Log vs Linear Model

```
library(tidyverse)
```

```
## -- Attaching packages ------- tidyverse 1.2.1 --
```

```
## v ggplot2 2.2.1     v purrr   0.2.4
## v tibble  1.4.2     v dplyr   0.7.5
## v tidyr   0.8.1     v stringr 1.3.1
## v readr   1.1.1     v forcats 0.3.0
```

```
## -- Conflicts ---------- tidyverse_conflicts() --
## x dplyr::filter() masks stats::filter()
## x dplyr::lag()    masks stats::lag()
```

```
y2 <- read.csv("~/../Dropbox/negative_population_trends/10ksims_freq1_spp20_nyears2.csv")
y5 <- read.csv("~/../Dropbox/negative_population_trends/10ksims_freq1_spp20_nyears5.csv")
y10 <- read.csv("~/../Dropbox/negative_population_trends/10ksims_freq1_spp20_nyears10.csv")
y20 <- read.csv("~/../Dropbox/negative_population_trends/10ksims_freq1_spp20_nyears20.csv")
y50 <- read.csv("~/../Dropbox/negative_population_trends/10ksims_freq1_spp20_nyears50.csv")
y100 <- read.csv("~/../Dropbox/negative_population_trends/10ksims_freq1_spp20_nyears100.csv")

y2 %>% group_by(bar, model) %>%
  summarize(samplesize=n(),
            negativebeta = sum(beta<0),
            percent = negativebeta/samplesize*100)
```

```
## # A tibble: 4 x 5
## # Groups:   bar [?]
##   bar                                model samplesize negativebeta percent
##   <fct>                              <fct>      <int>        <int>   <dbl>
## 1 True Population Size, 2 Highest P~ line~      20000        16305    81.5
## 2 True Population Size, 2 Highest P~ log        20000        16912    84.6
## 3 True Population Size, 2 Random Po~ line~      20000        10043    50.2
## 4 True Population Size, 2 Random Po~ log        20000         9972    49.9
```

```
y5 %>% group_by(bar, model) %>%
  summarize(samplesize=n(),
            negativebeta = sum(beta<0),
            percent = negativebeta/samplesize*100)
```

```
## # A tibble: 4 x 5
## # Groups:   bar [?]
##   bar                                model samplesize negativebeta percent
##   <fct>                              <fct>      <int>        <int>   <dbl>
## 1 True Population Size, 2 Highest P~ line~      20000        18085    90.4
## 2 True Population Size, 2 Highest P~ log        20000        18036    90.2
## 3 True Population Size, 2 Random Po~ line~      20000         9930    49.6
## 4 True Population Size, 2 Random Po~ log        20000         9920    49.6
```

```
y10 %>% group_by(bar, model) %>%
  summarize(samplesize=n(),
            negativebeta = sum(beta<0),
            percent = negativebeta/samplesize*100)
```

```
## # A tibble: 4 x 5
```

```
## # Groups:   bar [?]
##   bar                                model samplesize negativebeta percent
##   <fct>                              <fct>      <int>        <int>   <dbl>
## 1 True Population Size, 2 Highest P~ line~      20000        17159    85.8
## 2 True Population Size, 2 Highest P~ log        20000        17676    88.4
## 3 True Population Size, 2 Random Po~ line~      20000         9901    49.5
## 4 True Population Size, 2 Random Po~ log        20000         9992    50.0
```

```
y20 %>% group_by(bar, model) %>%
  summarize(samplesize=n(),
            negativebeta = sum(beta<0),
            percent = negativebeta/samplesize*100)
```

```
## # A tibble: 4 x 5
## # Groups:   bar [?]
##   bar                                model samplesize negativebeta percent
##   <fct>                              <fct>      <int>        <int>   <dbl>
## 1 True Population Size, 2 Highest P~ line~      20000        15692    78.5
## 2 True Population Size, 2 Highest P~ log        20000        16090    80.4
## 3 True Population Size, 2 Random Po~ line~      20000        10041    50.2
## 4 True Population Size, 2 Random Po~ log        20000         9998    50.0
```

```
y50 %>% group_by(bar, model) %>%
  summarize(samplesize=n(),
            negativebeta = sum(beta<0),
            percent = negativebeta/samplesize*100)
```

```
## # A tibble: 4 x 5
## # Groups:   bar [?]
##   bar                                model samplesize negativebeta percent
##   <fct>                              <fct>      <int>        <int>   <dbl>
## 1 True Population Size, 2 Highest P~ line~      20000        13732    68.7
## 2 True Population Size, 2 Highest P~ log        20000        13882    69.4
## 3 True Population Size, 2 Random Po~ line~      20000        10038    50.2
## 4 True Population Size, 2 Random Po~ log        20000        10056    50.3
```

```
y100 %>% group_by(bar, model) %>%
  summarize(samplesize=n(),
            negativebeta = sum(beta<0),
            percent = negativebeta/samplesize*100)
```

```
## # A tibble: 4 x 5
## # Groups:   bar [?]
##   bar                                model samplesize negativebeta percent
##   <fct>                              <fct>      <int>        <int>   <dbl>
## 1 True Population Size, 2 Highest P~ line~      20000        12825    64.1
## 2 True Population Size, 2 Highest P~ log        20000        13006    65.0
## 3 True Population Size, 2 Random Po~ line~      20000         9995    50.0
## 4 True Population Size, 2 Random Po~ log        20000         9948    49.7
```