Example R Markdown File ECON 370

Alex Marsh

6/3/2022

Make Example Script Into R Markdown File

Library Packages

```r
library(ggplot2)
library(latex2exp)
```

The reason I need these packages is because blah blah blah.

Global Parameters and Variables

```r
## ---- Set filepaths
ECON370 = "/Users/alexmarsh/Documents/School/Teaching/ECON370/" # set 370 dir
figdir  = paste0(ECON370,"Examples/")                           # set fig dir


LEGEND = FALSE


## ---- Create Shorter TeX function
TeXc = function(txt) TeX(txt,output = "character")


## ---- Set figure parameters
res    = 400   # set figure resolution
inch   = 4     # set figure width and height (ASSUMED SQUARE or w = h)
tabsz  = 4     # set configuration text size
equsz  = tabsz # set equation annotation text size
rmnsz  = 5     # set roman numeral annotation text size


## ---- Set Equation Annotation LaTeX
LHS     = "\\beta(\\alpha) "                      # set LHS of equ
RHS_Con = " \\frac{\\Delta \\Pi}{p (1-\\delta)}"  # set constant for equ
RHS_Sl  = "\\frac{ \\delta}{1- \\delta} \\; \\alpha" # set slope for equ
BForm   = paste0("$",LHS,"=",RHS_Con,"+",RHS_Sl,"$") # paste equ together
LineTeX = TeXc(BForm)                             # create equ LaTeX code


## ---- Set parameters For Plot
p_i   = 200  # set price
Delpi = 70   # set Delta Pi
delta = 0.2  # set delta
```

Calculate Values Needed For Plots

```r
## ---- Create Indifference Line Points
a  = Delpi/((1-delta)*p_i)  # set indifference equation intercept
b  = delta/(1-delta)        # set indifference equation slope
x1 = 0                      # set first x value
y1 = a+b*x1                 # set first y value
x2 = (1-a)/(1+b)            # set end x value
y2 = a+b*x2                 # set end y value

## ---- Create Target Group Area Data
PolyData = data.frame(
  Target = c(rep("Yes",3),rep("No",4)), # targeting group ids
  "x"    = c(0,0,x2,0,0,x2,1),          # x values
  "y"    = c(y1,1,y2,0,y1,y2,0)         # y values
)

PolyCols = alpha("#4B9CD3",c(0.875,0.125))
names(PolyCols) = c("Yes","No")
```

Create Plot

```r
## ---- Create Plot
TargetPlot = ggplot() +

  # Create 2D Simplex
  geom_segment(aes(x = 0, y = 1, xend = 1, yend = 0)) +
  geom_segment(aes(x = 0, y = 0, xend = 1, yend = 0)) +
  geom_segment(aes(x = 0, y = 0, xend = 0, yend = 1)) +

  # Create Dotted Line for Indifference Line
  geom_segment(aes(x=x1, y=y1, xend=x2, yend=y2), linetype="longdash") +

  # Create Shaded Polynimal Locations for Targeting Groups
  geom_polygon(data = PolyData,aes(x = x, y = y,fill=Target)) +
  scale_fill_manual(values=PolyCols) +

  # Add Equation Annotation to Plot
  annotate("text", label=LineTeX, x=0.75, y=0.62, parse=T, size=equsz)

TargetPlot = TargetPlot +

    # Add Targeting Annotations
    annotate("text",label="Target", x=0.15, y=0.65, size=equsz) +
    annotate("text",label="Don't Target", x=0.4, y=0.28, size=equsz)

  ## ---- Format Plot Theme To Be Blank
TargetPlot = TargetPlot +

  # Set Values of x and y axis ticks
    scale_x_continuous(breaks = seq(0,1,0.1), limits = c(0,1)) +
    scale_y_continuous(breaks = seq(0,1,0.1), limits = c(0,1)) +
    xlab(TeX("$\\alpha$")) + ylab(TeX("$\\beta$")) +

    # Format Plot to be Blank
```

```
    theme_minimal() +
    theme(panel.background = element_blank(),
        panel.grid.minor = element_blank(),
        panel.grid.major = element_blank(),
        axis.text.y = element_text(margin = margin(r = -0.25,unit="cm")),
        axis.text.x = element_text(margin = margin(t = -0.25,unit="cm")),
        legend.position = if(LEGEND) c(0.63,0.8) else "No"
  )
```

TargetPlot

$$\beta(\alpha) = \frac{\Delta\Pi}{p(1-\delta)} + \frac{\delta}{1-\delta}\, \alpha$$