Brent Oil Prices

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```
install.packages("tidyr")
```

```
## Installing package into '/home/germano/R/x86_64-pc-linux-gnu-library/3.4'
## (as 'lib' is unspecified)
```

```
install.packages("ggplot2")
```

```
## Installing package into '/home/germano/R/x86_64-pc-linux-gnu-library/3.4'
## (as 'lib' is unspecified)
```

```
install.packages("dplyr")
```

```
## Installing package into '/home/germano/R/x86_64-pc-linux-gnu-library/3.4'
## (as 'lib' is unspecified)
```

```
install.packages("lubridate")
```

```
## Installing package into '/home/germano/R/x86_64-pc-linux-gnu-library/3.4'
## (as 'lib' is unspecified)
```

R Markdown

This is an R Markdown document. Markdown is a simple formatting syntax for authoring HTML, PDF, and MS Word documents. For more details on using R Markdown see http://rmarkdown.rstudio.com.

When you click the **Knit** button a document will be generated that includes both content as well as the output of any embedded R code chunks within the document. You can embed an R code chunk like this:

```
dtset_path ="https://raw.githubusercontent.com/gbertoncello/Brent-Oil-Prices-Analysis/master/brent-annua
brent_oil_prices <- read.csv(dtset_path,
                     header = TRUE,
                     sep = ",", dec = ".",
                     stringsAsFactors = FALSE)
names(brent_oil_prices) <- c("Date","Price")
head(brent_oil_prices)
```

```
##         Date Price
## 1 1987-06-30 18.53
## 2 1988-06-30 14.91
## 3 1989-06-30 18.23
## 4 1990-06-30 23.76
## 5 1991-06-30 20.04
## 6 1992-06-30 19.32
```

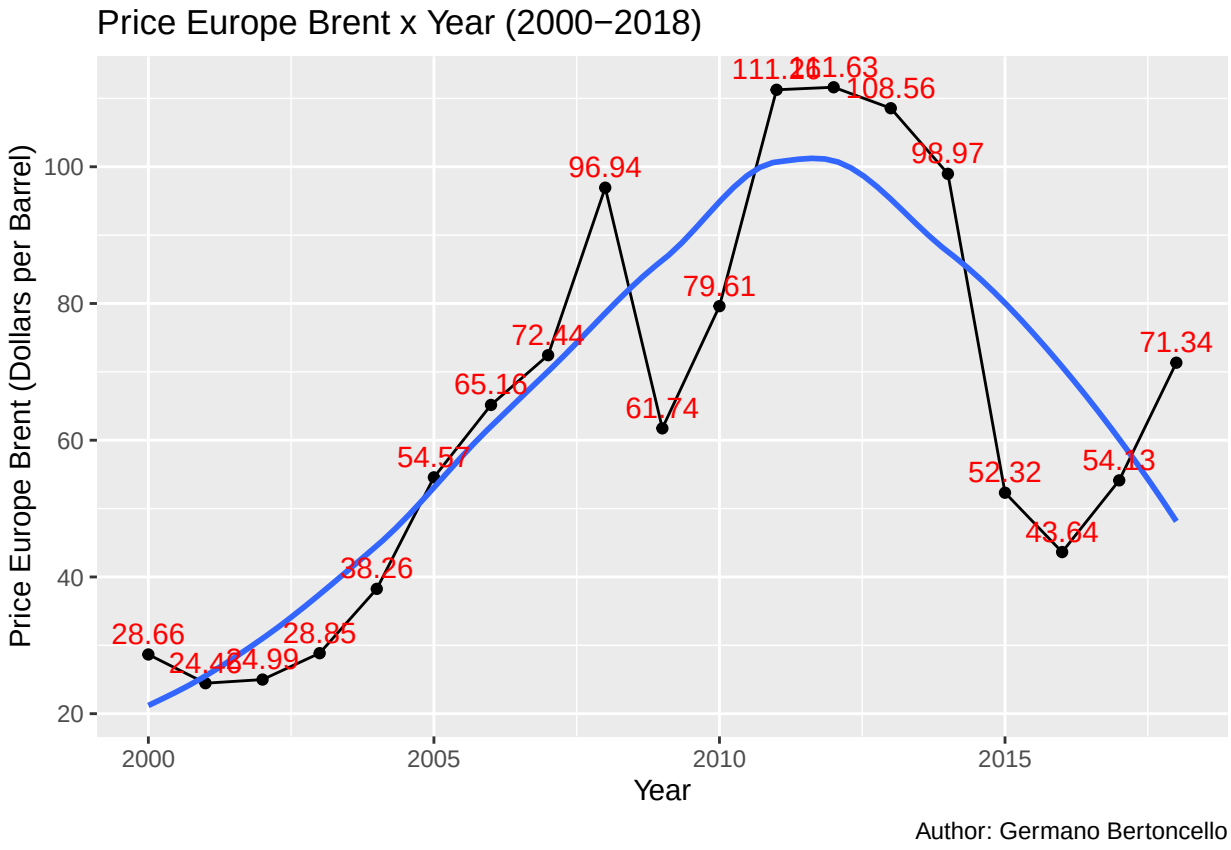
```
library(ggplot2)
library(dplyr)
```

```
##
## Attaching package: 'dplyr'
```

```
## The following objects are masked from 'package:stats':
##
##     filter, lag
```

```
## The following objects are masked from 'package:base':
##
##     intersect, setdiff, setequal, union
```

```
#Price available on June 30th of each year (1987-06-30,1988-06-30,...)
 Year_f<-substring(brent_oil_prices$Date,1,4)
 Year = as.integer(Year_f)
 price_by_year = cbind(brent_oil_prices,Year)
 price_by_year %>%
  group_by(Price) %>%
  filter(Year > "1999") %>%
  ggplot(aes(Year,Price,group = 1)) +
  geom_line() +
  geom_point() +
  geom_smooth(method = "loess", se = FALSE) +
 geom_text(aes(label = Price), vjust = -0.5, color = "red") +
    labs(x = "Year",
       y = "Price Europe Brent (Dollars per Barrel)",
       title = "Price Europe Brent x Year (2000-2018)",
       caption = "Author: Germano Bertoncello")
```

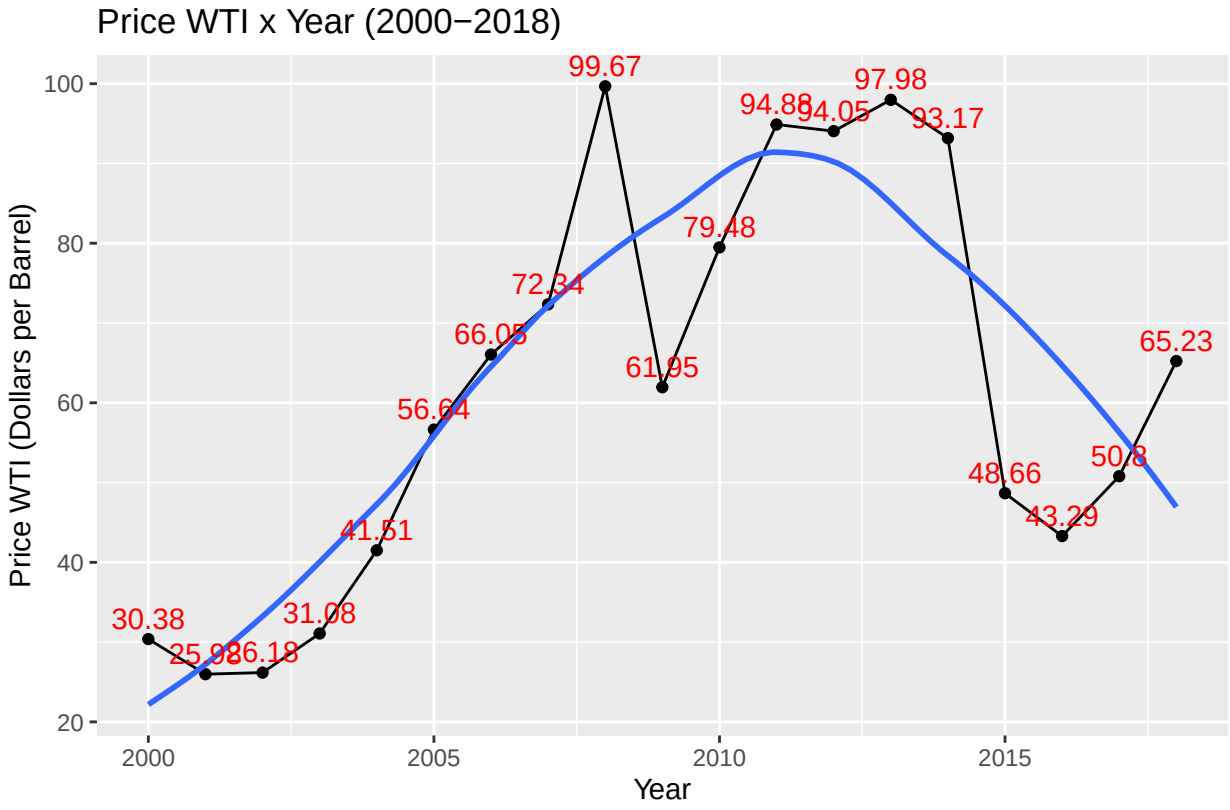



```
dtset_path_wti ="https://raw.githubusercontent.com/gbertoncello/Brent-Oil-Prices-Analysis/master/wti-an
wti_oil_prices <- read.csv(dtset_path_wti,
                   header = TRUE,
```

```
                    sep = ",", dec = ".",
                    stringsAsFactors = FALSE)
names(wti_oil_prices) <- c("WDate","WPrice")
head(wti_oil_prices)
```

```
##        WDate WPrice
## 1 1986-06-30  15.05
## 2 1987-06-30  19.20
## 3 1988-06-30  15.97
## 4 1989-06-30  19.64
## 5 1990-06-30  24.53
## 6 1991-06-30  21.54
```

```
#Price available on June 30th of each year (1987-06-30,1988-06-30,...)
 WYear_f<-substring(wti_oil_prices$WDate,1,4)
 WYear = as.integer(WYear_f)
 Wprice_by_year = cbind(wti_oil_prices,WYear)
 Wprice_by_year %>%
  group_by(WPrice) %>%
  filter(WYear > "1999") %>%
  ggplot(aes(WYear,WPrice,group = 1)) +
  geom_line() +
  geom_point() +
  geom_smooth(method = "loess", se = FALSE) +
  geom_text(aes(label = WPrice), vjust = -0.5, color = "red") +
  labs(x = "Year",
       y = "Price WTI (Dollars per Barrel)",
       title = "Price WTI x Year (2000-2018)",
       caption = "Author: Germano Bertoncello")
```



Author: Germano Bertoncello

```
price_by_year
```

```
##          Date  Price Year
## 1  1987-06-30  18.53 1987
## 2  1988-06-30  14.91 1988
## 3  1989-06-30  18.23 1989
## 4  1990-06-30  23.76 1990
## 5  1991-06-30  20.04 1991
## 6  1992-06-30  19.32 1992
## 7  1993-06-30  17.01 1993
## 8  1994-06-30  15.86 1994
## 9  1995-06-30  17.02 1995
## 10 1996-06-30  20.64 1996
## 11 1997-06-30  19.11 1997
## 12 1998-06-30  12.76 1998
## 13 1999-06-30  17.90 1999
## 14 2000-06-30  28.66 2000
## 15 2001-06-30  24.46 2001
## 16 2002-06-30  24.99 2002
## 17 2003-06-30  28.85 2003
## 18 2004-06-30  38.26 2004
## 19 2005-06-30  54.57 2005
## 20 2006-06-30  65.16 2006
## 21 2007-06-30  72.44 2007
## 22 2008-06-30  96.94 2008
## 23 2009-06-30  61.74 2009
## 24 2010-06-30  79.61 2010
```

```
## 25 2011-06-30 111.26 2011
## 26 2012-06-30 111.63 2012
## 27 2013-06-30 108.56 2013
## 28 2014-06-30  98.97 2014
## 29 2015-06-30  52.32 2015
## 30 2016-06-30  43.64 2016
## 31 2017-06-30  54.13 2017
## 32 2018-06-30  71.34 2018
```

```
Wprice_by_year <- Wprice_by_year[-c(1),]
Wprice_by_year
```

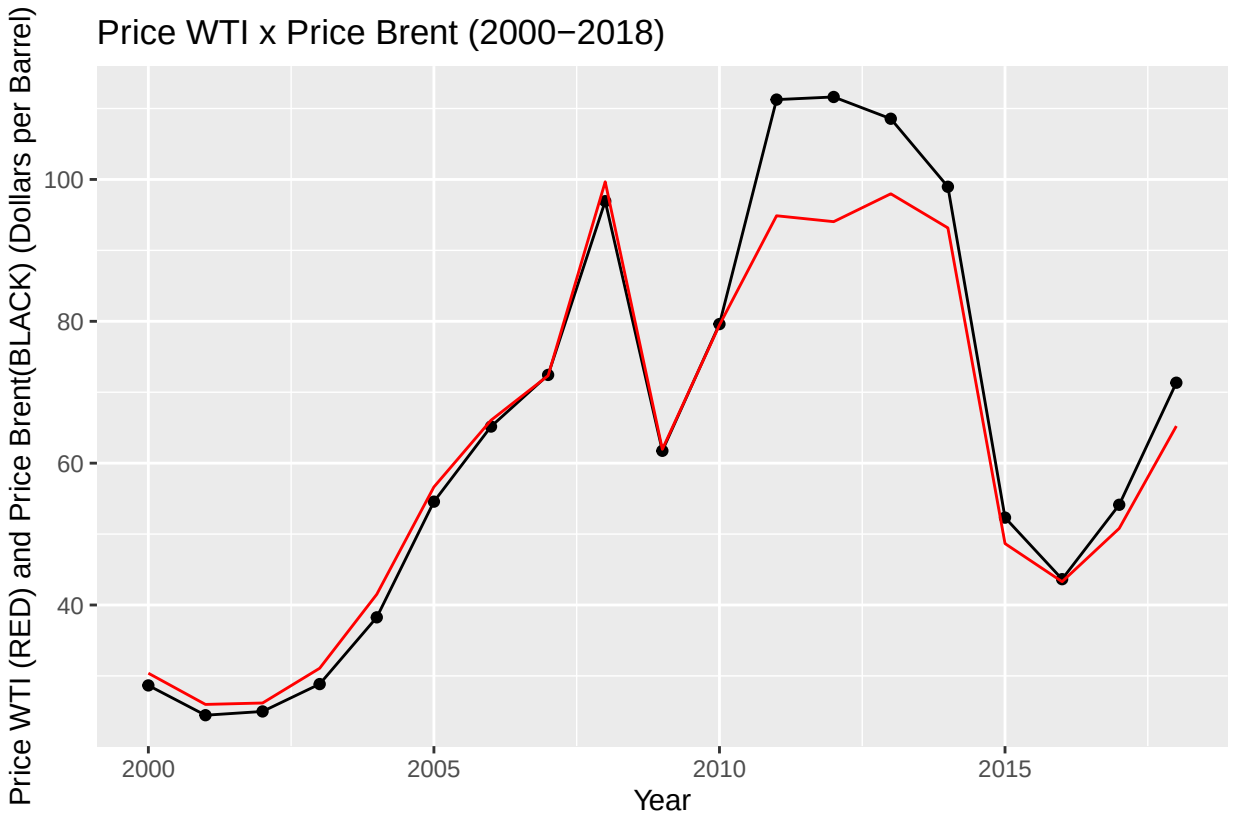
```
##         WDate WPrice WYear
## 2  1987-06-30  19.20  1987
## 3  1988-06-30  15.97  1988
## 4  1989-06-30  19.64  1989
## 5  1990-06-30  24.53  1990
## 6  1991-06-30  21.54  1991
## 7  1992-06-30  20.58  1992
## 8  1993-06-30  18.43  1993
## 9  1994-06-30  17.20  1994
## 10 1995-06-30  18.43  1995
## 11 1996-06-30  22.12  1996
## 12 1997-06-30  20.61  1997
## 13 1998-06-30  14.42  1998
## 14 1999-06-30  19.34  1999
## 15 2000-06-30  30.38  2000
## 16 2001-06-30  25.98  2001
## 17 2002-06-30  26.18  2002
## 18 2003-06-30  31.08  2003
## 19 2004-06-30  41.51  2004
## 20 2005-06-30  56.64  2005
## 21 2006-06-30  66.05  2006
## 22 2007-06-30  72.34  2007
## 23 2008-06-30  99.67  2008
## 24 2009-06-30  61.95  2009
## 25 2010-06-30  79.48  2010
## 26 2011-06-30  94.88  2011
## 27 2012-06-30  94.05  2012
## 28 2013-06-30  97.98  2013
## 29 2014-06-30  93.17  2014
## 30 2015-06-30  48.66  2015
## 31 2016-06-30  43.29  2016
## 32 2017-06-30  50.80  2017
## 33 2018-06-30  65.23  2018
```

```
Merged_Oil_Data = cbind(price_by_year,Wprice_by_year)
Merged_Oil_Data
```

```
##          Date  Price Year      WDate WPrice WYear
## 2  1987-06-30  18.53 1987 1987-06-30  19.20  1987
## 3  1988-06-30  14.91 1988 1988-06-30  15.97  1988
## 4  1989-06-30  18.23 1989 1989-06-30  19.64  1989
## 5  1990-06-30  23.76 1990 1990-06-30  24.53  1990
## 6  1991-06-30  20.04 1991 1991-06-30  21.54  1991
```

```
## 7  1992-06-30  19.32 1992 1992-06-30  20.58  1992
## 8  1993-06-30  17.01 1993 1993-06-30  18.43  1993
## 9  1994-06-30  15.86 1994 1994-06-30  17.20  1994
## 10 1995-06-30  17.02 1995 1995-06-30  18.43  1995
## 11 1996-06-30  20.64 1996 1996-06-30  22.12  1996
## 12 1997-06-30  19.11 1997 1997-06-30  20.61  1997
## 13 1998-06-30  12.76 1998 1998-06-30  14.42  1998
## 14 1999-06-30  17.90 1999 1999-06-30  19.34  1999
## 15 2000-06-30  28.66 2000 2000-06-30  30.38  2000
## 16 2001-06-30  24.46 2001 2001-06-30  25.98  2001
## 17 2002-06-30  24.99 2002 2002-06-30  26.18  2002
## 18 2003-06-30  28.85 2003 2003-06-30  31.08  2003
## 19 2004-06-30  38.26 2004 2004-06-30  41.51  2004
## 20 2005-06-30  54.57 2005 2005-06-30  56.64  2005
## 21 2006-06-30  65.16 2006 2006-06-30  66.05  2006
## 22 2007-06-30  72.44 2007 2007-06-30  72.34  2007
## 23 2008-06-30  96.94 2008 2008-06-30  99.67  2008
## 24 2009-06-30  61.74 2009 2009-06-30  61.95  2009
## 25 2010-06-30  79.61 2010 2010-06-30  79.48  2010
## 26 2011-06-30 111.26 2011 2011-06-30  94.88  2011
## 27 2012-06-30 111.63 2012 2012-06-30  94.05  2012
## 28 2013-06-30 108.56 2013 2013-06-30  97.98  2013
## 29 2014-06-30  98.97 2014 2014-06-30  93.17  2014
## 30 2015-06-30  52.32 2015 2015-06-30  48.66  2015
## 31 2016-06-30  43.64 2016 2016-06-30  43.29  2016
## 32 2017-06-30  54.13 2017 2017-06-30  50.80  2017
## 33 2018-06-30  71.34 2018 2018-06-30  65.23  2018
```

```
Merged_Oil_Data %>%
  group_by(Price) %>%
  filter(Year > "1999") %>%
  ggplot(aes(Year,Price,group = 1)) +
  geom_line() +
  geom_point() +
  geom_line(aes(y = WPrice), color = "red") +
  labs(x = "Year",
       y = "Price WTI (RED) and Price Brent(BLACK) (Dollars per Barrel)",
       title = "Price WTI x Price Brent (2000-2018)",
       caption = "Author: Germano Bertoncello")
```



Author: Germano Bertoncello

```
dtset_path_daily_ ="https://raw.githubusercontent.com/gbertoncello/Brent-Oil-Prices-Analysis/master/bre
brent_oil_prices_daily <- read.csv(dtset_path_daily_,
                    header = TRUE,
                    sep = ",", dec = ".",
                    stringsAsFactors = FALSE)
names(brent_oil_prices_daily) <- c("Date","Price")
head(brent_oil_prices_daily)
```

```
##         Date Price
## 1 1987-05-20 18.63
## 2 1987-05-21 18.45
## 3 1987-05-22 18.55
## 4 1987-05-25 18.60
## 5 1987-05-26 18.63
## 6 1987-05-27 18.60
```

```
library(dplyr)
library(lubridate)
```

```
##
## Attaching package: 'lubridate'
```

```
## The following object is masked from 'package:base':
##
##     date
```

```
mean_price_by_year <-brent_oil_prices_daily %>%
  mutate(date = year(Date)) %>%
```

```
  group_by(date) %>%
  summarize(mean_prices = mean(Price))
mean_price_by_year
```

```
## # A tibble: 33 x 2
##     date mean_prices
##    <dbl>       <dbl>
##  1  1987        18.5
##  2  1988        14.9
##  3  1989        18.2
##  4  1990        23.8
##  5  1991        20.0
##  6  1992        19.3
##  7  1993        17.0
##  8  1994        15.9
##  9  1995        17.0
## 10  1996        20.6
## # ... with 23 more rows
```

```
mean_prices_by_month <-brent_oil_prices_daily %>%
  mutate(date = month(Date)) %>%
  group_by(date) %>%
  summarize(mean_prices = mean(Price))
mean_prices_by_month
```

```
## # A tibble: 12 x 2
##     date mean_prices
##    <dbl>       <dbl>
##  1     1        44.0
##  2     2        44.6
##  3     3        46.0
##  4     4        47.6
##  5     5        48.2
##  6     6        47.0
##  7     7        47.5
##  8     8        48.0
##  9     9        47.2
## 10    10        47.3
## 11    11        44.9
## 12    12        43.8
```

```
dtset_path_daily_wti ="https://raw.githubusercontent.com/gbertoncello/Brent-Oil-Prices-Analysis/master/
wti_oil_prices_daily <- read.csv(dtset_path_daily_wti,
                    header = TRUE,
                    sep = ",", dec = ".",
                    stringsAsFactors = FALSE)
names(wti_oil_prices_daily) <- c("Date","Price")
head(wti_oil_prices_daily)
```

```
##         Date Price
## 1 1986-01-02 25.56
## 2 1986-01-03 26.00
## 3 1986-01-06 26.53
## 4 1986-01-07 25.85
## 5 1986-01-08 25.87
```

```
## 6 1986-01-09 26.03
```

```
Wmean_price_by_year <-wti_oil_prices_daily %>%
  mutate(date = year(Date)) %>%
  group_by(date) %>%
  summarize(mean_prices = mean(Price))
Wmean_price_by_year
```

```
## # A tibble: 34 x 2
##     date mean_prices
##    <dbl>       <dbl>
##  1  1986        15.0
##  2  1987        19.2
##  3  1988        16.0
##  4  1989        19.6
##  5  1990        24.5
##  6  1991        21.5
##  7  1992        20.6
##  8  1993        18.4
##  9  1994        17.2
## 10  1995        18.4
## # ... with 24 more rows
```

```
Wmean_prices_by_month <-wti_oil_prices_daily %>%
  mutate(date = month(Date)) %>%
  group_by(date) %>%
  summarize(mean_prices = mean(Price))
Wmean_prices_by_month
```

```
## # A tibble: 12 x 2
##     date mean_prices
##    <dbl>       <dbl>
##  1     1        41.5
##  2     2        41.7
##  3     3        43.2
##  4     4        44.9
##  5     5        45.3
##  6     6        45.2
##  7     7        45.8
##  8     8        45.7
##  9     9        45.3
## 10    10        45.1
## 11    11        43.5
## 12    12        41.7
```