# Annex

## R-Code

#NZCFTA

rm(list=ls())

# importing the required library

library(rio)

# reading data from all sheets

nzcfta <- import\_list("Universität/Bachelor/output.xlsx", rbind = TRUE)

#Taking out descriptions not needed for analysis

# delete headings

nzcfta\_frame=nzcfta[-c(1,2,3,14,15)]

#rename columns for future cleaning

colnames(nzcfta\_frame)[2]="test"

#deleting NA rows

dat = nzcfta\_frame[rowSums(is.na(nzcfta\_frame)) != ncol(nzcfta\_frame), ]

#deleting Baseyear-heading rows

dat1<-subset(dat, test!="2008")

#filling in zeros

dat1[dat1 == "free"] <- 0

dat1[is.na(dat1)] <- 0

nzcfta\_frame = dat1

#Renaming columns

colnames(nzcfta\_frame)[1]="Baserate"

colnames(nzcfta\_frame)[2]="Y + 1"

colnames(nzcfta\_frame)[3]="Y + 2"

colnames(nzcfta\_frame)[4]="Y + 3"

colnames(nzcfta\_frame)[5]="Y + 4"

colnames(nzcfta\_frame)[6]="Y + 5"

#plotting

nzcfta\_frame=sapply(nzcfta\_frame, as.numeric)

nzcfta\_frame=as.data.frame(nzcfta\_frame)

NZCFTA <- boxplot(nzcfta\_frame$Baserate, nzcfta\_frame$`Y + 1`, nzcfta\_frame$`Y + 2`, nzcfta\_frame$`Y + 3`, nzcfta\_frame$`Y + 4`, nzcfta\_frame$`Y + 5`,

                  names = c("Baserate", "Y + 1","Y + 2","Y + 3", "Y + 4", "Y + 5"), ylab = "Tariffs in %", xlab = "Tariff development from baseyear until 5th year of implementation",

                  main = "NZCFTA")

# ChAFTA

# importing the required library

library(readxl)

#fta einlesen

chafta\_schedule\_tariff <- read\_excel("~/Universität/Bachelor/chafta-explanatory-schedule-of-chinese-tariff-commitments-non-official(1).xlsx")

chafta\_frame <- chafta\_schedule\_tariff

#prepare data

chafta\_frame=chafta\_frame[-c(1,2,3),]

chafta\_frame=chafta\_frame[-c(1,2,4)]

cdata = chafta\_frame[rowSums(is.na(chafta\_frame)) != ncol(chafta\_frame), ]

cdata = as.data.frame(cdata)

cdata[is.na(cdata)] <- 0

chafta\_frame =cdata

#rename columns

colnames(chafta\_frame)[1]="Baserate"

colnames(chafta\_frame)[2]="Y + 1"

colnames(chafta\_frame)[3]="Y + 2"

colnames(chafta\_frame)[4]="Y + 3"

colnames(chafta\_frame)[5]="Y + 4"

colnames(chafta\_frame)[6]="Y + 5"

#plotting

chafta\_frame=sapply(chafta\_frame, as.numeric)

chafta\_frame=as.data.frame(chafta\_frame)

ChAFTA <- boxplot(chafta\_frame$Baserate, chafta\_frame$`Y + 1`, chafta\_frame$`Y + 2`, chafta\_frame$`Y + 3`, chafta\_frame$`Y + 4`,chafta\_frame$`Y + 5`,

        names = c("Baserate", "Y + 1","Y + 2","Y + 3", "Y + 4", "Y + 5"), ylab = "Tariffs in %", xlab = "Tariff development from baseyear until 5th year of implementation",

        main = "ChAFTA")

#RCEP

#importing required library

library(readxl)

# RCEP ASEAN

#fta einlesen

rcep\_asean <- read\_excel("~/Universität/Bachelor/recp-schedule-of-china-for-asean.xls")

ra\_frame <- rcep\_asean

#prepare data

ra\_frame = ra\_frame[-c(1,2,3),]

ra\_frame = ra\_frame[-c(1,2)]

ra\_frame=ra\_frame[rowSums(is.na(ra\_frame)) != ncol(ra\_frame), ]

#rename columns

colnames(ra\_frame)[1]="Baserate"

colnames(ra\_frame)[2]="Y + 1"

colnames(ra\_frame)[3]="Y + 2"

colnames(ra\_frame)[4]="Y + 3"

colnames(ra\_frame)[5]="Y + 4"

colnames(ra\_frame)[6]="Y + 5"

ra\_frame=sapply(ra\_frame, as.numeric)

ra\_frame=as.data.frame(ra\_frame)

#RCEP Australia

#fta einlesen

rcep\_australia <- read\_excel("~/Universität/Bachelor/recp-schedule-of-china-for-australia.xls",

                             col\_names = FALSE)

raus\_frame <- rcep\_australia

#prepare data

raus\_frame=raus\_frame[-c(1,2,3,4),]

raus\_frame=raus\_frame[-c(1,2)]

raus\_frame=raus\_frame[rowSums(is.na(raus\_frame)) != ncol(raus\_frame), ]

#rename columns

colnames(raus\_frame)[1]="Baserate"

colnames(raus\_frame)[2]="Y + 1"

colnames(raus\_frame)[3]="Y + 2"

colnames(raus\_frame)[4]="Y + 3"

colnames(raus\_frame)[5]="Y + 4"

colnames(raus\_frame)[6]="Y + 5"

raus\_frame=sapply(raus\_frame, as.numeric)

raus\_frame=as.data.frame(raus\_frame)

#RCEP Japan

#fta einlesen

rcep\_japan <- read\_excel("~/Universität/Bachelor/recp-schedule-of-china-for-japan.xls")

rja\_frame <- rcep\_japan

#prepare data

rja\_frame=rja\_frame[-c(1,2,3),]

rja\_frame=rja\_frame[-c(1,2)]

rja\_frame=rja\_frame[rowSums(is.na(rja\_frame)) != ncol(rja\_frame), ]

#rename columns

colnames(rja\_frame)[1]="Baserate"

colnames(rja\_frame)[2]="Y + 1"

colnames(rja\_frame)[3]="Y + 2"

colnames(rja\_frame)[4]="Y + 3"

colnames(rja\_frame)[5]="Y + 4"

colnames(rja\_frame)[6]="Y + 5"

rja\_frame=sapply(rja\_frame, as.numeric)

rja\_frame=as.data.frame(rja\_frame)

#RCEP Korea

#fta einlesen

rcep\_korea <- read\_excel("~/Universität/Bachelor/recp-schedule-of-china-for-korea.xls")

rko\_frame <- rcep\_korea

#prepare data

rko\_frame=rko\_frame[-c(1,2,3),]

rko\_frame=rko\_frame[-c(1,2)]

rko\_frame=rko\_frame[rowSums(is.na(rko\_frame)) != ncol(rko\_frame), ]

#rename columns

colnames(rko\_frame)[1]="Baserate"

colnames(rko\_frame)[2]="Y + 1"

colnames(rko\_frame)[3]="Y + 2"

colnames(rko\_frame)[4]="Y + 3"

colnames(rko\_frame)[5]="Y + 4"

colnames(rko\_frame)[6]="Y + 5"

rko\_frame=sapply(rko\_frame, as.numeric)

rko\_frame=as.data.frame(rko\_frame)

#RCEP New Zealand

#fta einlesen

rcep\_newzealand <- recp\_schedule\_of\_china\_for\_nz <- read\_excel("~/Universität/Bachelor/recp-schedule-of-china-for-nz.xls")

rnz\_frame <- rcep\_newzealand

#prepare data

rnz\_frame=rnz\_frame[-c(1,2,3),]

rnz\_frame=rnz\_frame[-c(1,2)]

rnz\_frame=rnz\_frame[rowSums(is.na(rnz\_frame)) != ncol(rnz\_frame), ]

#rename columns

colnames(rnz\_frame)[1]="Baserate"

colnames(rnz\_frame)[2]="Y + 1"

colnames(rnz\_frame)[3]="Y + 2"

colnames(rnz\_frame)[4]="Y + 3"

colnames(rnz\_frame)[5]="Y + 4"

colnames(rnz\_frame)[6]="Y + 5"

rnz\_frame=sapply(rnz\_frame, as.numeric)

rnz\_frame=as.data.frame(rnz\_frame)

#Boxplots

par(mfrow = c(2,3))

#importing required library

RCEP\_ASEAN <- boxplot(ra\_frame$Baserate\*100, ra\_frame$`Y + 1`\*100, ra\_frame$`Y + 2`\*100, ra\_frame$`Y + 3`\*100, ra\_frame$`Y + 4`\*100,ra\_frame$`Y + 5`\*100,

                          names = c("Baserate", "Y + 1","Y + 2","Y + 3", "Y + 4", "Y + 5"), ylab = "Tariffs in %",

                      main = "RCEP ASEAN")

RCEP\_AUSTRALIA <- boxplot(raus\_frame$Baserate\*100, raus\_frame$`Y + 1`\*100, raus\_frame$`Y + 2`\*100, raus\_frame$`Y + 3`\*100, raus\_frame$`Y + 4`\*100,raus\_frame$`Y + 5`\*100,

                          names = c("Baserate", "Y + 1","Y + 2","Y + 3", "Y + 4", "Y + 5"), ylab = "Tariffs in %",

                          main = "RCEP AUSTRLIA")

RCEP\_JAPAN <- boxplot(rja\_frame$Baserate\* 100 , rja\_frame$`Y + 1`\* 100 , rja\_frame$`Y + 2`\* 100 , rja\_frame$`Y + 3`\* 100 , rja\_frame$`Y + 4`\* 100 ,rja\_frame$`Y + 5`\* 100,

                      names = c("Baserate", "Y + 1","Y + 2","Y + 3", "Y + 4", "Y + 5"), ylab = "Tariffs in %",

                      main = "RCEP JAPAN")

RCEP\_KOREA <- boxplot(rko\_frame$Baserate\* 100 , rko\_frame$`Y + 1`\* 100 , rko\_frame$`Y + 2`\* 100 , rko\_frame$`Y + 3`\* 100 , rko\_frame$`Y + 4`\* 100 ,rko\_frame$`Y + 5`\* 100 ,

                      names = c("Baserate", "Y + 1","Y + 2","Y + 3", "Y + 4", "Y + 5"), ylab = "Tariffs in %",

                      main = "RCEP KOREA")

RCEP\_NEWZEALAND <- boxplot(rnz\_frame$Baserate\* 100 , rnz\_frame$`Y + 1`\* 100 , rnz\_frame$`Y + 2`\* 100 , rnz\_frame$`Y + 3`\* 100 , rnz\_frame$`Y + 4`\* 100 ,rnz\_frame$`Y + 5`\* 100 ,

                           names = c("Baserate", "Y + 1","Y + 2","Y + 3", "Y + 4", "Y + 5"), ylab = "Tariffs in %",

                           main = "RCEP NEW ZEALAND")

#Main Table

#NZCFTA

nz1 = mean(nzcfta\_frame[,1],na.rm = TRUE)

nz2 = mean(nzcfta\_frame[,2],na.rm = TRUE)

nz3 = mean(nzcfta\_frame[,3],na.rm = TRUE)

nz4 = mean(nzcfta\_frame[,4],na.rm = TRUE)

nz5 = mean(nzcfta\_frame[,5],na.rm = TRUE)

nz6 = mean(nzcfta\_frame[,6],na.rm = TRUE)

NROW = rbind(nz1, nz2, nz3, nz4,nz5, nz6)

#ChAFTA

c1 = mean(chafta\_frame[,1],na.rm = TRUE)/100

c2 = mean(chafta\_frame[,2],na.rm = TRUE)/100

c3 = mean(chafta\_frame[,3],na.rm = TRUE)/100

c4 = mean(chafta\_frame[,4],na.rm = TRUE)/100

c5 = mean(chafta\_frame[,5],na.rm = TRUE)/100

c6 = mean(chafta\_frame[,6],na.rm = TRUE)/100

CROW = rbind(c1, c2, c3, c4, c5, c6)

#RCEP

#RCEP ASEAN

as1 = mean(ra\_frame[,1],na.rm = TRUE)

as2 = mean(ra\_frame[,2],na.rm = TRUE)

as3 = mean(ra\_frame[,3],na.rm = TRUE)

as4 = mean(ra\_frame[,4],na.rm = TRUE)

as5 = mean(ra\_frame[,5],na.rm = TRUE)

as6 = mean(ra\_frame[,6],na.rm = TRUE)

ASROW = rbind(as1, as2, as3, as4, as5, as6)

#RCEP AUSTRLIA

au1 = mean(raus\_frame[,1],na.rm = TRUE)

au2 = mean(raus\_frame[,2],na.rm = TRUE)

au3 = mean(raus\_frame[,3],na.rm = TRUE)

au4 = mean(raus\_frame[,4],na.rm = TRUE)

au5 = mean(raus\_frame[,5],na.rm = TRUE)

au6 = mean(raus\_frame[,6],na.rm = TRUE)

AUROW = rbind(au1, au2, au3, au4, au5, au6)

#RCEP JAPAN

ja1 = mean(rja\_frame[,1],na.rm = TRUE)

ja2 = mean(rja\_frame[,2],na.rm = TRUE)

ja3 = mean(rja\_frame[,3],na.rm = TRUE)

ja4 = mean(rja\_frame[,4],na.rm = TRUE)

ja5 = mean(rja\_frame[,5],na.rm = TRUE)

ja6 = mean(rja\_frame[,6],na.rm = TRUE)

JAROW = rbind(ja1, ja2, ja3, ja4, ja5, ja6)

#RCEP KOREA

ko1 = mean(rko\_frame[,1],na.rm = TRUE)

ko2 = mean(rko\_frame[,2],na.rm = TRUE)

ko3 = mean(rko\_frame[,3],na.rm = TRUE)

ko4 = mean(rko\_frame[,4],na.rm = TRUE)

ko5 = mean(rko\_frame[,5],na.rm = TRUE)

ko6 = mean(rko\_frame[,6],na.rm = TRUE)

KOROW = rbind(ko1, ko2, ko3, ko4, ko5, ko6)

#RCEP NEW ZEALAND

n1 = mean(rnz\_frame[,1],na.rm = TRUE)

n2 = mean(rnz\_frame[,2],na.rm = TRUE)

n3 = mean(rnz\_frame[,3],na.rm = TRUE)

n4 = mean(rnz\_frame[,4],na.rm = TRUE)

n5 = mean(rnz\_frame[,5],na.rm = TRUE)

n6 = mean(rnz\_frame[,6],na.rm = TRUE)

NROW = rbind(n1, n2, n3, n4, n5, n6)

#Joining rows to data frame

tabledat = cbind(NROW, CROW, ASROW, AUROW, JAROW, KOROW, NROW)

tabledat = data.frame(tabledat)

tabledat = as.data.frame(t(tabledat))

colnames(tabledat)[1]="Baserate"

colnames(tabledat)[2]="Y + 1"

colnames(tabledat)[3]="Y + 2"

colnames(tabledat)[4]="Y + 3"

colnames(tabledat)[5]="Y + 4"

colnames(tabledat)[6]="Y + 5"

rownames(tabledat)[1]="NZCFTA"

rownames(tabledat)[2]="ChAFTA"

rownames(tabledat)[3]="RCEP ASEAN"

rownames(tabledat)[4]="RCEP AUSTRALIA"

rownames(tabledat)[5]="RCEP JAPAN"

rownames(tabledat)[6]="RCEP KOREA"

rownames(tabledat)[7]="RCEP NEW ZEALAND"

#Compute growth rates

tabledat = as.data.frame(t(tabledat))

#NZCFTA

GrowNZ <- as.data.frame(tabledat[1])

GrowNZ$Growth = with(GrowNZ, ave(tabledat[,1],

             FUN=function(x) c(NA, diff(x)/x[-length(x)]) ))

View(GrowNZ)

AverageNZ = mean(GrowNZ$Growth, na.rm=TRUE)

#ChAFTA

GrowC <- as.data.frame(tabledat[2])

GrowC$Growth[1] = NA

GrowC$Growth[2] = tabledat$ChAFTA[2]/tabledat$ChAFTA[1]-1

GrowC$Growth[3] = tabledat$ChAFTA[3]/tabledat$ChAFTA[2]-1

GrowC$Growth[4] = tabledat$ChAFTA[4]/tabledat$ChAFTA[3]-1

GrowC$Growth[5] = tabledat$ChAFTA[5]/tabledat$ChAFTA[4]-1

GrowC$Growth[6] = tabledat$ChAFTA[6]/tabledat$ChAFTA[5]-1

View(GrowC)

AverageC = mean(GrowC$Growth, na.rm=TRUE)

#RCEP ASEAN

GrowAS <- as.data.frame(tabledat[3])

GrowAS$Growth[1] = NA

GrowAS$Growth[2] = tabledat$`RCEP ASEAN`[2]/tabledat$`RCEP ASEAN`[1]-1

GrowAS$Growth[3] = tabledat$`RCEP ASEAN`[3]/tabledat$`RCEP ASEAN`[2]-1

GrowAS$Growth[4] = tabledat$`RCEP ASEAN`[4]/tabledat$`RCEP ASEAN`[3]-1

GrowAS$Growth[5] = tabledat$`RCEP ASEAN`[5]/tabledat$`RCEP ASEAN`[4]-1

GrowAS$Growth[6] = tabledat$`RCEP ASEAN`[6]/tabledat$`RCEP ASEAN`[5]-1

View(GrowAS)

AverageAS = mean(GrowAS$Growth, na.rm=TRUE)

#RCEP AUSTRALIA

GrowAU <- as.data.frame(tabledat[4])

GrowAU$Growth[1] = NA

GrowAU$Growth[2] = tabledat$`RCEP AUSTRALIA`[2]/tabledat$`RCEP AUSTRALIA`[1]-1

GrowAU$Growth[3] = tabledat$`RCEP AUSTRALIA`[3]/tabledat$`RCEP AUSTRALIA`[2]-1

GrowAU$Growth[4] = tabledat$`RCEP AUSTRALIA`[4]/tabledat$`RCEP AUSTRALIA`[3]-1

GrowAU$Growth[5] = tabledat$`RCEP AUSTRALIA`[5]/tabledat$`RCEP AUSTRALIA`[4]-1

GrowAU$Growth[6] = tabledat$`RCEP AUSTRALIA`[6]/tabledat$`RCEP AUSTRALIA`[5]-1

View(GrowAU)

AverageAU = mean(GrowAU$Growth, na.rm=TRUE)

#RCEP JAPAN

GrowJA <- as.data.frame(tabledat[5])

GrowJA$Growth[1] = NA

GrowJA$Growth[2] = tabledat$`RCEP JAPAN`[2]/tabledat$`RCEP JAPAN`[1]-1

GrowJA$Growth[3] = tabledat$`RCEP JAPAN`[3]/tabledat$`RCEP JAPAN`[2]-1

GrowJA$Growth[4] = tabledat$`RCEP JAPAN`[4]/tabledat$`RCEP JAPAN`[3]-1

GrowJA$Growth[5] = tabledat$`RCEP JAPAN`[5]/tabledat$`RCEP JAPAN`[4]-1

GrowJA$Growth[6] = tabledat$`RCEP JAPAN`[6]/tabledat$`RCEP JAPAN`[5]-1

View(GrowJA)

AverageJA = mean(GrowJA$Growth, na.rm=TRUE)

#RCEP KOREA

GrowKO <- as.data.frame(tabledat[6])

GrowKO$Growth[1] = NA

GrowKO$Growth[2] = tabledat$`RCEP KOREA`[2]/tabledat$`RCEP KOREA`[1]-1

GrowKO$Growth[3] = tabledat$`RCEP KOREA`[3]/tabledat$`RCEP KOREA`[2]-1

GrowKO$Growth[4] = tabledat$`RCEP KOREA`[4]/tabledat$`RCEP KOREA`[3]-1

GrowKO$Growth[5] = tabledat$`RCEP KOREA`[5]/tabledat$`RCEP KOREA`[4]-1

GrowKO$Growth[6] = tabledat$`RCEP KOREA`[6]/tabledat$`RCEP KOREA`[5]-1

View(GrowKO)

AverageKO = mean(GrowKO$Growth, na.rm=TRUE)

#NEW ZEALAND

GrowN <- as.data.frame(tabledat[7])

GrowN$Growth[1] = NA

GrowN$Growth[2] = tabledat$`RCEP NEW ZEALAND`[2]/tabledat$`RCEP NEW ZEALAND`[1]-1

GrowN$Growth[3] = tabledat$`RCEP NEW ZEALAND`[3]/tabledat$`RCEP NEW ZEALAND`[2]-1

GrowN$Growth[4] = tabledat$`RCEP NEW ZEALAND`[4]/tabledat$`RCEP NEW ZEALAND`[3]-1

GrowN$Growth[5] = tabledat$`RCEP NEW ZEALAND`[5]/tabledat$`RCEP NEW ZEALAND`[4]-1

GrowN$Growth[6] = tabledat$`RCEP NEW ZEALAND`[6]/tabledat$`RCEP NEW ZEALAND`[5]-1

View(GrowN)

AverageN = mean(GrowN$Growth, na.rm=TRUE)

tabledat = as.data.frame(t(tabledat))

tabledat$AverageGrowth = c (AverageNZ, AverageC,AverageAS,AverageAU,AverageJA,AverageKO,AverageN)

print(tabledat)

## Console