Growth Accounting

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Import Penn World Dataset

```
library(readxl)
penn_world <- read_excel("~/Documents/2017-18/ECON241/Final_Project/first_paper_assignment/Growth Accou
suppressMessages(library(dplyr))
dataset_1 <- penn_world %>%
  filter(country %in% c("United States", "Republic of Korea", "Japan")) %>%
  select(country,year,rgdpe,rgdpo,pop,emp,hc,ccon,cda,
         cgdpe,cgdpo,rgdpna,rkna,labsh,delta,csh_c,csh_i,csh_g,csh_x,csh_m,csh_r)
```

GDP per Worker and GDP per Capita

```
per_capita <- function(argument){
  outcome <- dataset_1 %>% na.omit() %>% filter(country == argument) %>%
    filter(year == max(year)) %>% group_by(country, year) %>%
    summarize(rgdpna_emp = rgdpna/emp, rgdpna_pc = rgdpna/pop)
  return(outcome)
}
gdp_per_capita <- lapply(c("Japan","Republic of Korea","United States"), per_capita) %>%
  bind_rows()
knitr::kable(gdp_per_capita)
```

country	year	rgdpna_emp	rgdpna_pc
Japan	2014	70729.18	36250.46
Republic of Korea	2014	66165.62	34539.55
United States	2014	111072.44	51620.79

Growth Accounting

```
growth_rate_func <- function(nation){
  subset <- dataset_1 %>% filter(country == nation) %>% na.omit() %>%
    mutate(gdpPercap = rgdpna/emp, capPercap = rkna/emp)
  output <- subset %>% group_by(country) %>%
    summarize(`Output GR`=
                ((gdpPercap[nrow(subset)]/gdpPercap[1])^(1/(year[nrow(subset)]-year[1]))-1)*100,
              `Physical Capital GR`=
                ((capPercap[nrow(subset)]/capPercap[1])^(1/(year[nrow(subset)]-year[1]))-1)*100,
              `Human Capital GR` =
                ((hc[nrow(subset)]/hc[1])^(1/(year[nrow(subset)]-year[1]))-1)*100,
              `Productivity GR` =
                `Output GR` - 1/3*`Physical Capital GR` - 2/3*`Human Capital GR`) %>%
    mutate(`Productivity's Share` =
```

```
            ((`Productivity GR`)/`Output GR`)*100,
          `Human Capital's Share` =
            ((2/3*`Human Capital GR`)/`Output GR`)*100,
          `Physical Capital's Share` =
            ((1/3*`Physical Capital GR`)/`Output GR`)*100)
  return(output)
}

growth_rate <- lapply(c("Republic of Korea","United States","Japan"),
                      growth_rate_func) %>% bind_rows()
knitr::kable(growth_rate[,1:5])
```

country	Output GR	Physical Capital GR	Human Capital GR	Productivity GR
Republic of Korea	4.424827	6.014121	1.1155308	1.6764322
United States	1.781490	1.699390	0.5726488	0.8332611
Japan	3.731064	7.627504	0.6828883	0.7333041

```
knitr::kable(growth_rate[,c(1,6:8)])
```

country	Productivity's Share	Human Capital's Share	Physical Capital's Share
Republic of Korea	37.88696	16.80715	45.30589
United States	46.77326	21.42958	31.79716
Japan	19.65402	12.20185	68.14413