Creative Destruction: Barriers to Growth and the Great Boston Fire of 1872

Kemar Gordon

12/10/2022

By Richard HORNBECK and Daniel Keniston

This paper analyzes the Great Boston Fire of 1872 in order to explore constraints on urban growth and how natural disasters such as a fire enables urban growth.

The empirical analysis uses a new plot-level data-set, covering all plots in the burned area and surrounding areas in 1867, 1871, 1872, 1873, 1882 and 1894.

In this section there is a set of codes to clean the Water Pipes data-set

Cleaning Code for Pipes Data

```
library(tidyverse)
library(readr)
WaterPipesBurned <- read_csv("Burned Pipes/WaterPipesBurned.csv")%>%
  rename_all(tolower) %>%
  mutate(burned=1)
WaterPipesUnburned <- read_csv("Burned Pipes/WaterPipesUnburned.csv")%>%
  rename_all(tolower) %>%
  mutate(burned=0)
rb1<-rbind(WaterPipesUnburned,WaterPipesBurned )
#%%%%%%%%%%%%%1853%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%
library(readr)
Pipes1853Burned <- read_csv("Burned Pipes/Pipes1853Burned.csv")%>%
  rename_all(tolower) %>%
  mutate(burned=1)
Pipes1853UnBurned <- read_csv("Burned Pipes/Pipes1853UnBurned.csv")%>%
  rename_all(tolower) %>%
  mutate(burned=0)
rb2<-rbind(Pipes1853UnBurned,Pipes1853Burned )%>%
  mutate(objectid = (oid_save+1)) %>%
  select(distpipew, mainpipew, objectid, length, burned)
Wp_data <- right_join(rb2, rb1, by = c("objectid", "burned"))%>%
  select(-shape_leng)%>%
  mutate(waterdate=as.character(waterdate))%>%
  mutate(w_pipe_in=as.character(w_pipe_in))%>%
  mutate(w_pipeleng=as.character(w_pipeleng))%>%
  mutate(w_comments = paste(waterdate,"/", w_pipe_in,"/", w_pipeleng, ";"))%>%
  mutate(waterdate=as.numeric(waterdate))%>%
  mutate(w_pipe_in=as.numeric(w_pipe_in))%>%
  mutate(w_pipeleng=as.numeric(w_pipeleng))%>%
```

```
  mutate(waterdate=1852)%>%
  mutate(w_pipe_in = distpipew)%>%
  mutate(w_pipe_in= ifelse(w_pipe_in==0," .",w_pipe_in))

#%%%%%%%%%%%%%1853%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%

DistToFire_Burned <- read_csv("Burned Pipes/DistToFire_Burned.csv")%>%
  rename_all(tolower) %>%
  select(-objectid)%>%
  rename(objectid=oid_save)%>%
  mutate(objectid=objectid+1)%>%
  select(objectid, near_dist, shape_length)%>%
  rename(dist_sl=shape_length)%>%
  mutate(burned=1)

Wp3_data <- right_join(DistToFire_Burned,Wp_data, by = c("objectid", "burned"))


DistToFire_Unburned <- read_csv("Burned Pipes/DistToFire_Unburned.csv")%>%
  rename_all(tolower) %>%
  select(-objectid)%>%
  rename(objectid=oid_save)%>%
  rename(near_distu=near_dist)%>%
  mutate(objectid=objectid+1)%>%
  select(objectid, near_distu, shape_length)%>%
  rename(dist_sl=shape_length)%>%
  mutate(burned=0)
Wp4_data <- full_join(DistToFire_Unburned,Wp3_data, by = c("objectid", "burned"))
```

In this section, table 1 was replicated from the paper. The observations were weighted by plot size.

```
library(tidyverse)
library(abind)
library(lmtest)
library(sandwich)
library(haven)
library(ggplot2)
library(stargazer)
library(olsrr)
set.seed(1234)
FireWorking <- read_dta("FAD/FireWorking.dta")
 close <-1338.965


 rdf1<-FireWorking%>%
  rename_all(tolower)%>%
  mutate(sample0=1)%>%
  mutate(sample1=ifelse(burned == 1 | distance < close,1,0))%>%
  mutate(sample2=ifelse(burned == 1 | distance >= close,1,0))%>%
  mutate(year_1872=year )%>%
  mutate(year_1872=ifelse(year==1872,1,0))%>%
  mutate(burned_1872 = year_1872*burned)
 #Creates different sub-samples as well as weighting the observations by plotsize
 rdf13<- filter(rdf1,(year == 1872 ) & sample0==1)%>%
```

```
  mutate(lnvalue_land_ft=lnvalue_land_ft*sqrt(plotsize))%>%
  mutate(lnvalue_building_ft=lnvalue_building_ft*sqrt(plotsize))%>%
  mutate(dist_to_cbd=dist_to_cbd*sqrt(plotsize))%>%
  mutate(burned_1867=burned_1867*sqrt(plotsize))%>%
  mutate(burned_1869=burned_1869*sqrt(plotsize))%>%
  mutate(burned_1871=burned_1871*sqrt(plotsize))%>%
  mutate(burned_1872=burned_1872*sqrt(plotsize))%>%
  mutate(year_1869=year_1869*sqrt(plotsize))%>%
  mutate(year_1871=year_1871*sqrt(plotsize))%>%
  mutate(year_1872=year_1872*sqrt(plotsize))%>%
  mutate(lnland_ft_n_1867_1869 =lnland_ft_n_1867_1869*sqrt(plotsize))%>%
  mutate(lnland_ft_blk_1867_1869=lnland_ft_blk_1867_1869*sqrt(plotsize))%>%
  mutate(lnland_ft_n_1867_1871=lnland_ft_n_1867_1871*sqrt(plotsize))%>%
  mutate(lnland_ft_blk_1867_1871=lnland_ft_blk_1867_1871*sqrt(plotsize))%>%
  mutate(lnland_ft_n_1867_1872=lnland_ft_n_1867_1872*sqrt(plotsize))%>%
  mutate(lnland_ft_blk_1867_1872 =lnland_ft_blk_1867_1872 *sqrt(plotsize))%>%
  mutate(lnbuilding_ft_n_1867_1869 =lnbuilding_ft_n_1867_1869 *sqrt(plotsize))%>%
  mutate(lnbuilding_ft_blk_1867_1869=lnbuilding_ft_blk_1867_1869*sqrt(plotsize))%>%
  mutate(lnbuilding_ft_n_1867_1871=lnbuilding_ft_n_1867_1871*sqrt(plotsize))%>%
  mutate(lnbuilding_ft_blk_1867_1871=lnbuilding_ft_blk_1867_1871*sqrt(plotsize))%>%
  mutate(lnbuilding_ft_n_1867_1872=lnbuilding_ft_n_1867_1872*sqrt(plotsize))%>%
  mutate(lnbuilding_ft_blk_1867_1872 =lnbuilding_ft_blk_1867_1872 *sqrt(plotsize))%>%
  mutate(lnland_ft_n_1869_1872 =lnland_ft_n_1869_1872 *sqrt(plotsize))%>%
  mutate(lnland_ft_n_1869_1871=lnland_ft_n_1869_1871*sqrt(plotsize))%>%
  mutate(lnland_ft_blk_1869_1872 =lnland_ft_blk_1869_1872 *sqrt(plotsize))%>%
  mutate(lnland_ft_blk_1869_1871=lnland_ft_blk_1869_1871*sqrt(plotsize))%>%
  mutate(lnbuilding_ft_n_1869_1872 =lnbuilding_ft_n_1869_1872 *sqrt(plotsize))%>%
  mutate(lnbuilding_ft_n_1869_1871=lnbuilding_ft_n_1869_1871*sqrt(plotsize))%>%
  mutate(lnbuilding_ft_blk_1869_1872=lnbuilding_ft_blk_1869_1872*sqrt(plotsize))%>%
  mutate(lnbuilding_ft_blk_1869_1871 =lnbuilding_ft_blk_1869_1871 *sqrt(plotsize))%>%
  mutate(lnland_ft_n_1871_1872 =lnland_ft_n_1871_1872*sqrt(plotsize))%>%
  mutate(lnbuilding_ft_n_1871_1872=lnbuilding_ft_n_1871_1872*sqrt(plotsize))%>%
  mutate(lnland_ft_blk_1871_1872=lnland_ft_n_1871_1872*sqrt(plotsize))%>%
  mutate(lnbuilding_ft_blk_1871_1872 =lnbuilding_ft_blk_1871_1872*sqrt(plotsize))


rdf12<- filter(rdf1,(year == 1872 ) & sample1==1)%>%
  mutate(lnvalue_land_ft=lnvalue_land_ft*sqrt(plotsize))%>%
  mutate(lnvalue_building_ft=lnvalue_building_ft*sqrt(plotsize))%>%
  mutate(burned_1867=burned_1867*sqrt(plotsize))%>%
  mutate(burned_1869=burned_1869*sqrt(plotsize))%>%
  mutate(burned_1871=burned_1871*sqrt(plotsize))%>%
  mutate(burned_1872=burned_1872*sqrt(plotsize))%>%
  mutate(year_1869=year_1869*sqrt(plotsize))%>%
  mutate(year_1871=year_1871*sqrt(plotsize))%>%
  mutate(year_1872=year_1872*sqrt(plotsize))%>%
  mutate(lnland_ft_n_1867_1869 =lnland_ft_n_1867_1869 *sqrt(plotsize))%>%
  mutate(lnland_ft_blk_1867_1869=lnland_ft_blk_1867_1869*sqrt(plotsize))%>%
  mutate(lnland_ft_n_1867_1871=lnland_ft_n_1867_1871*sqrt(plotsize))%>%
  mutate(lnland_ft_blk_1867_1871=lnland_ft_blk_1867_1871*sqrt(plotsize))%>%
  mutate(lnland_ft_n_1867_1872=lnland_ft_n_1867_1872*sqrt(plotsize))%>%
  mutate(lnland_ft_blk_1867_1872 =lnland_ft_blk_1867_1872 *sqrt(plotsize))%>%
  mutate(lnbuilding_ft_n_1867_1869 =lnbuilding_ft_n_1867_1869 *sqrt(plotsize))%>%
```

```
  mutate(lnbuilding_ft_blk_1867_1869=lnbuilding_ft_blk_1867_1869*sqrt(plotsize))%>%
  mutate(lnbuilding_ft_n_1867_1871=lnbuilding_ft_n_1867_1871*sqrt(plotsize))%>%
  mutate(lnbuilding_ft_blk_1867_1871=lnbuilding_ft_blk_1867_1871*sqrt(plotsize))%>%
  mutate(lnbuilding_ft_n_1867_1872=lnbuilding_ft_n_1867_1872*sqrt(plotsize))%>%
  mutate(lnbuilding_ft_blk_1867_1872 =lnbuilding_ft_blk_1867_1872 *sqrt(plotsize))%>%
  mutate(lnland_ft_n_1869_1872 =lnland_ft_n_1869_1872 *sqrt(plotsize))%>%
  mutate(lnland_ft_n_1869_1871=lnland_ft_n_1869_1871*sqrt(plotsize))%>%
  mutate(lnland_ft_blk_1869_1872 =lnland_ft_blk_1869_1872 *sqrt(plotsize))%>%
  mutate(lnland_ft_blk_1869_1871=lnland_ft_blk_1869_1871*sqrt(plotsize))%>%
  mutate(lnbuilding_ft_n_1869_1872 =lnbuilding_ft_n_1869_1872 *sqrt(plotsize))%>%
  mutate(lnbuilding_ft_n_1869_1871=lnbuilding_ft_n_1869_1871*sqrt(plotsize))%>%
  mutate(lnbuilding_ft_blk_1869_1872=lnbuilding_ft_blk_1869_1872*sqrt(plotsize))%>%
  mutate(lnbuilding_ft_blk_1869_1871 =lnbuilding_ft_blk_1869_1871 *sqrt(plotsize))%>%
  mutate(lnland_ft_n_1871_1872 =lnland_ft_n_1871_1872*sqrt(plotsize))%>%
  mutate(lnbuilding_ft_n_1871_1872=lnbuilding_ft_n_1871_1872*sqrt(plotsize))%>%
  mutate(lnland_ft_blk_1871_1872=lnland_ft_n_1871_1872*sqrt(plotsize))%>%
  mutate(lnbuilding_ft_blk_1871_1872 =lnbuilding_ft_blk_1871_1872*sqrt(plotsize))


rdf11<- filter(rdf1,(year == 1872 ) & sample2==1)%>%
  mutate(lnvalue_land_ft=lnvalue_land_ft*sqrt(plotsize))%>%
  mutate(lnvalue_building_ft=lnvalue_building_ft*sqrt(plotsize))%>%
  mutate(burned_1867=burned_1867*sqrt(plotsize))%>%
  mutate(burned_1869=burned_1869*sqrt(plotsize))%>%
  mutate(burned_1871=burned_1871*sqrt(plotsize))%>%
  mutate(burned_1872=burned_1872*sqrt(plotsize))%>%
  mutate(year_1869=year_1869*sqrt(plotsize))%>%
  mutate(year_1871=year_1871*sqrt(plotsize))%>%
  mutate(year_1872=year_1872*sqrt(plotsize))%>%
  mutate(lnland_ft_n_1867_1869 =lnland_ft_n_1867_1869 *sqrt(plotsize))%>%
  mutate(lnland_ft_blk_1867_1869=lnland_ft_blk_1867_1869*sqrt(plotsize))%>%
  mutate(lnland_ft_n_1867_1871=lnland_ft_n_1867_1871*sqrt(plotsize))%>%
  mutate(lnland_ft_blk_1867_1871=lnland_ft_blk_1867_1871*sqrt(plotsize))%>%
  mutate(lnland_ft_n_1867_1872=lnland_ft_n_1867_1872*sqrt(plotsize))%>%
  mutate(lnland_ft_blk_1867_1872 =lnland_ft_blk_1867_1872 *sqrt(plotsize))%>%
  mutate(lnbuilding_ft_n_1867_1869 =lnbuilding_ft_n_1867_1869 *sqrt(plotsize))%>%
  mutate(lnbuilding_ft_blk_1867_1869=lnbuilding_ft_blk_1867_1869*sqrt(plotsize))%>%
  mutate(lnbuilding_ft_n_1867_1871=lnbuilding_ft_n_1867_1871*sqrt(plotsize))%>%
  mutate(lnbuilding_ft_blk_1867_1871=lnbuilding_ft_blk_1867_1871*sqrt(plotsize))%>%
  mutate(lnbuilding_ft_n_1867_1872=lnbuilding_ft_n_1867_1872*sqrt(plotsize))%>%
  mutate(lnbuilding_ft_blk_1867_1872 =lnbuilding_ft_blk_1867_1872 *sqrt(plotsize))%>%
  mutate(lnland_ft_n_1869_1872 =lnland_ft_n_1869_1872 *sqrt(plotsize))%>%
  mutate(lnland_ft_n_1869_1871=lnland_ft_n_1869_1871*sqrt(plotsize))%>%
  mutate(lnland_ft_blk_1869_1872 =lnland_ft_blk_1869_1872 *sqrt(plotsize))%>%
  mutate(lnland_ft_blk_1869_1871=lnland_ft_blk_1869_1871*sqrt(plotsize))%>%
  mutate(lnbuilding_ft_n_1869_1872 =lnbuilding_ft_n_1869_1872 *sqrt(plotsize))%>%
  mutate(lnbuilding_ft_n_1869_1871=lnbuilding_ft_n_1869_1871*sqrt(plotsize))%>%
  mutate(lnbuilding_ft_blk_1869_1872=lnbuilding_ft_blk_1869_1872*sqrt(plotsize))%>%
  mutate(lnbuilding_ft_blk_1869_1871 =lnbuilding_ft_blk_1869_1871 *sqrt(plotsize))%>%
  mutate(lnland_ft_n_1871_1872 =lnland_ft_n_1871_1872*sqrt(plotsize))%>%
  mutate(lnbuilding_ft_n_1871_1872=lnbuilding_ft_n_1871_1872*sqrt(plotsize))%>%
  mutate(lnland_ft_blk_1871_1872=lnland_ft_n_1871_1872*sqrt(plotsize))%>%
  mutate(lnbuilding_ft_blk_1871_1872 =lnbuilding_ft_blk_1871_1872*sqrt(plotsize))
```

```
rdf10<- filter(rdf1,(year == 1872 | year == 1871 ) & sample0==1)%>%
  mutate(lnvalue_land_ft=lnvalue_land_ft*sqrt(plotsize))%>%
  mutate(lnvalue_building_ft=lnvalue_building_ft*sqrt(plotsize))%>%
  mutate(burned_1867=burned_1867*sqrt(plotsize))%>%
  mutate(burned_1869=burned_1869*sqrt(plotsize))%>%
  mutate(burned_1871=burned_1871*sqrt(plotsize))%>%
  mutate(burned_1872=burned_1872*sqrt(plotsize))%>%
  mutate(year_1869=year_1869*sqrt(plotsize))%>%
  mutate(year_1871=year_1871*sqrt(plotsize))%>%
  mutate(year_1872=year_1872*sqrt(plotsize))%>%
  mutate(lnland_ft_n_1867_1869 =lnland_ft_n_1867_1869 *sqrt(plotsize))%>%
  mutate(lnland_ft_blk_1867_1869=lnland_ft_blk_1867_1869*sqrt(plotsize))%>%
  mutate(lnland_ft_n_1867_1871=lnland_ft_n_1867_1871*sqrt(plotsize))%>%
  mutate(lnland_ft_blk_1867_1871=lnland_ft_blk_1867_1871*sqrt(plotsize))%>%
  mutate(lnland_ft_n_1867_1872=lnland_ft_n_1867_1872*sqrt(plotsize))%>%
  mutate(lnland_ft_blk_1867_1872 =lnland_ft_blk_1867_1872 *sqrt(plotsize))%>%
  mutate(lnbuilding_ft_n_1867_1869 =lnbuilding_ft_n_1867_1869 *sqrt(plotsize))%>%
  mutate(lnbuilding_ft_blk_1867_1869=lnbuilding_ft_blk_1867_1869*sqrt(plotsize))%>%
  mutate(lnbuilding_ft_n_1867_1871=lnbuilding_ft_n_1867_1871*sqrt(plotsize))%>%
  mutate(lnbuilding_ft_blk_1867_1871=lnbuilding_ft_blk_1867_1871*sqrt(plotsize))%>%
  mutate(lnbuilding_ft_n_1867_1872=lnbuilding_ft_n_1867_1872*sqrt(plotsize))%>%
  mutate(lnbuilding_ft_blk_1867_1872 =lnbuilding_ft_blk_1867_1872 *sqrt(plotsize))%>%
  mutate(lnland_ft_n_1869_1872 =lnland_ft_n_1869_1872 *sqrt(plotsize))%>%
  mutate(lnland_ft_n_1869_1871=lnland_ft_n_1869_1871*sqrt(plotsize))%>%
  mutate(lnland_ft_blk_1869_1872 =lnland_ft_blk_1869_1872 *sqrt(plotsize))%>%
  mutate(lnland_ft_blk_1869_1871=lnland_ft_blk_1869_1871*sqrt(plotsize))%>%
  mutate(lnbuilding_ft_n_1869_1872 =lnbuilding_ft_n_1869_1872 *sqrt(plotsize))%>%
  mutate(lnbuilding_ft_n_1869_1871=lnbuilding_ft_n_1869_1871*sqrt(plotsize))%>%
  mutate(lnbuilding_ft_blk_1869_1872=lnbuilding_ft_blk_1869_1872*sqrt(plotsize))%>%
  mutate(lnbuilding_ft_blk_1869_1871 =lnbuilding_ft_blk_1869_1871 *sqrt(plotsize))%>%
  mutate(lnland_ft_n_1871_1872 =lnland_ft_n_1871_1872*sqrt(plotsize))%>%
  mutate(lnbuilding_ft_n_1871_1872=lnbuilding_ft_n_1871_1872*sqrt(plotsize))%>%
  mutate(lnland_ft_blk_1871_1872=lnland_ft_n_1871_1872*sqrt(plotsize))%>%
  mutate(lnbuilding_ft_blk_1871_1872 =lnbuilding_ft_blk_1871_1872*sqrt(plotsize))


rdf9<- filter(rdf1,(year == 1872 | year == 1871 ) & sample1==1)%>%
  mutate(lnvalue_land_ft=lnvalue_land_ft*sqrt(plotsize))%>%
  mutate(lnvalue_building_ft=lnvalue_building_ft*sqrt(plotsize))%>%
  mutate(burned_1867=burned_1867*sqrt(plotsize))%>%
  mutate(burned_1869=burned_1869*sqrt(plotsize))%>%
  mutate(burned_1871=burned_1871*sqrt(plotsize))%>%
  mutate(burned_1872=burned_1872*sqrt(plotsize))%>%
  mutate(year_1869=year_1869*sqrt(plotsize))%>%
  mutate(year_1871=year_1871*sqrt(plotsize))%>%
  mutate(year_1872=year_1872*sqrt(plotsize))%>%
  mutate(lnland_ft_n_1867_1869 =lnland_ft_n_1867_1869 *sqrt(plotsize))%>%
  mutate(lnland_ft_blk_1867_1869=lnland_ft_blk_1867_1869*sqrt(plotsize))%>%
  mutate(lnland_ft_n_1867_1871=lnland_ft_n_1867_1871*sqrt(plotsize))%>%
  mutate(lnland_ft_blk_1867_1871=lnland_ft_blk_1867_1871*sqrt(plotsize))%>%
```

```
  mutate(lnland_ft_n_1867_1872=lnland_ft_n_1867_1872*sqrt(plotsize))%>%
  mutate(lnland_ft_blk_1867_1872 =lnland_ft_blk_1867_1872 *sqrt(plotsize))%>%
  mutate(lnbuilding_ft_n_1867_1869 =lnbuilding_ft_n_1867_1869 *sqrt(plotsize))%>%
  mutate(lnbuilding_ft_blk_1867_1869=lnbuilding_ft_blk_1867_1869*sqrt(plotsize))%>%
  mutate(lnbuilding_ft_n_1867_1871=lnbuilding_ft_n_1867_1871*sqrt(plotsize))%>%
  mutate(lnbuilding_ft_blk_1867_1871=lnbuilding_ft_blk_1867_1871*sqrt(plotsize))%>%
  mutate(lnbuilding_ft_n_1867_1872=lnbuilding_ft_n_1867_1872*sqrt(plotsize))%>%
  mutate(lnbuilding_ft_blk_1867_1872 =lnbuilding_ft_blk_1867_1872 *sqrt(plotsize))%>%
  mutate(lnland_ft_n_1869_1872 =lnland_ft_n_1869_1872 *sqrt(plotsize))%>%
  mutate(lnland_ft_n_1869_1871=lnland_ft_n_1869_1871*sqrt(plotsize))%>%
  mutate(lnland_ft_blk_1869_1872 =lnland_ft_blk_1869_1872 *sqrt(plotsize))%>%
  mutate(lnland_ft_blk_1869_1871=lnland_ft_blk_1869_1871*sqrt(plotsize))%>%
  mutate(lnbuilding_ft_n_1869_1872 =lnbuilding_ft_n_1869_1872 *sqrt(plotsize))%>%
  mutate(lnbuilding_ft_n_1869_1871=lnbuilding_ft_n_1869_1871*sqrt(plotsize))%>%
  mutate(lnbuilding_ft_blk_1869_1872=lnbuilding_ft_blk_1869_1872*sqrt(plotsize))%>%
  mutate(lnbuilding_ft_blk_1869_1871 =lnbuilding_ft_blk_1869_1871 *sqrt(plotsize))%>%
  mutate(lnland_ft_n_1871_1872 =lnland_ft_n_1871_1872*sqrt(plotsize))%>%
  mutate(lnbuilding_ft_n_1871_1872=lnbuilding_ft_n_1871_1872*sqrt(plotsize))%>%
  mutate(lnland_ft_blk_1871_1872=lnland_ft_n_1871_1872*sqrt(plotsize))%>%
  mutate(lnbuilding_ft_blk_1871_1872 =lnbuilding_ft_blk_1871_1872*sqrt(plotsize))


rdf8<- filter(rdf1,(year == 1872 | year == 1871 ) & sample2==1)%>%
  mutate(lnvalue_land_ft=lnvalue_land_ft*sqrt(plotsize))%>%
  mutate(lnvalue_building_ft=lnvalue_building_ft*sqrt(plotsize))%>%
  mutate(burned_1867=burned_1867*sqrt(plotsize))%>%
  mutate(burned_1869=burned_1869*sqrt(plotsize))%>%
  mutate(burned_1871=burned_1871*sqrt(plotsize))%>%
  mutate(burned_1872=burned_1872*sqrt(plotsize))%>%
  mutate(year_1869=year_1869*sqrt(plotsize))%>%
  mutate(year_1871=year_1871*sqrt(plotsize))%>%
  mutate(year_1872=year_1872*sqrt(plotsize))%>%
  mutate(lnland_ft_n_1867_1869 =lnland_ft_n_1867_1869 *sqrt(plotsize))%>%
  mutate(lnland_ft_blk_1867_1869=lnland_ft_blk_1867_1869*sqrt(plotsize))%>%
  mutate(lnland_ft_n_1867_1871=lnland_ft_n_1867_1871*sqrt(plotsize))%>%
  mutate(lnland_ft_blk_1867_1871=lnland_ft_blk_1867_1871*sqrt(plotsize))%>%
  mutate(lnland_ft_n_1867_1872=lnland_ft_n_1867_1872*sqrt(plotsize))%>%
  mutate(lnland_ft_blk_1867_1872 =lnland_ft_blk_1867_1872 *sqrt(plotsize))%>%
  mutate(lnbuilding_ft_n_1867_1869 =lnbuilding_ft_n_1867_1869 *sqrt(plotsize))%>%
  mutate(lnbuilding_ft_blk_1867_1869=lnbuilding_ft_blk_1867_1869*sqrt(plotsize))%>%
  mutate(lnbuilding_ft_n_1867_1871=lnbuilding_ft_n_1867_1871*sqrt(plotsize))%>%
  mutate(lnbuilding_ft_blk_1867_1871=lnbuilding_ft_blk_1867_1871*sqrt(plotsize))%>%
  mutate(lnbuilding_ft_n_1867_1872=lnbuilding_ft_n_1867_1872*sqrt(plotsize))%>%
  mutate(lnbuilding_ft_blk_1867_1872 =lnbuilding_ft_blk_1867_1872 *sqrt(plotsize))%>%
  mutate(lnland_ft_n_1869_1872 =lnland_ft_n_1869_1872 *sqrt(plotsize))%>%
  mutate(lnland_ft_n_1869_1871=lnland_ft_n_1869_1871*sqrt(plotsize))%>%
  mutate(lnland_ft_blk_1869_1872 =lnland_ft_blk_1869_1872 *sqrt(plotsize))%>%
  mutate(lnland_ft_blk_1869_1871=lnland_ft_blk_1869_1871*sqrt(plotsize))%>%
  mutate(lnbuilding_ft_n_1869_1872 =lnbuilding_ft_n_1869_1872 *sqrt(plotsize))%>%
  mutate(lnbuilding_ft_n_1869_1871=lnbuilding_ft_n_1869_1871*sqrt(plotsize))%>%
  mutate(lnbuilding_ft_blk_1869_1872=lnbuilding_ft_blk_1869_1872*sqrt(plotsize))%>%
  mutate(lnbuilding_ft_blk_1869_1871 =lnbuilding_ft_blk_1869_1871 *sqrt(plotsize))%>%
  mutate(lnland_ft_n_1871_1872 =lnland_ft_n_1871_1872*sqrt(plotsize))%>%
```

```
  mutate(lnbuilding_ft_n_1871_1872=lnbuilding_ft_n_1871_1872*sqrt(plotsize))%>%
  mutate(lnland_ft_blk_1871_1872=lnland_ft_n_1871_1872*sqrt(plotsize))%>%
  mutate(lnbuilding_ft_blk_1871_1872 =lnbuilding_ft_blk_1871_1872*sqrt(plotsize))


rdf7<- filter(rdf1,(year == 1872 | year == 1871 | year == 1869 ) & sample0==1)%>%
  mutate(lnvalue_land_ft=lnvalue_land_ft*sqrt(plotsize))%>%
  mutate(lnvalue_building_ft=lnvalue_building_ft*sqrt(plotsize))%>%
  mutate(burned_1867=burned_1867*sqrt(plotsize))%>%
  mutate(burned_1869=burned_1869*sqrt(plotsize))%>%
  mutate(burned_1871=burned_1871*sqrt(plotsize))%>%
  mutate(burned_1872=burned_1872*sqrt(plotsize))%>%
  mutate(year_1869=year_1869*sqrt(plotsize))%>%
  mutate(year_1871=year_1871*sqrt(plotsize))%>%
  mutate(year_1872=year_1872*sqrt(plotsize))%>%
  mutate(lnland_ft_n_1867_1869 =lnland_ft_n_1867_1869 *sqrt(plotsize))%>%
  mutate(lnland_ft_blk_1867_1869=lnland_ft_blk_1867_1869*sqrt(plotsize))%>%
  mutate(lnland_ft_n_1867_1871=lnland_ft_n_1867_1871*sqrt(plotsize))%>%
  mutate(lnland_ft_blk_1867_1871=lnland_ft_blk_1867_1871*sqrt(plotsize))%>%
  mutate(lnland_ft_n_1867_1872=lnland_ft_n_1867_1872*sqrt(plotsize))%>%
  mutate(lnland_ft_blk_1867_1872 =lnland_ft_blk_1867_1872 *sqrt(plotsize))%>%
  mutate(lnbuilding_ft_n_1867_1869 =lnbuilding_ft_n_1867_1869 *sqrt(plotsize))%>%
  mutate(lnbuilding_ft_blk_1867_1869=lnbuilding_ft_blk_1867_1869*sqrt(plotsize))%>%
  mutate(lnbuilding_ft_n_1867_1871=lnbuilding_ft_n_1867_1871*sqrt(plotsize))%>%
  mutate(lnbuilding_ft_blk_1867_1871=lnbuilding_ft_blk_1867_1871*sqrt(plotsize))%>%
  mutate(lnbuilding_ft_n_1867_1872=lnbuilding_ft_n_1867_1872*sqrt(plotsize))%>%
  mutate(lnbuilding_ft_blk_1867_1872 =lnbuilding_ft_blk_1867_1872 *sqrt(plotsize))%>%
  mutate(lnland_ft_n_1869_1872 =lnland_ft_n_1869_1872 *sqrt(plotsize))%>%
  mutate(lnland_ft_n_1869_1871=lnland_ft_n_1869_1871*sqrt(plotsize))%>%
  mutate(lnland_ft_blk_1869_1872 =lnland_ft_blk_1869_1872 *sqrt(plotsize))%>%
  mutate(lnland_ft_blk_1869_1871=lnland_ft_blk_1869_1871*sqrt(plotsize))%>%
  mutate(lnbuilding_ft_n_1869_1872 =lnbuilding_ft_n_1869_1872 *sqrt(plotsize))%>%
  mutate(lnbuilding_ft_n_1869_1871=lnbuilding_ft_n_1869_1871*sqrt(plotsize))%>%
  mutate(lnbuilding_ft_blk_1869_1872=lnbuilding_ft_blk_1869_1872*sqrt(plotsize))%>%
  mutate(lnbuilding_ft_blk_1869_1871 =lnbuilding_ft_blk_1869_1871 *sqrt(plotsize))%>%
  mutate(lnland_ft_n_1871_1872 =lnland_ft_n_1871_1872*sqrt(plotsize))%>%
  mutate(lnbuilding_ft_n_1871_1872=lnbuilding_ft_n_1871_1872*sqrt(plotsize))%>%
  mutate(lnland_ft_blk_1871_1872=lnland_ft_n_1871_1872*sqrt(plotsize))%>%
  mutate(lnbuilding_ft_blk_1871_1872 =lnbuilding_ft_blk_1871_1872*sqrt(plotsize))


rdf6<- filter(rdf1,(year == 1872 | year == 1871 | year == 1869 ) & sample1==1)%>%
  mutate(lnvalue_land_ft=lnvalue_land_ft*sqrt(plotsize))%>%
  mutate(lnvalue_building_ft=lnvalue_building_ft*sqrt(plotsize))%>%
  mutate(burned_1867=burned_1867*sqrt(plotsize))%>%
  mutate(burned_1869=burned_1869*sqrt(plotsize))%>%
  mutate(burned_1871=burned_1871*sqrt(plotsize))%>%
  mutate(burned_1872=burned_1872*sqrt(plotsize))%>%
  mutate(year_1869=year_1869*sqrt(plotsize))%>%
  mutate(year_1871=year_1871*sqrt(plotsize))%>%
  mutate(year_1872=year_1872*sqrt(plotsize))%>%
  mutate(lnland_ft_n_1867_1869 =lnland_ft_n_1867_1869 *sqrt(plotsize))%>%
```

```
  mutate(lnland_ft_blk_1867_1869=lnland_ft_blk_1867_1869*sqrt(plotsize))%>%
  mutate(lnland_ft_n_1867_1871=lnland_ft_n_1867_1871*sqrt(plotsize))%>%
  mutate(lnland_ft_blk_1867_1871=lnland_ft_blk_1867_1871*sqrt(plotsize))%>%
  mutate(lnland_ft_n_1867_1872=lnland_ft_n_1867_1872*sqrt(plotsize))%>%
  mutate(lnland_ft_blk_1867_1872 =lnland_ft_blk_1867_1872 *sqrt(plotsize))%>%
  mutate(lnbuilding_ft_n_1867_1869 =lnbuilding_ft_n_1867_1869 *sqrt(plotsize))%>%
  mutate(lnbuilding_ft_blk_1867_1869=lnbuilding_ft_blk_1867_1869*sqrt(plotsize))%>%
  mutate(lnbuilding_ft_n_1867_1871=lnbuilding_ft_n_1867_1871*sqrt(plotsize))%>%
  mutate(lnbuilding_ft_blk_1867_1871=lnbuilding_ft_blk_1867_1871*sqrt(plotsize))%>%
  mutate(lnbuilding_ft_n_1867_1872=lnbuilding_ft_n_1867_1872*sqrt(plotsize))%>%
  mutate(lnbuilding_ft_blk_1867_1872 =lnbuilding_ft_blk_1867_1872 *sqrt(plotsize))%>%
  mutate(lnland_ft_n_1869_1872 =lnland_ft_n_1869_1872 *sqrt(plotsize))%>%
  mutate(lnland_ft_n_1869_1871=lnland_ft_n_1869_1871*sqrt(plotsize))%>%
  mutate(lnland_ft_blk_1869_1872 =lnland_ft_blk_1869_1872 *sqrt(plotsize))%>%
  mutate(lnland_ft_blk_1869_1871=lnland_ft_blk_1869_1871*sqrt(plotsize))%>%
  mutate(lnbuilding_ft_n_1869_1872 =lnbuilding_ft_n_1869_1872 *sqrt(plotsize))%>%
  mutate(lnbuilding_ft_n_1869_1871=lnbuilding_ft_n_1869_1871*sqrt(plotsize))%>%
  mutate(lnbuilding_ft_blk_1869_1872=lnbuilding_ft_blk_1869_1872*sqrt(plotsize))%>%
  mutate(lnbuilding_ft_blk_1869_1871 =lnbuilding_ft_blk_1869_1871 *sqrt(plotsize))%>%
  mutate(lnland_ft_n_1871_1872 =lnland_ft_n_1871_1872*sqrt(plotsize))%>%
  mutate(lnbuilding_ft_n_1871_1872=lnbuilding_ft_n_1871_1872*sqrt(plotsize))%>%
  mutate(lnland_ft_blk_1871_1872=lnland_ft_n_1871_1872*sqrt(plotsize))%>%
  mutate(lnbuilding_ft_blk_1871_1872 =lnbuilding_ft_blk_1871_1872*sqrt(plotsize))


rdf5<- filter(rdf1,(year == 1872 | year == 1871 | year == 1869  ) & sample2==1)%>%
  mutate(lnvalue_land_ft=lnvalue_land_ft*sqrt(plotsize))%>%
  mutate(lnvalue_building_ft=lnvalue_building_ft*sqrt(plotsize))%>%
  mutate(burned_1867=burned_1867*sqrt(plotsize))%>%
  mutate(burned_1869=burned_1869*sqrt(plotsize))%>%
  mutate(burned_1871=burned_1871*sqrt(plotsize))%>%
  mutate(burned_1872=burned_1872*sqrt(plotsize))%>%
  mutate(year_1869=year_1869*sqrt(plotsize))%>%
  mutate(year_1871=year_1871*sqrt(plotsize))%>%
  mutate(year_1872=year_1872*sqrt(plotsize))%>%
  mutate(lnland_ft_n_1867_1869 =lnland_ft_n_1867_1869 *sqrt(plotsize))%>%
  mutate(lnland_ft_blk_1867_1869=lnland_ft_blk_1867_1869*sqrt(plotsize))%>%
  mutate(lnland_ft_n_1867_1871=lnland_ft_n_1867_1871*sqrt(plotsize))%>%
  mutate(lnland_ft_blk_1867_1871=lnland_ft_blk_1867_1871*sqrt(plotsize))%>%
  mutate(lnland_ft_n_1867_1872=lnland_ft_n_1867_1872*sqrt(plotsize))%>%
  mutate(lnland_ft_blk_1867_1872 =lnland_ft_blk_1867_1872 *sqrt(plotsize))%>%
  mutate(lnbuilding_ft_n_1867_1869 =lnbuilding_ft_n_1867_1869 *sqrt(plotsize))%>%
  mutate(lnbuilding_ft_blk_1867_1869=lnbuilding_ft_blk_1867_1869*sqrt(plotsize))%>%
  mutate(lnbuilding_ft_n_1867_1871=lnbuilding_ft_n_1867_1871*sqrt(plotsize))%>%
  mutate(lnbuilding_ft_blk_1867_1871=lnbuilding_ft_blk_1867_1871*sqrt(plotsize))%>%
  mutate(lnbuilding_ft_n_1867_1872=lnbuilding_ft_n_1867_1872*sqrt(plotsize))%>%
  mutate(lnbuilding_ft_blk_1867_1872 =lnbuilding_ft_blk_1867_1872 *sqrt(plotsize))%>%
  mutate(lnland_ft_n_1869_1872 =lnland_ft_n_1869_1872 *sqrt(plotsize))%>%
  mutate(lnland_ft_n_1869_1871=lnland_ft_n_1869_1871*sqrt(plotsize))%>%
  mutate(lnland_ft_blk_1869_1872 =lnland_ft_blk_1869_1872 *sqrt(plotsize))%>%
  mutate(lnland_ft_blk_1869_1871=lnland_ft_blk_1869_1871*sqrt(plotsize))%>%
  mutate(lnbuilding_ft_n_1869_1872 =lnbuilding_ft_n_1869_1872 *sqrt(plotsize))%>%
  mutate(lnbuilding_ft_n_1869_1871=lnbuilding_ft_n_1869_1871*sqrt(plotsize))%>%
```

```
  mutate(lnbuilding_ft_blk_1869_1872=lnbuilding_ft_blk_1869_1872*sqrt(plotsize))%>%
  mutate(lnbuilding_ft_blk_1869_1871 =lnbuilding_ft_blk_1869_1871 *sqrt(plotsize))%>%
  mutate(lnland_ft_n_1871_1872 =lnland_ft_n_1871_1872*sqrt(plotsize))%>%
  mutate(lnbuilding_ft_n_1871_1872=lnbuilding_ft_n_1871_1872*sqrt(plotsize))%>%
  mutate(lnland_ft_blk_1871_1872=lnland_ft_n_1871_1872*sqrt(plotsize))%>%
  mutate(lnbuilding_ft_blk_1871_1872 =lnbuilding_ft_blk_1871_1872*sqrt(plotsize))



rdf4<- filter(rdf1,(year == 1872 | year == 1871 | year == 1869 | year == 1867 ) & sample0==1)%>%
  mutate(lnvalue_land_ft=lnvalue_land_ft*sqrt(plotsize))%>%
  mutate(lnvalue_building_ft=lnvalue_building_ft*sqrt(plotsize))%>%
  mutate(burned_1867=burned_1867*sqrt(plotsize))%>%
  mutate(burned_1869=burned_1869*sqrt(plotsize))%>%
  mutate(burned_1871=burned_1871*sqrt(plotsize))%>%
  mutate(burned_1872=burned_1872*sqrt(plotsize))%>%
  mutate(year_1869=year_1869*sqrt(plotsize))%>%
  mutate(year_1871=year_1871*sqrt(plotsize))%>%
  mutate(year_1872=year_1872*sqrt(plotsize))%>%
  mutate(lnland_ft_n_1867_1869 =lnland_ft_n_1867_1869 *sqrt(plotsize))%>%
  mutate(lnland_ft_blk_1867_1869=lnland_ft_blk_1867_1869*sqrt(plotsize))%>%
  mutate(lnland_ft_n_1867_1871=lnland_ft_n_1867_1871*sqrt(plotsize))%>%
  mutate(lnland_ft_blk_1867_1871=lnland_ft_blk_1867_1871*sqrt(plotsize))%>%
  mutate(lnland_ft_n_1867_1872=lnland_ft_n_1867_1872*sqrt(plotsize))%>%
  mutate(lnland_ft_blk_1867_1872 =lnland_ft_blk_1867_1872 *sqrt(plotsize))%>%
  mutate(lnbuilding_ft_n_1867_1869 =lnbuilding_ft_n_1867_1869 *sqrt(plotsize))%>%
  mutate(lnbuilding_ft_blk_1867_1869=lnbuilding_ft_blk_1867_1869*sqrt(plotsize))%>%
  mutate(lnbuilding_ft_n_1867_1871=lnbuilding_ft_n_1867_1871*sqrt(plotsize))%>%
  mutate(lnbuilding_ft_blk_1867_1871=lnbuilding_ft_blk_1867_1871*sqrt(plotsize))%>%
  mutate(lnbuilding_ft_n_1867_1872=lnbuilding_ft_n_1867_1872*sqrt(plotsize))%>%
  mutate(lnbuilding_ft_blk_1867_1872 =lnbuilding_ft_blk_1867_1872 *sqrt(plotsize))%>%
  mutate(lnland_ft_n_1869_1872 =lnland_ft_n_1869_1872 *sqrt(plotsize))%>%
  mutate(lnland_ft_n_1869_1871=lnland_ft_n_1869_1871*sqrt(plotsize))%>%
  mutate(lnland_ft_blk_1869_1872 =lnland_ft_blk_1869_1872 *sqrt(plotsize))%>%
  mutate(lnland_ft_blk_1869_1871=lnland_ft_blk_1869_1871*sqrt(plotsize))%>%
  mutate(lnbuilding_ft_n_1869_1872 =lnbuilding_ft_n_1869_1872 *sqrt(plotsize))%>%
  mutate(lnbuilding_ft_n_1869_1871=lnbuilding_ft_n_1869_1871*sqrt(plotsize))%>%
  mutate(lnbuilding_ft_blk_1869_1872=lnbuilding_ft_blk_1869_1872*sqrt(plotsize))%>%
  mutate(lnbuilding_ft_blk_1869_1871 =lnbuilding_ft_blk_1869_1871 *sqrt(plotsize))%>%
  mutate(lnland_ft_n_1871_1872 =lnland_ft_n_1871_1872*sqrt(plotsize))%>%
  mutate(lnbuilding_ft_n_1871_1872=lnbuilding_ft_n_1871_1872*sqrt(plotsize))%>%
  mutate(lnland_ft_blk_1871_1872=lnland_ft_n_1871_1872*sqrt(plotsize))%>%
  mutate(lnbuilding_ft_blk_1871_1872 =lnbuilding_ft_blk_1871_1872*sqrt(plotsize))


rdf3<- filter(rdf1,(year == 1872 | year == 1871 | year == 1869 | year == 1867 ) & sample1==1)%>%
  mutate(lnvalue_land_ft=lnvalue_land_ft*sqrt(plotsize))%>%
  mutate(lnvalue_building_ft=lnvalue_building_ft*sqrt(plotsize))%>%
  mutate(burned_1867=burned_1867*sqrt(plotsize))%>%
  mutate(burned_1869=burned_1869*sqrt(plotsize))%>%
  mutate(burned_1871=burned_1871*sqrt(plotsize))%>%
  mutate(burned_1872=burned_1872*sqrt(plotsize))%>%
```

```
  mutate(year_1869=year_1869*sqrt(plotsize))%>%
  mutate(year_1871=year_1871*sqrt(plotsize))%>%
  mutate(year_1872=year_1872*sqrt(plotsize))%>%
  mutate(lnland_ft_n_1867_1869 =lnland_ft_n_1867_1869 *sqrt(plotsize))%>%
  mutate(lnland_ft_blk_1867_1869=lnland_ft_blk_1867_1869*sqrt(plotsize))%>%
  mutate(lnland_ft_n_1867_1871=lnland_ft_n_1867_1871*sqrt(plotsize))%>%
  mutate(lnland_ft_blk_1867_1871=lnland_ft_blk_1867_1871*sqrt(plotsize))%>%
  mutate(lnland_ft_n_1867_1872=lnland_ft_n_1867_1872*sqrt(plotsize))%>%
  mutate(lnland_ft_blk_1867_1872 =lnland_ft_blk_1867_1872 *sqrt(plotsize))%>%
  mutate(lnbuilding_ft_n_1867_1869 =lnbuilding_ft_n_1867_1869 *sqrt(plotsize))%>%
  mutate(lnbuilding_ft_blk_1867_1869=lnbuilding_ft_blk_1867_1869*sqrt(plotsize))%>%
  mutate(lnbuilding_ft_n_1867_1871=lnbuilding_ft_n_1867_1871*sqrt(plotsize))%>%
  mutate(lnbuilding_ft_blk_1867_1871=lnbuilding_ft_blk_1867_1871*sqrt(plotsize))%>%
  mutate(lnbuilding_ft_n_1867_1872=lnbuilding_ft_n_1867_1872*sqrt(plotsize))%>%
  mutate(lnbuilding_ft_blk_1867_1872 =lnbuilding_ft_blk_1867_1872 *sqrt(plotsize))%>%
  mutate(lnland_ft_n_1869_1872 =lnland_ft_n_1869_1872 *sqrt(plotsize))%>%
  mutate(lnland_ft_n_1869_1871=lnland_ft_n_1869_1871*sqrt(plotsize))%>%
  mutate(lnland_ft_blk_1869_1872 =lnland_ft_blk_1869_1872 *sqrt(plotsize))%>%
  mutate(lnland_ft_blk_1869_1871=lnland_ft_blk_1869_1871*sqrt(plotsize))%>%
  mutate(lnbuilding_ft_n_1869_1872 =lnbuilding_ft_n_1869_1872 *sqrt(plotsize))%>%
  mutate(lnbuilding_ft_n_1869_1871=lnbuilding_ft_n_1869_1871*sqrt(plotsize))%>%
  mutate(lnbuilding_ft_blk_1869_1872=lnbuilding_ft_blk_1869_1872*sqrt(plotsize))%>%
  mutate(lnbuilding_ft_blk_1869_1871 =lnbuilding_ft_blk_1869_1871 *sqrt(plotsize))%>%
  mutate(lnland_ft_n_1871_1872 =lnland_ft_n_1871_1872*sqrt(plotsize))%>%
  mutate(lnbuilding_ft_n_1871_1872=lnbuilding_ft_n_1871_1872*sqrt(plotsize))%>%
  mutate(lnland_ft_blk_1871_1872=lnland_ft_n_1871_1872*sqrt(plotsize))%>%
  mutate(lnbuilding_ft_blk_1871_1872 =lnbuilding_ft_blk_1871_1872*sqrt(plotsize))



rdf2<- filter(rdf1,(year == 1872 | year == 1871 | year == 1869 | year == 1867 ) & sample2==1)%>%
  mutate(lnvalue_land_ft=lnvalue_land_ft*sqrt(plotsize))%>%
  mutate(lnvalue_building_ft=lnvalue_building_ft*sqrt(plotsize))%>%
  mutate(burned_1867=burned_1867*sqrt(plotsize))%>%
  mutate(burned_1869=burned_1869*sqrt(plotsize))%>%
  mutate(burned_1871=burned_1871*sqrt(plotsize))%>%
  mutate(burned_1872=burned_1872*sqrt(plotsize))%>%
  mutate(year_1869=year_1869*sqrt(plotsize))%>%
  mutate(year_1871=year_1871*sqrt(plotsize))%>%
  mutate(year_1872=year_1872*sqrt(plotsize))%>%
  mutate(lnland_ft_n_1867_1869 =lnland_ft_n_1867_1869 *sqrt(plotsize))%>%
  mutate(lnland_ft_blk_1867_1869=lnland_ft_blk_1867_1869*sqrt(plotsize))%>%
  mutate(lnland_ft_n_1867_1871=lnland_ft_n_1867_1871*sqrt(plotsize))%>%
  mutate(lnland_ft_blk_1867_1871=lnland_ft_blk_1867_1871*sqrt(plotsize))%>%
  mutate(lnland_ft_n_1867_1872=lnland_ft_n_1867_1872*sqrt(plotsize))%>%
  mutate(lnland_ft_blk_1867_1872 =lnland_ft_blk_1867_1872 *sqrt(plotsize))%>%
  mutate(lnbuilding_ft_n_1867_1869 =lnbuilding_ft_n_1867_1869 *sqrt(plotsize))%>%
  mutate(lnbuilding_ft_blk_1867_1869=lnbuilding_ft_blk_1867_1869*sqrt(plotsize))%>%
  mutate(lnbuilding_ft_n_1867_1871=lnbuilding_ft_n_1867_1871*sqrt(plotsize))%>%
  mutate(lnbuilding_ft_blk_1867_1871=lnbuilding_ft_blk_1867_1871*sqrt(plotsize))%>%
  mutate(lnbuilding_ft_n_1867_1872=lnbuilding_ft_n_1867_1872*sqrt(plotsize))%>%
  mutate(lnbuilding_ft_blk_1867_1872 =lnbuilding_ft_blk_1867_1872 *sqrt(plotsize))%>%
  mutate(lnland_ft_n_1869_1872 =lnland_ft_n_1869_1872 *sqrt(plotsize))%>%
```

```
   mutate(lnland_ft_n_1869_1871=lnland_ft_n_1869_1871*sqrt(plotsize))%>%
   mutate(lnland_ft_blk_1869_1872 =lnland_ft_blk_1869_1872 *sqrt(plotsize))%>%
   mutate(lnland_ft_blk_1869_1871=lnland_ft_blk_1869_1871*sqrt(plotsize))%>%
   mutate(lnbuilding_ft_n_1869_1872 =lnbuilding_ft_n_1869_1872 *sqrt(plotsize))%>%
   mutate(lnbuilding_ft_n_1869_1871=lnbuilding_ft_n_1869_1871*sqrt(plotsize))%>%
   mutate(lnbuilding_ft_blk_1869_1872=lnbuilding_ft_blk_1869_1872*sqrt(plotsize))%>%
   mutate(lnbuilding_ft_blk_1869_1871 =lnbuilding_ft_blk_1869_1871 *sqrt(plotsize))%>%
   mutate(lnland_ft_n_1871_1872 =lnland_ft_n_1871_1872*sqrt(plotsize))%>%
   mutate(lnbuilding_ft_n_1871_1872=lnbuilding_ft_n_1871_1872*sqrt(plotsize))%>%
   mutate(lnland_ft_blk_1871_1872=lnland_ft_n_1871_1872*sqrt(plotsize))%>%
   mutate(lnbuilding_ft_blk_1871_1872 =lnbuilding_ft_blk_1871_1872*sqrt(plotsize))

 #Regressions necessary for Replicating Table 1 in the Paper

#>>>>>>>>>>>>>>>>>>>>>>>>>>>>>>>>>>>>>>>>land_ft>>>>>>>>>>>>>>>>>>>>>>>>>>>>>>>>
reg01 <- lm(lnvalue_land_ft  ~    burned_1867  + burned_1869+ burned_1871+
              burned_1872+year_1869+ year_1871 +year_1872, data=rdf4)
reg02 <- lm(lnvalue_land_ft  ~    burned_1867  + burned_1869+ burned_1871+
              burned_1872+year_1869+ year_1871 +year_1872, data=rdf3)
reg03 <- lm(lnvalue_land_ft  ~  burned_1867 +burned_1869+ burned_1871+
              burned_1872+year_1869+ year_1871 +year_1872, data=rdf2)
#>>>>>>>>>>>>>>>>>>>>>>>>>>>>>>>>>>>>  land_ft >>>>>>>>>>>>>>>>>>>>>>>>>>>>>>>>
#>>>>>>>>>>>>>>>>>>>>>>>>>>>>>>>>>>>>>>>>land_ft>>>>>>>>>>>>>>>>>>>>>>>>>>>>>>>>
reg04 <- lm(lnvalue_land_ft  ~  burned_1869 + burned_1871+ burned_1872+
              year_1871 +year_1872 +lnland_ft_n_1867_1869
            + lnland_ft_blk_1867_1869 +lnland_ft_n_1867_1871
            + lnland_ft_blk_1867_1871 +lnland_ft_n_1867_1872+
              lnland_ft_blk_1867_1872 , data=rdf7)
reg05 <- lm(lnvalue_land_ft  ~burned_1869  + burned_1871+ burned_1872+
              year_1871 +year_1872+lnland_ft_n_1867_1869   +
              lnland_ft_blk_1867_1869+lnland_ft_n_1867_1871
            + lnland_ft_blk_1867_1871 +lnland_ft_n_1867_1872 +lnland_ft_blk_1867_1872
            , data=rdf6)
reg06 <- lm(lnvalue_land_ft  ~ burned_1869 + burned_1871+burned_1872+ year_1871 +year_1872
            + lnland_ft_n_1867_1869 + lnland_ft_blk_1867_1869 + lnland_ft_n_1867_1871
            + lnland_ft_blk_1867_1871 + lnland_ft_n_1867_1872 +lnland_ft_blk_1867_1872
            , data=rdf5)
#>>>>>>>>>>>>>>>>>>>>>>>>>>>>>>>>>>>>>>>>>>>>>>>>land_ft>>>>>>>>>>>>>>>>>>>>>>>>>>>>>>>>>>>>>>>>

#>>>>>>>>>>>>>>>>>>>>>>>>>>>>>>>>>>>>>>>>>>>>>>>>land_ft>>>>>>>>>>>>>>>>>>>>>>>>>>>>>>>>>>>>>>>>>>>>>>>>
reg07 <- lm(lnvalue_land_ft  ~  burned_1871+ burned_1872 +year_1872
            +     lnland_ft_n_1869_1872 +lnland_ft_n_1867_1872  +
              lnland_ft_blk_1869_1872 +lnland_ft_blk_1867_1872    +
              lnland_ft_n_1869_1871 +lnland_ft_n_1867_1871
            +lnland_ft_blk_1869_1871+lnland_ft_blk_1867_1871 , data=rdf10)
reg08 <- lm(lnvalue_land_ft  ~burned_1871+ burned_1872 +year_1872
            +     lnland_ft_n_1869_1872+lnland_ft_n_1867_1872
            +  lnland_ft_blk_1869_1872 + lnland_ft_blk_1867_1872    +
              lnland_ft_n_1869_1871 +lnland_ft_n_1867_1871
            +lnland_ft_blk_1869_1871+lnland_ft_blk_1867_1871 , data=rdf9)
reg09 <- lm(lnvalue_land_ft  ~   burned_1871+ burned_1872 +year_1872
            + lnland_ft_n_1869_1872 +lnland_ft_n_1867_1872+lnland_ft_blk_1869_1872
            + lnland_ft_blk_1867_1872 +lnland_ft_n_1869_1871+lnland_ft_n_1867_1871
```

```r
            +lnland_ft_blk_1869_1871+lnland_ft_blk_1867_1871,data=rdf8)
#>>>>>>>>>>>>>>>>>>>>>>>>>>>>>>>>>>>>>>>>>>>>>land_ft>>>>>>>>>>>>>>>>>>>>>>>>>>>>>>>>>>>>>>>>>>>>>

#>>>>>>>>>>>>>>>>>>>>>>>>>>>>>>>>>>>>>land_ft>>>>>>>>>>>>>>>>>>>>>>>>>>>>>>>>>>>>>>>>>>>>>>>>>>>>>>
reg010 <- lm(lnvalue_land_ft  ~ burned_1872 + lnland_ft_n_1871_1872 + lnland_ft_n_1869_1872 +
               lnland_ft_n_1867_1872 + lnland_ft_blk_1871_1872+lnland_ft_blk_1869_1872
             + lnland_ft_blk_1867_1872, data=rdf13)
reg011 <- lm(lnvalue_land_ft  ~ burned_1872 + lnland_ft_n_1871_1872+lnland_ft_n_1869_1872+
               lnland_ft_n_1867_1872 +lnland_ft_blk_1871_1872+
               lnland_ft_blk_1869_1872+lnland_ft_blk_1867_1872, data=rdf12)
reg012 <- lm(lnvalue_land_ft  ~ burned_1872 +lnland_ft_n_1871_1872+lnland_ft_n_1869_1872
             +lnland_ft_n_1867_1872 + lnland_ft_blk_1871_1872+lnland_ft_blk_1869_1872
             +lnland_ft_blk_1867_1872, data=rdf11)
#>>>>>>>>>>>>>>>>>>>>>>>>>>>>>>>>>>land_ft>>>>>>>>>>>>>>>>>>>>>>>>>>>>>>>>>>>>>>>>>>>>>>>>>>>>>>>>>>>


#>>>>>>>>>>>>>>>>>>>>>>>>>>>>>>>>>>> building_ft>>>>>>>>>>>>>>>>>>>>>>>>>>>>>>>>>>>>>>>>>>>>>>>>>>
reg001 <- lm(lnvalue_building_ft  ~ burned_1867+ burned_1869+ burned_1871+burned_1872+year_1869
             + year_1871+year_1872, data=rdf4)
reg002 <- lm(lnvalue_building_ft  ~ burned_1867+ burned_1869+ burned_1871+burned_1872+year_1869
             + year_1871+year_1872, data=rdf3)
reg003 <- lm(lnvalue_building_ft  ~ burned_1867  + burned_1869+ burned_1871+burned_1872
             +year_1869+ year_1871 +year_1872, data=rdf2)
#>>>>>>>>>>>>>>>>>>>>>>>>>>>>>>>>>>>>>  building_ft >>>>>>>>>>>>>>>>>>>>>>>>>>>>>>>>>>>>>>>>>>>>>>>>>>>

#>>>>>>>>>>>>>>>>>>>>>>>>>>>>>>>>>>>>>>>>>>>>>building_ft>>>>>>>>>>>>>>>>>>>>>>>>>>>>>>>>>>>>>>>>>>>>>>
reg004 <- lm(lnvalue_building_ft  ~   burned_1869  + burned_1871+ burned_1872+ year_1871 +year_1872
            +lnbuilding_ft_n_1867_1869+lnbuilding_ft_blk_1867_1869+lnbuilding_ft_n_1867_1871
            + lnbuilding_ft_blk_1867_1871+lnbuilding_ft_n_1867_1872+lnbuilding_ft_blk_1867_1872
            , data=rdf7)
reg005 <- lm(lnvalue_building_ft  ~   burned_1869  + burned_1871+ burned_1872+ year_1871 +year_1872
             +lnbuilding_ft_n_1867_1869+lnbuilding_ft_blk_1867_1869+lnbuilding_ft_n_1867_1871
             + lnbuilding_ft_blk_1867_1871+lnbuilding_ft_n_1867_1872+ lnbuilding_ft_blk_1867_1872
             , data=rdf6)
reg006 <- lm(lnvalue_building_ft  ~   burned_1869 + burned_1871+ burned_1872+ year_1871 +year_1872
             +lnbuilding_ft_n_1867_1869+lnbuilding_ft_blk_1867_1869+lnbuilding_ft_n_1867_1871
             + lnbuilding_ft_blk_1867_1871+lnbuilding_ft_n_1867_1872+lnbuilding_ft_blk_1867_1872
             , data=rdf5)
#>>>>>>>>>>>>>>>>>>>>>>>>>>>>>>>>>>>>>>>>>>>>>building_ft>>>>>>>>>>>>>>>>>>>>>>>>>>>>>>>>>>>>>>>>>>>>>>

#>>>>>>>>>>>>>>>>>>>>>>>>>>>>>>>>>>>>>>>building_ft>>>>>>>>>>>>>>>>>>>>>>>>>>>>>>>>>>>>>>>>>>>>>>>>>>>>
reg007 <- lm(lnvalue_building_ft  ~   burned_1871+ burned_1872 +year_1872
            +lnbuilding_ft_n_1869_1872+lnbuilding_ft_n_1867_1872+lnbuilding_ft_blk_1869_1872
            + lnbuilding_ft_blk_1867_1872+lnbuilding_ft_n_1869_1871+lnbuilding_ft_n_1867_1871
            +lnbuilding_ft_blk_1869_1871+lnbuilding_ft_blk_1867_1871 , data=rdf10)
reg008 <- lm(lnvalue_building_ft  ~ burned_1871+ burned_1872 +year_1872
             +lnbuilding_ft_n_1869_1872+lnbuilding_ft_n_1867_1872+lnbuilding_ft_blk_1869_1872
             +lnbuilding_ft_blk_1867_1872+lnbuilding_ft_n_1869_1871+lnbuilding_ft_n_1867_1871
             +lnbuilding_ft_blk_1869_1871+lnbuilding_ft_blk_1867_1871 , data=rdf9)
reg009 <- lm(lnvalue_building_ft  ~   burned_1871+ burned_1872 +year_1872
             +lnbuilding_ft_n_1869_1872+lnbuilding_ft_n_1867_1872+lnbuilding_ft_blk_1869_1872
             + lnbuilding_ft_blk_1867_1872+lnbuilding_ft_n_1869_1871+lnbuilding_ft_n_1867_1871
             +lnbuilding_ft_blk_1869_1871+lnbuilding_ft_blk_1867_1871 , data=rdf8)
```

```r
#>>>>>>>>>>>>>>>>>>>>>>>>>>>>>>>>>>>>>>>>>>>>>>building_ft>>>>>>>>>>>>>>>>>>>>>>>>>>>>>>>>>>>>>>>>>>>>>>>>>>>>


#>>>>>>>>>>>>>>>>>>>>>>>>>>>>>>>>>>>>>>building_ft>>>>>>>>>>>>>>>>>>>>>>>>>>>>>>>>>>>>>>>>>>>>>>>>>>>>>>>>
reg0010 <- lm(lnvalue_building_ft ~ burned_1872 + lnbuilding_ft_n_1871_1872
              +  lnbuilding_ft_n_1869_1872+lnbuilding_ft_n_1867_1872
              + lnbuilding_ft_blk_1871_1872+lnbuilding_ft_blk_1869_1872
              +lnbuilding_ft_blk_1867_1872 , data=rdf13)
reg0011 <- lm(lnvalue_building_ft ~ burned_1872 + lnbuilding_ft_n_1871_1872
              +  lnbuilding_ft_n_1869_1872+lnbuilding_ft_n_1867_1872
             + lnbuilding_ft_blk_1871_1872+lnbuilding_ft_blk_1869_1872
             +lnbuilding_ft_blk_1867_1872, data=rdf12)
reg0012 <- lm(lnvalue_building_ft ~ burned_1872 +lnbuilding_ft_n_1871_1872
              +lnbuilding_ft_n_1869_1872+lnbuilding_ft_n_1867_1872
             + lnbuilding_ft_blk_1871_1872+lnbuilding_ft_blk_1869_1872+lnbuilding_ft_blk_1867_1872
             , data=rdf11)
#>>>>>>>>>>>>>>>>>>>>>>>>>>>>>>>>>>>building_ft>>>>>>>>>>>>>>>>>>>>>>>>>>>>>>>>>>>>>>>>>>>>>>>>>>>>>>>>>>

#remaining columns

#>>>>>>>>>>>>>>>>>>>>>>>>>>>>>>>>>>>> land_ft>>>>>>>>>>>>>>>>>>>>>>>>>>>>>>>>>>>>>>>>>>>>>>>>>>>>>>>>>>>>>>
reg1 <- lm(lnvalue_land_ft  ~ burned_1867 + burned_1869+burned_1872+year_1869 +year_1872, data=rdf4)
reg2 <- lm(lnvalue_land_ft  ~ burned_1867 + burned_1869+burned_1872+year_1869+year_1872, data=rdf3)
reg3 <- lm(lnvalue_land_ft  ~ burned_1867+ burned_1869+burned_1872+year_1869 +year_1872, data=rdf2)
#>>>>>>>>>>>>>>>>>>>>>>>>>>>>>>>>>>>>>>  land_ft >>>>>>>>>>>>>>>>>>>>>>>>>>>>>>>>>>>>>>>>>>>>>>>>>>>>>>>>>>>>


#>>>>>>>>>>>>>>>>>>>>>>>>>>>>>>>>>>>> building_ft>>>>>>>>>>>>>>>>>>>>>>>>>>>>>>>>>>>>>>>>>>>>>>>>>>>>>>>
reg11 <- lm(lnvalue_building_ft ~ burned_1867 + burned_1869+burned_1872+year_1869 +year_1872, data=rdf4)

reg22 <- lm(lnvalue_building_ft ~ burned_1867 + burned_1869+burned_1872+year_1869 +year_1872, data=rdf3)

reg33 <- lm(lnvalue_building_ft ~ burned_1867 + burned_1869+burned_1872+year_1869+year_1872, data=rdf2)
#>>>>>>>>>>>>>>>>>>>>>>>>>>>>>>>>>>>>>>  building_ft>>>>>>>>>>>> >>>>>>>>>>>>>>>>>>>>>>>>>>>>>>>>>>>>>>>>>>>>

#>>>>>>>>>>>>>>>>>>>>>>>>>>>>>>>>>>>>>>>>>>>>>>land_ft>>>>>>>>>>>>>>>>>>>>>>>>>>>>>>>>>>>>>>>>>>>>>>>>>
reg4 <- lm(lnvalue_land_ft  ~   burned_1869  + burned_1872+ year_1869 +year_1872
            +lnland_ft_n_1867_1869+lnland_ft_blk_1867_1869+lnland_ft_n_1867_1871
            +lnland_ft_blk_1867_1871+lnland_ft_n_1867_1872 +lnland_ft_blk_1867_1872
            , data=rdf7)
reg5 <- lm(lnvalue_land_ft  ~ burned_1869  + burned_1872+ year_1869  +year_1872
            +lnland_ft_n_1867_1869+lnland_ft_blk_1867_1869+lnland_ft_n_1867_1871
            + lnland_ft_blk_1867_1871+lnland_ft_n_1867_1872+lnland_ft_blk_1867_1872
            , data=rdf6)
reg6 <- lm(lnvalue_land_ft  ~ burned_1869 + burned_1872+ year_1869+year_1872
            +lnland_ft_n_1867_1869+lnland_ft_blk_1867_1869+lnland_ft_n_1867_1871
            + lnland_ft_blk_1867_1871   +   lnland_ft_n_1867_1872  + lnland_ft_blk_1867_1872
            , data=rdf5)
#>>>>>>>>>>>>>>>>>>>>>>>>>>>>>>>>>>>>>>>>>>>>>>land_ft>>>>>>>>>>>>>>>>>>>>>>>>>>>>>>>>>>>>>>>>>>>>>>>>>>>>>>


#>>>>>>>>>>>>>>>>>>>>>>>>>>>>>>>>>>>>>>>>>>>>>>building_ft>>>>>>>>>>>>>>>>>>>>>>>>>>>>>>>>>>>>>>>>>>>>>>>>>
reg44 <- lm(lnvalue_building_ft  ~   burned_1869  + burned_1872+ year_1869  +year_1872
```

```r
            +lnbuilding_ft_n_1867_1869+lnbuilding_ft_blk_1867_1869 +lnbuilding_ft_n_1867_1871
            + lnbuilding_ft_blk_1867_1871+lnbuilding_ft_n_1867_1872+lnbuilding_ft_blk_1867_1872
            , data=rdf7)
reg55 <- lm(lnvalue_building_ft  ~burned_1869  + burned_1872+ year_1869  +year_1872
            +lnbuilding_ft_n_1867_1869+lnbuilding_ft_blk_1867_1869 +lnbuilding_ft_n_1867_1871
            + lnbuilding_ft_blk_1867_1871+lnbuilding_ft_n_1867_1872+lnbuilding_ft_blk_1867_1872
            , data=rdf6)
reg66 <- lm(lnvalue_building_ft  ~   burned_1869  + burned_1872+ year_1869  +year_1872
            +lnbuilding_ft_n_1867_1869+lnbuilding_ft_blk_1867_1869 +lnbuilding_ft_n_1867_1871
            + lnbuilding_ft_blk_1867_1871+lnbuilding_ft_n_1867_1872+lnbuilding_ft_blk_1867_1872
            , data=rdf5)
#>>>>>>>>>>>>>>>>>>>>>>>>>>>>>>>>>>>>>>>>>>>>>building_ft >>>>>>>>>>>>>>>>>>>>>>>>>>>>>>>>>>>>>>>>>>>>

#>>>>>>>>>>>>>>>>>>>>>>>>>>>>>>>>>>>>>>>land_ft>>>>>>>>>>>>>>>>>>>>>>>>>>>>>>>>>>>>>>>>>>>>>>>>>>>>
reg77 <- lm(lnvalue_land_ft  ~  burned_1872 +year_1872
           +lnland_ft_n_1869_1872  +lnland_ft_blk_1869_1872+ lnland_ft_n_1867_1872
           + lnland_ft_blk_1867_1872 +lnland_ft_n_1869_1871+lnland_ft_n_1867_1871
           +lnland_ft_blk_1869_1871+lnland_ft_blk_1867_1871,data=rdf10)
reg88 <- lm(lnvalue_land_ft  ~ burned_1872 +year_1872
           + lnland_ft_n_1869_1872 +lnland_ft_n_1867_1872+lnland_ft_blk_1869_1872
           + lnland_ft_blk_1867_1872+lnland_ft_n_1869_1871+lnland_ft_n_1867_1871
           +lnland_ft_blk_1869_1871+lnland_ft_blk_1867_1871 , data=rdf9)
reg99 <- lm(lnvalue_land_ft  ~ burned_1872 +year_1872
           +lnland_ft_n_1869_1872+lnland_ft_n_1867_1872+lnland_ft_blk_1869_1872
           + lnland_ft_blk_1867_1872+lnland_ft_n_1869_1871+lnland_ft_n_1867_1871
           +lnland_ft_blk_1869_1871+lnland_ft_blk_1867_1871 , data=rdf8)
#>>>>>>>>>>>>>>>>>>>>>>>>>>>>>>>>>>>>>>>>>>>>>land_ft>>>>>>>>>>>>>>>>>>>>>>>>>>>>>>>>>>>>>>>>>>>>>>>>


#>>>>>>>>>>>>>>>>>>>>>>>>>>>>>>>>>>>>>>>building_ft>>>>>>>>>>>>>>>>>>>>>>>>>>>>>>>>>>>>>>>>>>>>>>>>>>>
reg077 <- lm(lnvalue_building_ft  ~ burned_1872 +year_1872
            +lnbuilding_ft_n_1869_1872+lnbuilding_ft_n_1867_1872+ lnbuilding_ft_blk_1869_1872
            + lnbuilding_ft_blk_1867_1872+lnbuilding_ft_n_1869_1871+lnbuilding_ft_n_1867_1871
            +lnbuilding_ft_blk_1869_1871+lnbuilding_ft_blk_1867_1871 , data=rdf10)
reg088 <- lm(lnvalue_building_ft  ~ burned_1872 +year_1872
            +lnbuilding_ft_n_1869_1872+lnbuilding_ft_n_1867_1872+lnbuilding_ft_blk_1869_1872
            + lnbuilding_ft_blk_1867_1872+lnbuilding_ft_n_1869_1871+lnbuilding_ft_n_1867_1871
            +lnbuilding_ft_blk_1869_1871+lnbuilding_ft_blk_1867_1871 , data=rdf9)
reg099 <- lm(lnvalue_building_ft  ~ burned_1872+year_1872
            +lnbuilding_ft_n_1869_1872+lnbuilding_ft_n_1867_1872+lnbuilding_ft_blk_1869_1872
            + lnbuilding_ft_blk_1867_1872+lnbuilding_ft_n_1869_1871+lnbuilding_ft_n_1867_1871
            +lnbuilding_ft_blk_1869_1871+lnbuilding_ft_blk_1867_1871 , data=rdf8)
#>>>>>>>>>>>>>>>>>>>>>>>>>>>>>>>>>>>>>>>>>>>>>building_ft>>>>>>>>>>>>>>>>>>>>>>>>>>>>>>>>>>>>>>>>>>>>>>

#>>>>>>>>>>>>>>>>>>>>>>>>>>>>>>>>>>>>>>>>>>>>>>>>>>>>>>>>>>>>>>>>>>>>>>>>>>>>>>>>>>>>>>>>>>>>>>>>>>>>>>
#Table 1 Panel A reports the Pre-Fire differences in burned plots' land value
#Column 1 reports the cross-sectional estimates in each year
#Column 2 includes a main effect for burned region
#Replication for table 1 in the Paper
table_1PanelA<-stargazer(reg01,reg1,reg010,reg02,reg2,reg011,reg03,reg3,reg012,
  float=T,header = F, no.space= T,align = T, single.row = F, t.auto = F,
  p.auto = F, star.cutoffs = NA, column.sep.width = "-15pt",
  omit.stat = c("f", "ser","rsq"),omit = c("Constant", "Subject","year_1869","year_1871","year_1872","ln
```

```
covariate.labels = c("1867 X burned", "1869 X burned", "1871 X burned","1872 x burned"),
font.size = "small",keep.stat = "n",omit.table.layout = "n",
column.labels = c("", "Full Sample", "","", "Close Sample", "","", "Distant Sample", ""),
type = "text", title = "Table 1- PreFire Differences Between The Burned Area And Unburned Area",
dep.var.labels=c("Total House Value"), digits=2, out="table.text")
```

```
##
## Table 1- PreFire Differences Between The Burned Area And Unburned Area
## ================================================================================================
##                                          Dependent variable:
##               ---------------------------------------------------------------------------------
##                                          Total House Value
##                     Full Sample                Close Sample               Distant Sample
##                (1)       (2)      (3)     (4)       (5)       (6)     (7)       (8)        (9)
## ------------------------------------------------------------------------------------------------
## 1867 X burned  1.87     1.49              1.46      0.98              2.09       1.74
##               (0.03)   (0.04)            (0.04)    (0.04)            (0.02)     (0.03)
## 1869 X burned  0.96     1.06              0.40      0.49              1.42       1.54
##               (0.04)   (0.04)            (0.04)    (0.05)            (0.02)     (0.03)
## 1871 X burned  0.92                       0.37                        1.38
##               (0.04)                     (0.04)                      (0.02)
## 1872 x burned  0.90     1.01     -0.01    0.34      0.43     -0.004   1.37       1.50      -0.03
##               (0.04)   (0.04)    (0.01)  (0.04)    (0.05)    (0.01)  (0.02)     (0.03)     (0.01)
## ------------------------------------------------------------------------------------------------
## Observations  26,546   26,546    6,565   11,996    11,996    2,956   16,919     16,919     4,189
## ================================================================================================
```

```
#Table 1 Panel B reports the Pre-Fire differences in burned plots' land value Building value
table_1PanelB<-stargazer(reg001,reg11,reg0010,reg002,reg22,reg0011,reg003,reg33,reg0012,header = F,
no.space= T,align = T, single.row = F, t.auto = F,
p.auto = F, column.sep.width = "-24pt", omit.stat = c("f","ser","rsq"),omit = c("Constant", "Subject","y
covariate.labels = c("1867 x burned", "1869 X burned", "1871 X burned","1872 x burned"),
font.size = "small",keep.stat = "n",omit.table.layout = "n",
column.labels = c("", "Full Sample", "","", "Close Sample", "","", "Distant Sample", ""),
type = "text",add.lines = list(c("Year Fixed effects", "X", "X", "X", "X", "X", "X", "X", "X", "X"),
c("Burned region", "", "X", "X", "", "X", "X", "", "X", "X"),
c("year FE Xpre-1872 values", "", "", "X", "", "", "X", "", "", "X")),
star.cutoffs = NA, dep.var.labels=c("Log value of building per square foot"), digits=2)
```

```
##
## ================================================================================================
##                                          Dependent variable:
##                     ---------------------------------------------------------------------------
##                                  Log value of building per square foot
##                           Full Sample                Close Sample               Distant Sample
##                      (1)       (2)      (3)     (4)       (5)       (6)     (7)       (8)
## ------------------------------------------------------------------------------------------------
## 1867 x burned         0.98     0.75              0.78      0.44              1.08       0.90
##                      (0.03)   (0.04)            (0.04)    (0.04)            (0.03)     (0.03)
## 1869 X burned         0.79     0.86              0.39      0.46              1.13       1.20
##                      (0.04)   (0.04)            (0.04)    (0.04)            (0.04)     (0.04)
## 1871 X burned         0.79                       0.37                        1.14
##                      (0.04)                     (0.04)                      (0.04)
## 1872 x burned         0.82     0.89      0.03    0.41      0.47      0.03    1.17       1.23
```

```
##                          (0.04)   (0.04)    (0.02) (0.04)    (0.04)    (0.02) (0.04)     (0.04)
## ------------------------------------------------------------------------------------------------
## Year Fixed effects         X        X         X      X         X         X      X          X
## Burned region                       X         X              X         X                 X
## year FE Xpre-1872 values                      X                        X
## Observations             25,834   25,834    6,339  11,546    11,546    2,792  16,560     16,560
## ================================================================================================
```

```
#A regression of owner assets on distance to CBD and land value
regcbd <- lm(ownerassets ~    dist_to_cbd+lnvalue_land_ft , data=rdf13)
table_3<-stargazer(regcbd,header = F, no.space= T,align = T, single.row = F, t.auto = F,
                   p.auto = F, column.sep.width = "-15pt", omit.stat = c("f","ser"),
                   covariate.labels = c("Distance to CBD", "Land Value"),
                   font.size = "small", type = "text", dep.var.labels=c("Owner Assets"), digits=2)
```

```
##
## ===========================================
##                     Dependent variable:
##                   -------------------------
##                          Owner Assets
## -------------------------------------------
## Distance to CBD          -0.29***
##                           (0.06)
## Land Value              1,909.39***
##                           (54.86)
## Constant                14,318.18**
##                         (6,932.19)
## -------------------------------------------
## Observations               6,565
## R2                         0.16
## Adjusted R2                0.16
## ===========================================
## Note:           *p<0.1; **p<0.05; ***p<0.01
```

Table 3 is a supplementary linear regression which shows how the value of burned land plots and distance to CBD affects owner assets.In particular, an increase in distance to CBD reduces owner assets, while and increase in the value of burned land plots increase owner assets. Notable, the observations were weighted by plotsize.

```
library(tidyverse)
```

```
library(readr)
```

Cleaning Code for the 2012 dataset

```
AllParcels2012 <- read_csv("2012dataclean/AllParcels2012.txt")
AllParcels2012 <- AllParcels2012 %>% select(WARD, PARCEL, PID_LONG, SHAPE_area, point_x, point_y, fire_
  df <- data.frame(AllParcels2012)%>% #Creates a data frame#
  distinct()%>%# Removes duplicated values#
  rename_all(tolower) %>%
  mutate(pid_long=as.numeric(pid_long))%>%
  group_by(ward, parcel, pid_long) %>%
  summarize(fire_dist = mean(fire_dist), shape_area = mean(shape_area), point_x = mean(point_x), point_
```

```
SampleParcels <- read_csv("SampleParcels.csv")
df_2 <- data.frame(SampleParcels)%>%
```

```
  rename_all(tolower)%>%
  group_by(ward, parcel, pid_long)%>%
  summarize(samplearea = mean(samplearea))%>%
  mutate(pid_long=as.numeric(pid_long))
```

```
df_3 <- right_join(df_2, df,by = c("ward", "parcel", "pid_long")) %>%
  mutate (sample_frac= samplearea/shape_area) %>%
  mutate(sample_frac = ifelse(samplearea/shape_area > 1 & !is.na(samplearea/shape_area) , 1 ,sample_fra
  mutate(sample_frac = ifelse(is.na(samplearea/shape_area) , 0 ,sample_frac))
```

```
BurnedParcels <- read_csv("2012dataclean/BurnedParcels.txt")
df_4 <- data.frame(BurnedParcels)%>%
  rename_all(tolower)%>%
  group_by(ward, parcel, pid_long)%>%
  summarize(burnedarea = mean(burnedarea)) %>%
  mutate(pid_long=as.numeric(pid_long))
```

```
df_5 <- right_join(df_4, df_3,by = c("ward", "parcel", "pid_long"))%>%
  mutate (burned_frac= burnedarea/shape_area) %>%
  mutate(burned_frac = ifelse(is.na(burned_frac) , 0 ,burned_frac))
```

```
ConstructionParcels <- read_csv("2012dataclean/ConstructionParcels.txt")
df_6 <- data.frame(ConstructionParcels)%>%
  rename_all(tolower)%>%
  group_by(ward, parcel, pid_long)%>%
  summarize(constarea = mean(constarea)) %>%
  mutate(pid_long=as.numeric(pid_long))
```

```
df_7 <- right_join(df_6, df_5,by = c("ward", "parcel", "pid_long"))%>%
  mutate (const_frac= constarea/shape_area)%>%
  mutate(const_frac = ifelse(is.na(const_frac) , 0 ,const_frac))
```

```
SampleParcelCentroids <- read_csv("2012dataclean/SampleParcelCentroids.txt")%>%
  rename_all(tolower)%>%
  select(bad_points, block_id, wharf, dist_burne, burned, s_point_y, s_point_x, ward, parcel, pid_long)
```

```
df_8 <- data.frame(SampleParcelCentroids)%>%
  mutate(burnedarea = 0)%>%
  group_by(ward, parcel, pid_long)%>%
  summarize(s_point_x = mean(s_point_x),s_point_y = mean(s_point_y),burned = mean(burned),dist_burne = m
  mutate(pid_long = as.numeric(pid_long))
```

```
df_9 <- right_join(df_8, df_7,by = c("ward", "parcel", "pid_long"))%>%
  filter(!(pid_long == " ." ))
```

```
DATA2012_FULL <- read_csv("2012dataclean/DATA2012-FULL.txt")
DATA2012_FULL <- DATA2012_FULL %>% select(-(R_BLDG_STYL:U_FPLACE))
DATA2012_FULL <- DATA2012_FULL %>% select(-(MAIL_ADDRESS:MAIL_ZIPCODE))
df_10 <- data.frame(DATA2012_FULL) %>%
  rename_all(tolower)%>%
  mutate(st_num = str_remove_all(st_num," "))%>%
  mutate(st_name = str_remove_all(st_name," "))%>%
  mutate(st_name_SUF = str_remove_all(st_name_suf," "))%>%
  mutate(st_num = str_replace_all(st_num,"_ ", " - "))%>%
  mutate(st_num = str_replace_all(st_num," _"," - "))%>%
  group_by(pid, cm_id, st_num, st_name, st_name_suf, zipcode) %>%
```

```
  summarize(owner = first(owner),av_land = first(av_land),av_bldg = first(av_bldg), av_total = first(av
  mutate(cm_id =as.numeric(cm_id))

df_10$originalorder <- 1:nrow(df_10)
```

```
df_11 <-df_10 %>%
  mutate(pid_long = as.numeric(pid))%>%
  mutate(strpid = as.character(pid_long))%>%
  mutate(address =paste(st_num, st_name, st_name_suf, as.character(zipcode)))%>%
  mutate(condo_id= 0) %>%
  mutate(cm_id = ifelse(!(is.na(cm_id)), pid_long,cm_id))%>%
  group_by(address, condo_id)%>%
  mutate(condo_temp=ifelse(originalorder == 1, 1,condo_id)) %>%
  group_by(address)%>%
  mutate(condo_count=sum(condo_temp))
```

```
df_11 <-df_10 %>%
  mutate(pid_long = as.numeric(pid))%>%
  mutate(strpid = as.character(pid_long))%>%
  mutate(address =paste(st_num, st_name, st_name_suf, as.character(zipcode)))%>%
  mutate(condo_id= 0) %>%
  mutate(cm_id = ifelse(!(is.na(cm_id)), pid_long,cm_id))%>%
  group_by(address, condo_id)%>%
  mutate(condo_temp=ifelse(originalorder == 1, 1,condo_id)) %>%
  group_by(address)%>%
  mutate(condo_count=sum(condo_temp))%>%
  mutate(pid_long = ifelse(pid_long == 0302953018, 302953010,pid_long ))%>%
  mutate( pid_long = ifelse(pid_long == 305358202, 305358000 ,pid_long ))%>%
  mutate( pid_long = ifelse( pid_long == 305424300 | pid_long == 305424030,305424020, pid_long ))%>%
  mutate( pid_long = ifelse( pid_long == 303041300 | pid_long == 303041010,303041000, pid_long ))%>%
  mutate( pid_long = ifelse( pid_long == 304304402 | pid_long == 304304401,304304400, pid_long ))%>%
  mutate( pid_long = ifelse(pid_long == 30511201 |pid_long == 305112012,305112010, pid_long ))%>%
  mutate( pid_long = ifelse( pid_long == 304826012 | pid_long == 304826014, 304826010, pid_long ))%>%
  mutate( pid_long = ifelse(pid_long == 500043011, 500043010,pid_long ))%>%
  mutate( pid_long = ifelse(pid_long == 304133001, 304133000,pid_long ))%>%
  mutate( pid_long = ifelse(pid_long ==  301674001, 301674000,pid_long ))%>%
  mutate( pid_long = ifelse(pid_long == 500001001, 500001000,pid_long ))%>%
  mutate( pid_long = ifelse(pid_long== 305651001, 305651000,pid_long ))%>%
  mutate( pid_long= ifelse(pid_long== 500045001, 500045000,pid_long))%>%
  mutate( pid_long = ifelse(pid_long == 304500200, 304500000,pid_long ))%>%
  mutate( pid_long = ifelse(pid_long == 304890100, 304890000,pid_long))%>%
  mutate( pid_long = ifelse(pid_long == 304692051, 304692050,pid_long ))%>%
  mutate( pid_long = ifelse(pid_long == 305380001, 305380000,pid_long))%>%
  mutate( pid_long = ifelse(pid_long == 304893001, 304893000,pid_long))%>%
  mutate( pid_long = ifelse(pid_long ==  302862001, 302862000,pid_long ))%>%
  mutate( pid_long = ifelse(pid_long == 304788001, 304788000,pid_long ))%>%
  mutate( pid_long = ifelse(pid_long == 304102001, 304102000,pid_long ))%>%
  mutate( pid_long = ifelse(pid_long == 304605001, 304605000,pid_long ))%>%
  mutate( pid_long = ifelse(pid_long== 304692050, 304692000,pid_long ))%>%
  mutate( pid_long = ifelse(pid_long == 304821001, 304821000,pid_long ))%>%
  mutate( pid_long = ifelse(pid_long == 304841001, 304841000 ,pid_long ))%>%
  mutate( pid_long = ifelse(pid_long == 304860001, 304860000,pid_long ))%>%
  mutate( pid_long = ifelse(pid_long == 305106001, 305106000,pid_long ))%>%
  mutate( pid_long = ifelse(pid_long == 305107001, 305107000 ,pid_long ))%>%
```

```
  mutate( pid_long = ifelse(pid_long == 305777001, 305777000,pid_long ))%>%
  mutate( pid_long = ifelse(pid_long == 302952014, 302952010,pid_long ))%>%
  mutate( pid_long = ifelse(pid_long== 303028500, 303028300,pid_long ))%>%
  mutate( pid_long = ifelse(pid_long == 305107001, 305107000 ,pid_long ))%>%
  mutate(pid_long = ifelse(pid_long == 303740000, 303747000,pid_long ))%>%
  mutate(pid_long = ifelse( pid_long == 304870400 | pid_long == 304870020, 304870010, pid_long ))%>%
  mutate(cm_id = ifelse(cm_id == 303740000, 303747000,cm_id ))%>%
  mutate(pid_long = ifelse( pid_long == 304832420 | pid_long == 304832400| pid_long == 304832020, 30483
  mutate(pid_long = ifelse( substr(strpid, 1, 6) == "305378" | substr(strpid, 1, 6) ==  "305379", 30537
  mutate(pid_long = ifelse( substr(strpid, -1, 1) == "1" & st_name == "HARRISON", pid_long-1, pid_long
  select(-strpid)
```

Cleaning Road Data

```
X1867_Burned <- read_csv("Road width clean/1867_Burned.csv")%>%
  rename_all(tolower)%>%
  mutate(burned=1)

X1867_Unburned <- read_csv("Road width clean/1867_Unburned.csv")%>%
  rename_all(tolower)%>%
  mutate(burned=0)

rb01<-rbind(X1867_Unburned, X1867_Burned)%>%
  mutate(year=1867)%>%
  mutate(width=ifelse(roadw_1867!=0,roadw_1867,0 ))%>%
  mutate(width=ifelse(roadw_67!=0,(width+roadw_67)/2,width ))%>%
  select(objectid, full_name, length,burned, width, year )

#%%%%%%%%%%%%%%%1867%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%


#%%%%%%%%%%%%%%%1873%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%
library(readr)
X1873_Burned <- read_csv("Road width clean/1873_Burned.csv")%>%
  rename_all(tolower)%>%
  mutate(burned=1)

X1873_Unburned <- read_csv("Road width clean/1873_Unburned.csv")%>%
  rename_all(tolower)%>%
  mutate(burned=0)
rb02<-rbind(X1873_Unburned, X1873_Burned)%>%
  mutate(length=shape_le_1)%>%
  mutate(year=1873)%>%
  mutate(width=ifelse(roadw_1873 !=0,roadw_1873 ,0 ))%>%
  mutate(width=ifelse(roadw_73 !=0,(width+roadw_73)/2,width ))%>%
  select(objectid, full_name, length,burned, width, year )

rb03<-rbind(rb02, rb01)

#%%%%%%%%%%%%%%%1873%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%


#%%%%%%%%%%%%%%%1882%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%
```

```
X1882_Burned <- read_csv("Road width clean/1882_Burned.csv")%>%
  rename_all(tolower)%>%
  mutate(burned=1)

X1882_Unburned <- read_csv("Road width clean/1882_Unburned.csv")%>%
  rename_all(tolower)%>%
  mutate(burned=0)

rb04<-rbind(X1882_Unburned, X1882_Burned)%>%
  mutate(length=shape_le_1)%>%
  mutate(year=1882)%>%
  mutate(width=ifelse(roadw_1882!=0,roadw_1882,0 ))%>%
  mutate(width=ifelse(roadw_82!=0,(width+roadw_82)/2,width ))%>%
  select(objectid, full_name, length,burned, width, year )

rb05<-rbind(rb04, rb03)
#%%%%%%%%%%%%%%%%1882%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%

#%%%%%%%%%%%%%%%%1895%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%
X1890_Burned <- read_csv("Road width clean/1890_Burned.csv")%>%
  rename_all(tolower)%>%
  mutate(burned=1)
X1890_Unburned <- read_csv("Road width clean/1890_Unburned.csv")%>%
  rename_all(tolower)%>%
  mutate(burned=0)

rb06<-rbind(X1890_Unburned, X1890_Burned)%>%
  mutate(length=shape_le_1)%>%
  mutate(year=1895)%>%
  mutate(width=ifelse(roadw_1880!=0,roadw_1880,0 ))%>%
  mutate(width=ifelse(roadw_80!=0,(width+roadw_80)/2,width ))%>%
  select(objectid, full_name, length,burned, width, year )

rb07<-rbind(rb06, rb05)
#%%%%%%%%%%%%%%%%1890%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%



#%%%%%%%%%%%%%%%%2014%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%
library(plyr)
Modern_Burned <- read_csv("Road width clean/Modern_Burned.csv")%>%
  rename_all(tolower)%>%
  mutate(burned=1)
Modern_Unburned <- read_csv("Road width clean/Modern_Unburned.csv")%>%
  rename_all(tolower)%>%
  mutate(burned=0)
rb08<-rbind(Modern_Unburned, Modern_Burned)%>%
  mutate(width = rightsidew+ rightshoul+ medianwidt+ leftsidewa+ leftshould+ surfacewid)%>%
  mutate(width2 = rightofway)%>%
  mutate(year=2014)%>%
  select( length, burned, width,width2, year)
```

```r
rb09<-rbind.fill(rb08, rb07)


#%%%%%%%%%%%%%2014%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%


#%%%%%%%%%%%%%1882%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%
DistToFire_Burned <- read_csv("Road width clean/DistToFire_Burned.csv")%>%
  rename_all(tolower)%>%
  select(-objectid)%>%
  mutate(objectid=oid_save)%>%
  mutate(objectid=objectid+1)%>%
  select(objectid, near_dist, shape_length)%>%
  mutate(dist_sl=shape_length)%>%
  mutate(burned=1)
rw1 <- right_join(DistToFire_Burned, rb09, by = c("objectid", "burned"))

DistToFire_Unburned <- read_csv("Road width clean/DistToFire_Unburned.csv")%>%
  rename_all(tolower)%>%
  select(-objectid)%>%
  mutate(near_distu=near_dist)%>%
  mutate(objectid=oid_save)%>%
  mutate(objectid=objectid+1)%>%
  select(objectid, near_distu, shape_length)%>%
  mutate(dist_sl=shape_length)%>%
  mutate(burned=0)
rw2 <- right_join(DistToFire_Unburned, rw1, by = c("objectid", "burned"))
#%%%%%%%%%%%%%1882%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%
```