ZS	2008	4.1
4747269	India	IND	Unemployment, total (% of total labor force)	SL.UEM.TOTL.ZS	2009	3.9
4930118	India	IND	Unemployment, total (% of total labor force)	SL.UEM.TOTL.ZS	2010	3.5
5111870	India	IND	Unemployment, total (% of total labor force)	SL.UEM.TOTL.ZS	2011	3.5
5287541	India	IND	Unemployment, total (% of total labor force)	SL.UEM.TOTL.ZS	2012	3.6
5453666	India	IND	Unemployment, total (% of total labor force)	SL.UEM.TOTL.ZS	2013	3.6
5585790	India	IND	Unemployment, total (% of total labor force)	SL.UEM.TOTL.ZS	2014	3.6

In [72]:

```
gpcc=india['IndicatorName'].str.contains('GDP per capita growth')
gpcd=india[gpcc]
gpcd2=gpcd[['Year','Value']]
gpcd
```

Out[72]:

	CountryName	CountryCode	IndicatorName	IndicatorCode	Year	Value
36559	India	IND	GDP per capita growth (annual %)	NY.GDP.PCAP.KD.ZG	1961	1.680906
64099	India	IND	GDP per capita growth (annual %)	NY.GDP.PCAP.KD.ZG	1962	0.872152
92544	India	IND	GDP per capita growth (annual %)	NY.GDP.PCAP.KD.ZG	1963	3.847572
121341	India	IND	GDP per capita growth (annual %)	NY.GDP.PCAP.KD.ZG	1964	5.258425
152013	India	IND	GDP per capita growth (annual %)	NY.GDP.PCAP.KD.ZG	1965	-4.636193
183747	India	IND	GDP per capita growth (annual %)	NY.GDP.PCAP.KD.ZG	1966	-2.116064
215665	India	IND	GDP per capita growth (annual %)	NY.GDP.PCAP.KD.ZG	1967	5.591368
248280	India	IND	GDP per capita growth (annual %)	NY.GDP.PCAP.KD.ZG	1968	1.221288

	CountryName	CountryCode	IndicatorName	IndicatorCode	Year	Value
281064	India	IND	GDP per capita growth (annual %)	NY.GDP.PCAP.KD.ZG	1969	4.264737
329073	India	IND	GDP per capita growth (annual %)	NY.GDP.PCAP.KD.ZG	1970	2.860547
394258	India	IND	GDP per capita growth (annual %)	NY.GDP.PCAP.KD.ZG	1971	-0.628528
463256	India	IND	GDP per capita growth (annual %)	NY.GDP.PCAP.KD.ZG	1972	-2.816531
532956	India	IND	GDP per capita growth (annual %)	NY.GDP.PCAP.KD.ZG	1973	0.919400
602843	India	IND	GDP per capita growth (annual %)	NY.GDP.PCAP.KD.ZG	1974	-1.145818
674091	India	IND	GDP per capita growth (annual %)	NY.GDP.PCAP.KD.ZG	1975	6.646849
746938	India	IND	GDP per capita growth (annual %)	NY.GDP.PCAP.KD.ZG	1976	-0.650692
821492	India	IND	GDP per capita growth (annual %)	NY.GDP.PCAP.KD.ZG	1977	4.828461
896945	India	IND	GDP per capita growth (annual %)	NY.GDP.PCAP.KD.ZG	1978	3.326808
972837	India	IND	GDP per capita growth (annual %)	NY.GDP.PCAP.KD.ZG	1979	-7.383056
1051510	India	IND	GDP per capita growth (annual %)	NY.GDP.PCAP.KD.ZG	1980	4.306171
1134597	India	IND	GDP per capita growth (annual %)	NY.GDP.PCAP.KD.ZG	1981	3.579983
1219300	India	IND	GDP per capita growth (annual %)	NY.GDP.PCAP.KD.ZG	1982	1.103574
1304518	India	IND	GDP per capita growth (annual %)	NY.GDP.PCAP.KD.ZG	1983	4.838220
1390101	India	IND	GDP per capita growth (annual %)	NY.GDP.PCAP.KD.ZG	1984	1.473302
1476577	India	IND	GDP per capita growth (annual %)	NY.GDP.PCAP.KD.ZG	1985	2.909773

	CountryName	CountryCode	IndicatorName	IndicatorCode	Year	Value
1564306	India	IND	GDP per capita growth (annual %)	NY.GDP.PCAP.KD.ZG	1986	2.480554
1653019	India	IND	GDP per capita growth (annual %)	NY.GDP.PCAP.KD.ZG	1987	1.723166
1742142	India	IND	GDP per capita growth (annual %)	NY.GDP.PCAP.KD.ZG	1988	7.302186
1833276	India	IND	GDP per capita growth (annual %)	NY.GDP.PCAP.KD.ZG	1989	3.736824
1937716	India	IND	GDP per capita growth (annual %)	NY.GDP.PCAP.KD.ZG	1990	3.367803
2054884	India	IND	GDP per capita growth (annual %)	NY.GDP.PCAP.KD.ZG	1991	-0.980435
2173000	India	IND	GDP per capita growth (annual %)	NY.GDP.PCAP.KD.ZG	1992	3.393896
2295977	India	IND	GDP per capita growth (annual %)	NY.GDP.PCAP.KD.ZG	1993	2.709609
2420765	India	IND	GDP per capita growth (annual %)	NY.GDP.PCAP.KD.ZG	1994	4.607613
2550627	India	IND	GDP per capita growth (annual %)	NY.GDP.PCAP.KD.ZG	1995	5.528993
2685651	India	IND	GDP per capita growth (annual %)	NY.GDP.PCAP.KD.ZG	1996	5.527065
2821083	India	IND	GDP per capita growth (annual %)	NY.GDP.PCAP.KD.ZG	1997	2.117892
2958065	India	IND	GDP per capita growth (annual %)	NY.GDP.PCAP.KD.ZG	1998	4.242758
3097354	India	IND	GDP per capita growth (annual %)	NY.GDP.PCAP.KD.ZG	1999	6.892407
3245710	India	IND	GDP per capita growth (annual %)	NY.GDP.PCAP.KD.ZG	2000	2.017019
3398045	India	IND	GDP per capita growth (annual %)	NY.GDP.PCAP.KD.ZG	2001	3.023865
3550672	India	IND	GDP per capita growth (annual %)	NY.GDP.PCAP.KD.ZG	2002	2.061403

	CountryName	CountryCode	IndicatorName	IndicatorCode	Year	Value
3704908	India	IND	GDP per capita growth (annual %)	NY.GDP.PCAP.KD.ZG	2003	6.091183
3860275	India	IND	GDP per capita growth (annual %)	NY.GDP.PCAP.KD.ZG	2004	6.193579
4029788	India	IND	GDP per capita growth (annual %)	NY.GDP.PCAP.KD.ZG	2005	7.574690
4208336	India	IND	GDP per capita growth (annual %)	NY.GDP.PCAP.KD.ZG	2006	7.593907
4387179	India	IND	GDP per capita growth (annual %)	NY.GDP.PCAP.KD.ZG	2007	8.163458
4567494	India	IND	GDP per capita growth (annual %)	NY.GDP.PCAP.KD.ZG	2008	2.382198
4746622	India	IND	GDP per capita growth (annual %)	NY.GDP.PCAP.KD.ZG	2009	6.950927
4929438	India	IND	GDP per capita growth (annual %)	NY.GDP.PCAP.KD.ZG	2010	8.754970
5111238	India	IND	GDP per capita growth (annual %)	NY.GDP.PCAP.KD.ZG	2011	5.231136
5286924	India	IND	GDP per capita growth (annual %)	NY.GDP.PCAP.KD.ZG	2012	3.738897
5453108	India	IND	GDP per capita growth (annual %)	NY.GDP.PCAP.KD.ZG	2013	5.570037
5585322	India	IND	GDP per capita growth (annual %)	NY.GDP.PCAP.KD.ZG	2014	5.978180

In [73]:

```
gnpb=india['IndicatorName'].str.contains('GDP growth ')
gdata1=india[gnpb]
gdata1
```

Out[73]:

	CountryName	CountryCode	IndicatorName	IndicatorCode	Year	Value
36554	India	IND	GDP growth (annual %)	NY.GDP.MKTP.KD.ZG	1961	3.722743
64094	India	IND	GDP growth (annual %)	NY.GDP.MKTP.KD.ZG	1962	2.931128
92539	India	IND	GDP growth (annual %)	NY.GDP.MKTP.KD.ZG	1963	5.994353
121336	India	IND	GDP growth (annual %)	NY.GDP.MKTP.KD.ZG	1964	7.452950

	CountryName	CountryCode	IndicatorName	IndicatorCode	Year	Value
152008	India	IND	GDP growth (annual %)	NY.GDP.MKTP.KD.ZG	1965	-2.635770
183742	India	IND	GDP growth (annual %)	NY.GDP.MKTP.KD.ZG	1966	-0.055329
215660	India	IND	GDP growth (annual %)	NY.GDP.MKTP.KD.ZG	1967	7.825963
248275	India	IND	GDP growth (annual %)	NY.GDP.MKTP.KD.ZG	1968	3.387929
281059	India	IND	GDP growth (annual %)	NY.GDP.MKTP.KD.ZG	1969	6.539700
329068	India	IND	GDP growth (annual %)	NY.GDP.MKTP.KD.ZG	1970	5.157230
394253	India	IND	GDP growth (annual %)	NY.GDP.MKTP.KD.ZG	1971	1.642930
463251	India	IND	GDP growth (annual %)	NY.GDP.MKTP.KD.ZG	1972	-0.553301
532951	India	IND	GDP growth (annual %)	NY.GDP.MKTP.KD.ZG	1973	3.295521
602838	India	IND	GDP growth (annual %)	NY.GDP.MKTP.KD.ZG	1974	1.185336
674086	India	IND	GDP growth (annual %)	NY.GDP.MKTP.KD.ZG	1975	9.149912
746933	India	IND	GDP growth (annual %)	NY.GDP.MKTP.KD.ZG	1976	1.663104
821487	India	IND	GDP growth (annual %)	NY.GDP.MKTP.KD.ZG	1977	7.254765
896940	India	IND	GDP growth (annual %)	NY.GDP.MKTP.KD.ZG	1978	5.712532
972832	India	IND	GDP growth (annual %)	NY.GDP.MKTP.KD.ZG	1979	-5.238183
1051505	India	IND	GDP growth (annual %)	NY.GDP.MKTP.KD.ZG	1980	6.735822
1134592	India	IND	GDP growth (annual %)	NY.GDP.MKTP.KD.ZG	1981	6.006204
1219295	India	IND	GDP growth (annual %)	NY.GDP.MKTP.KD.ZG	1982	3.475733
1304513	India	IND	GDP growth (annual %)	NY.GDP.MKTP.KD.ZG	1983	7.288893
1390096	India	IND	GDP growth (annual %)	NY.GDP.MKTP.KD.ZG	1984	3.820738
1476572	India	IND	GDP growth (annual %)	NY.GDP.MKTP.KD.ZG	1985	5.254299
1564301	India	IND	GDP growth (annual %)	NY.GDP.MKTP.KD.ZG	1986	4.776564
1653014	India	IND	GDP growth (annual %)	NY.GDP.MKTP.KD.ZG	1987	3.965356
1742137	India	IND	GDP growth (annual %)	NY.GDP.MKTP.KD.ZG	1988	9.627783

	CountryName	CountryCode	IndicatorName	IndicatorCode	Year	Value
1833271	India	IND	GDP growth (annual %)	NY.GDP.MKTP.KD.ZG	1989	5.947343
1937711	India	IND	GDP growth (annual %)	NY.GDP.MKTP.KD.ZG	1990	5.533455
2054879	India	IND	GDP growth (annual %)	NY.GDP.MKTP.KD.ZG	1991	1.056831
2172995	India	IND	GDP growth (annual %)	NY.GDP.MKTP.KD.ZG	1992	5.482396
2295972	India	IND	GDP growth (annual %)	NY.GDP.MKTP.KD.ZG	1993	4.750776
2420760	India	IND	GDP growth (annual %)	NY.GDP.MKTP.KD.ZG	1994	6.658924
2550622	India	IND	GDP growth (annual %)	NY.GDP.MKTP.KD.ZG	1995	7.574492
2685646	India	IND	GDP growth (annual %)	NY.GDP.MKTP.KD.ZG	1996	7.549522
2821078	India	IND	GDP growth (annual %)	NY.GDP.MKTP.KD.ZG	1997	4.049821
2958060	India	IND	GDP growth (annual %)	NY.GDP.MKTP.KD.ZG	1998	6.184416
3097349	India	IND	GDP growth (annual %)	NY.GDP.MKTP.KD.ZG	1999	8.845756
3245705	India	IND	GDP growth (annual %)	NY.GDP.MKTP.KD.ZG	2000	3.840991
3398040	India	IND	GDP growth (annual %)	NY.GDP.MKTP.KD.ZG	2001	4.823966
3550667	India	IND	GDP growth (annual %)	NY.GDP.MKTP.KD.ZG	2002	3.803975
3704903	India	IND	GDP growth (annual %)	NY.GDP.MKTP.KD.ZG	2003	7.860381
3860270	India	IND	GDP growth (annual %)	NY.GDP.MKTP.KD.ZG	2004	7.922937
4029783	India	IND	GDP growth (annual %)	NY.GDP.MKTP.KD.ZG	2005	9.284832
4208331	India	IND	GDP growth (annual %)	NY.GDP.MKTP.KD.ZG	2006	9.263959
4387174	India	IND	GDP growth (annual %)	NY.GDP.MKTP.KD.ZG	2007	9.801360
4567489	India	IND	GDP growth (annual %)	NY.GDP.MKTP.KD.ZG	2008	3.890957
4746617	India	IND	GDP growth (annual %)	NY.GDP.MKTP.KD.ZG	2009	8.479787
4929433	India	IND	GDP growth (annual %)	NY.GDP.MKTP.KD.ZG	2010	10.259963
5111233	India	IND	GDP growth (annual %)	NY.GDP.MKTP.KD.ZG	2011	6.638353
5286919	India	IND	GDP growth (annual %)	NY.GDP.MKTP.KD.ZG	2012	5.081418

	CountryName	CountryCode	IndicatorName	IndicatorCode	Year	Value
5453103	India	IND	GDP growth (annual %)	NY.GDP.MKTP.KD.ZG	2013	6.899217
5585317	India	IND	GDP growth (annual %)	NY.GDP.MKTP.KD.ZG	2014	7.286253

In [74]:

```
gdpgrowth=gdata1[['Year','Value']]
gdpgrowth
```

Out[74]:

	Year	Value
36554	1961	3.722743
64094	1962	2.931128
92539	1963	5.994353
121336	1964	7.452950
152008	1965	-2.635770
183742	1966	-0.055329
215660	1967	7.825963
248275	1968	3.387929
281059	1969	6.539700
329068	1970	5.157230
394253	1971	1.642930
463251	1972	-0.553301
532951	1973	3.295521
602838	1974	1.185336
674086	1975	9.149912
746933	1976	1.663104
821487	1977	7.254765
896940	1978	5.712532
972832	1979	-5.238183
1051505	1980	6.735822
1134592	1981	6.006204
1219295	1982	3.475733
1304513	1983	7.288893
1390096	1984	3.820738
1476572	1985	5.254299
1564301	1986	4.776564
1653014	1987	3.965356
1742137	1988	9.627783
1833271	1989	5.947343
1937711	1990	5.533455

	Year	Value
2054879	1991	1.056831
2172995	1992	5.482396
2295972	1993	4.750776
2420760	1994	6.658924
2550622	1995	7.574492
2685646	1996	7.549522
2821078	1997	4.049821
2958060	1998	6.184416
3097349	1999	8.845756
3245705	2000	3.840991
3398040	2001	4.823966
3550667	2002	3.803975
3704903	2003	7.860381
3860270	2004	7.922937
4029783	2005	9.284832
4208331	2006	9.263959
4387174	2007	9.801360
4567489	2008	3.890957
4746617	2009	8.479787
4929433	2010	10.259963
5111233	2011	6.638353
5286919	2012	5.081418
5453103	2013	6.899217
5585317	2014	7.286253

In [90]:
```
iv1['rate']=iv1['Value'].diff()
```

In [91]:
```
iv1=iv1.dropna()
```

In [92]:
```
iv1[['Year','rate']]
```

Out[92]:

	Year	rate
2173543	1992	-0.1
2296508	1993	0.1
2421305	1994	-0.6
2551186	1995	0.3
2686192	1996	0.0
2821650	1997	0.2

	Year	rate
2958605	1998	-0.1
3097952	1999	0.3
3246342	2000	-0.1
3398655	2001	-0.3
3551256	2002	0.3
3705495	2003	-0.4
3860887	2004	0.0
4030467	2005	0.5
4208965	2006	-0.1
4387804	2007	-0.6
4568141	2008	0.4
4747269	2009	-0.2
4930118	2010	-0.4
5111870	2011	0.0
5287541	2012	0.1
5453666	2013	0.0
5585790	2014	0.0

merging dataframes iv1 and gdpgrowth

In [93]:
```
t=pd.merge(iv1 ,gdpgrowth,on='Year',how='left' )
t
```

Out[93]:

	CountryName	CountryCode	IndicatorName	IndicatorCode	Year	Value_x	rate	Valu
0	India	IND	Unemployment, total (% of total labor force)	SL.UEM.TOTL.ZS	1992	4.2	-0.1	5.482
1	India	IND	Unemployment, total (% of total labor force)	SL.UEM.TOTL.ZS	1993	4.3	0.1	4.750
2	India	IND	Unemployment, total (% of total labor force)	SL.UEM.TOTL.ZS	1994	3.7	-0.6	6.658
3	India	IND	Unemployment, total (% of total labor force)	SL.UEM.TOTL.ZS	1995	4.0	0.3	7.574
4	India	IND	Unemployment, total (% of total labor force)	SL.UEM.TOTL.ZS	1996	4.0	0.0	7.549
5	India	IND	Unemployment, total (% of total labor force)	SL.UEM.TOTL.ZS	1997	4.2	0.2	4.049

	CountryName	CountryCode	IndicatorName	IndicatorCode	Year	Value_x	rate	Valu
6	India	IND	Unemployment, total (% of total labor force)	SL.UEM.TOTL.ZS	1998	4.1	-0.1	6.184
7	India	IND	Unemployment, total (% of total labor force)	SL.UEM.TOTL.ZS	1999	4.4	0.3	8.845
8	India	IND	Unemployment, total (% of total labor force)	SL.UEM.TOTL.ZS	2000	4.3	-0.1	3.840
9	India	IND	Unemployment, total (% of total labor force)	SL.UEM.TOTL.ZS	2001	4.0	-0.3	4.823
10	India	IND	Unemployment, total (% of total labor force)	SL.UEM.TOTL.ZS	2002	4.3	0.3	3.803
11	India	IND	Unemployment, total (% of total labor force)	SL.UEM.TOTL.ZS	2003	3.9	-0.4	7.860
12	India	IND	Unemployment, total (% of total labor force)	SL.UEM.TOTL.ZS	2004	3.9	0.0	7.922
13	India	IND	Unemployment, total (% of total labor force)	SL.UEM.TOTL.ZS	2005	4.4	0.5	9.284
14	India	IND	Unemployment, total (% of total labor force)	SL.UEM.TOTL.ZS	2006	4.3	-0.1	9.263
15	India	IND	Unemployment, total (% of total labor force)	SL.UEM.TOTL.ZS	2007	3.7	-0.6	9.801
16	India	IND	Unemployment, total (% of total labor force)	SL.UEM.TOTL.ZS	2008	4.1	0.4	3.890
17	India	IND	Unemployment, total (% of total labor force)	SL.UEM.TOTL.ZS	2009	3.9	-0.2	8.479
18	India	IND	Unemployment, total (% of total labor force)	SL.UEM.TOTL.ZS	2010	3.5	-0.4	10.259
19	India	IND	Unemployment, total (% of total labor force)	SL.UEM.TOTL.ZS	2011	3.5	0.0	6.638
20	India	IND	Unemployment, total (% of total labor force)	SL.UEM.TOTL.ZS	2012	3.6	0.1	5.081
21	India	IND	Unemployment, total (% of total labor force)	SL.UEM.TOTL.ZS	2013	3.6	0.0	6.899
22	India	IND	Unemployment, total (% of total labor force)	SL.UEM.TOTL.ZS	2014	3.6	0.0	7.286

In [94]:

```
t=t.rename({'Value_y':'GDPgrowth','rate':'Unemploymentrate'},axis=1)
```

In [95]:

```
t
```

Out[95]:

	CountryName	CountryCode	IndicatorName	IndicatorCode	Year	Value_x	Unemployme
0	India	IND	Unemployment, total (% of total labor force)	SL.UEM.TOTL.ZS	1992	4.2	
1	India	IND	Unemployment, total (% of total labor force)	SL.UEM.TOTL.ZS	1993	4.3	
2	India	IND	Unemployment, total (% of total labor force)	SL.UEM.TOTL.ZS	1994	3.7	
3	India	IND	Unemployment, total (% of total labor force)	SL.UEM.TOTL.ZS	1995	4.0	
4	India	IND	Unemployment, total (% of total labor force)	SL.UEM.TOTL.ZS	1996	4.0	
5	India	IND	Unemployment, total (% of total labor force)	SL.UEM.TOTL.ZS	1997	4.2	
6	India	IND	Unemployment, total (% of total labor force)	SL.UEM.TOTL.ZS	1998	4.1	
7	India	IND	Unemployment, total (% of total labor force)	SL.UEM.TOTL.ZS	1999	4.4	
8	India	IND	Unemployment, total (% of total labor force)	SL.UEM.TOTL.ZS	2000	4.3	
9	India	IND	Unemployment, total (% of total labor force)	SL.UEM.TOTL.ZS	2001	4.0	
10	India	IND	Unemployment, total (% of total labor force)	SL.UEM.TOTL.ZS	2002	4.3	
11	India	IND	Unemployment, total (% of total labor force)	SL.UEM.TOTL.ZS	2003	3.9	
12	India	IND	Unemployment, total (% of total labor force)	SL.UEM.TOTL.ZS	2004	3.9	
13	India	IND	Unemployment, total (% of total labor force)	SL.UEM.TOTL.ZS	2005	4.4	
14	India	IND	Unemployment, total (% of total labor force)	SL.UEM.TOTL.ZS	2006	4.3	
15	India	IND	Unemployment, total (% of total labor force)	SL.UEM.TOTL.ZS	2007	3.7	

	CountryName	CountryCode	IndicatorName	IndicatorCode	Year	Value_x	Unemployme
16	India	IND	Unemployment, total (% of total labor force)	SL.UEM.TOTL.ZS	2008	4.1	
17	India	IND	Unemployment, total (% of total labor force)	SL.UEM.TOTL.ZS	2009	3.9	
18	India	IND	Unemployment, total (% of total labor force)	SL.UEM.TOTL.ZS	2010	3.5	
19	India	IND	Unemployment, total (% of total labor force)	SL.UEM.TOTL.ZS	2011	3.5	
20	India	IND	Unemployment, total (% of total labor force)	SL.UEM.TOTL.ZS	2012	3.6	
21	India	IND	Unemployment, total (% of total labor force)	SL.UEM.TOTL.ZS	2013	3.6	
22	India	IND	Unemployment, total (% of total labor force)	SL.UEM.TOTL.ZS	2014	3.6	

In [96]:

```
t2=pd.merge(iv1 ,gpcd2,on='Year',how='left' )
t2
```

Out[96]:

	CountryName	CountryCode	IndicatorName	IndicatorCode	Year	Value_x	rate	Value
0	India	IND	Unemployment, total (% of total labor force)	SL.UEM.TOTL.ZS	1992	4.2	-0.1	3.3938
1	India	IND	Unemployment, total (% of total labor force)	SL.UEM.TOTL.ZS	1993	4.3	0.1	2.7096
2	India	IND	Unemployment, total (% of total labor force)	SL.UEM.TOTL.ZS	1994	3.7	-0.6	4.6076
3	India	IND	Unemployment, total (% of total labor force)	SL.UEM.TOTL.ZS	1995	4.0	0.3	5.5289
4	India	IND	Unemployment, total (% of total labor force)	SL.UEM.TOTL.ZS	1996	4.0	0.0	5.5270
5	India	IND	Unemployment, total (% of total labor force)	SL.UEM.TOTL.ZS	1997	4.2	0.2	2.1178
6	India	IND	Unemployment, total (% of total labor force)	SL.UEM.TOTL.ZS	1998	4.1	-0.1	4.2427
7	India	IND	Unemployment, total (% of total labor force)	SL.UEM.TOTL.ZS	1999	4.4	0.3	6.8924

	CountryName	CountryCode	IndicatorName	IndicatorCode	Year	Value_x	rate	Value
8	India	IND	Unemployment, total (% of total labor force)	SL.UEM.TOTL.ZS	2000	4.3	-0.1	2.0170
9	India	IND	Unemployment, total (% of total labor force)	SL.UEM.TOTL.ZS	2001	4.0	-0.3	3.0238
10	India	IND	Unemployment, total (% of total labor force)	SL.UEM.TOTL.ZS	2002	4.3	0.3	2.0614
11	India	IND	Unemployment, total (% of total labor force)	SL.UEM.TOTL.ZS	2003	3.9	-0.4	6.0911
12	India	IND	Unemployment, total (% of total labor force)	SL.UEM.TOTL.ZS	2004	3.9	0.0	6.1935
13	India	IND	Unemployment, total (% of total labor force)	SL.UEM.TOTL.ZS	2005	4.4	0.5	7.5746
14	India	IND	Unemployment, total (% of total labor force)	SL.UEM.TOTL.ZS	2006	4.3	-0.1	7.5939
15	India	IND	Unemployment, total (% of total labor force)	SL.UEM.TOTL.ZS	2007	3.7	-0.6	8.1634
16	India	IND	Unemployment, total (% of total labor force)	SL.UEM.TOTL.ZS	2008	4.1	0.4	2.3821
17	India	IND	Unemployment, total (% of total labor force)	SL.UEM.TOTL.ZS	2009	3.9	-0.2	6.9509
18	India	IND	Unemployment, total (% of total labor force)	SL.UEM.TOTL.ZS	2010	3.5	-0.4	8.7549
19	India	IND	Unemployment, total (% of total labor force)	SL.UEM.TOTL.ZS	2011	3.5	0.0	5.2311
20	India	IND	Unemployment, total (% of total labor force)	SL.UEM.TOTL.ZS	2012	3.6	0.1	3.7388
21	India	IND	Unemployment, total (% of total labor force)	SL.UEM.TOTL.ZS	2013	3.6	0.0	5.5700
22	India	IND	Unemployment, total (% of total labor force)	SL.UEM.TOTL.ZS	2014	3.6	0.0	5.9781

In [97]:

```
t2=t2.rename({'Value_y':'GDP per capita growth','rate':'Unemploymentrate'},ax
t2corr=t2[['Unemploymentrate','GDP per capita growth']]
t2corr
```

Out[97]:

	Unemploymentrate	GDP per capita growth
0	-0.1	3.393896

	Unemploymentrate	GDP per capita growth
1	0.1	2.709609
2	-0.6	4.607613
3	0.3	5.528993
4	0.0	5.527065
5	0.2	2.117892
6	-0.1	4.242758
7	0.3	6.892407
8	-0.1	2.017019
9	-0.3	3.023865
10	0.3	2.061403
11	-0.4	6.091183
12	0.0	6.193579
13	0.5	7.574690
14	-0.1	7.593907
15	-0.6	8.163458
16	0.4	2.382198
17	-0.2	6.950927
18	-0.4	8.754970
19	0.0	5.231136
20	0.1	3.738897
21	0.0	5.570037
22	0.0	5.978180

In [98]:
```
t2corr.corr()
```

Out[98]:

	Unemploymentrate	GDP per capita growth
Unemploymentrate	1.000000	-0.288693
GDP per capita growth	-0.288693	1.000000

In [99]:
```
tcorr=t[['Unemploymentrate','GDPgrowth','Year']]
m1=tcorr['GDPgrowth'].max()
m2=tcorr['Unemploymentrate'].max()
m1
```

Out[99]:
```
10.2599629890244
```

In [100…
```
tcorr
```

Out[100…

	Unemploymentrate	GDPgrowth	Year
0	-0.1	5.482396	1992

	Unemploymentrate	GDPgrowth	Year
1	0.1	4.750776	1993
2	-0.6	6.658924	1994
3	0.3	7.574492	1995
4	0.0	7.549522	1996
5	0.2	4.049821	1997
6	-0.1	6.184416	1998
7	0.3	8.845756	1999
8	-0.1	3.840991	2000
9	-0.3	4.823966	2001
10	0.3	3.803975	2002
11	-0.4	7.860381	2003
12	0.0	7.922937	2004
13	0.5	9.284832	2005
14	-0.1	9.263959	2006
15	-0.6	9.801360	2007
16	0.4	3.890957	2008
17	-0.2	8.479787	2009
18	-0.4	10.259963	2010
19	0.0	6.638353	2011
20	0.1	5.081418	2012
21	0.0	6.899217	2013
22	0.0	7.286253	2014

In [101…

```
tcorr.corr()
```

Out[101…

	Unemploymentrate	GDPgrowth	Year
Unemploymentrate	1.000000	-0.296678	-0.022635
GDPgrowth	-0.296678	1.000000	0.286218
Year	-0.022635	0.286218	1.000000

In [102…

```
tcorr=t[['Value_x','GDPgrowth','Year']]
tcorr
```

Out[102…

	Value_x	GDPgrowth	Year
0	4.2	5.482396	1992
1	4.3	4.750776	1993
2	3.7	6.658924	1994
3	4.0	7.574492	1995

	Value_x	GDPgrowth	Year
4	4.0	7.549522	1996
5	4.2	4.049821	1997
6	4.1	6.184416	1998
7	4.4	8.845756	1999
8	4.3	3.840991	2000
9	4.0	4.823966	2001
10	4.3	3.803975	2002
11	3.9	7.860381	2003
12	3.9	7.922937	2004
13	4.4	9.284832	2005
14	4.3	9.263959	2006
15	3.7	9.801360	2007
16	4.1	3.890957	2008
17	3.9	8.479787	2009
18	3.5	10.259963	2010
19	3.5	6.638353	2011
20	3.6	5.081418	2012
21	3.6	6.899217	2013
22	3.6	7.286253	2014

In [103…

```
mv=tcorr['Value_x'].max()
tcorr
```

Out[103…

	Value_x	GDPgrowth	Year
0	4.2	5.482396	1992
1	4.3	4.750776	1993
2	3.7	6.658924	1994
3	4.0	7.574492	1995
4	4.0	7.549522	1996
5	4.2	4.049821	1997
6	4.1	6.184416	1998
7	4.4	8.845756	1999
8	4.3	3.840991	2000
9	4.0	4.823966	2001
10	4.3	3.803975	2002
11	3.9	7.860381	2003
12	3.9	7.922937	2004
13	4.4	9.284832	2005

	Value_x	GDPgrowth	Year
14	4.3	9.263959	2006
15	3.7	9.801360	2007
16	4.1	3.890957	2008
17	3.9	8.479787	2009
18	3.5	10.259963	2010
19	3.5	6.638353	2011
20	3.6	5.081418	2012
21	3.6	6.899217	2013
22	3.6	7.286253	2014

In [104…

```
#using Plot to see wheather there is a correlation
plt.figure(figsize=(15,8))
plt.plot(tcorr['Year'].values,tcorr['Value_x'].values,'-.bo',label='Unemploym
plt.plot(tcorr['Year'].values,tcorr['GDPgrowth'].values,'-.ro',label='GDP gro
plt.grid(True)
plt.legend()
plt.ylabel('Unemployment rate')
plt.xlabel('GDP growth (annual %)')
plt.title('Unemployment rate and GDP growth (annual %) over years')
plt.axis([1990,2015,0,20])
```

Out[104… (1990.0, 2015.0, 0.0, 20.0)