Convergence figure 5

Ari Anisfeld

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```
knitr::opts_chunk$set(echo = TRUE)
library(tidyverse)
library(yaml)
library(rprojroot)
library(broom)

make_path <- is_git_root$make_fix_file()
CONFIG <- yaml.load_file(make_path("journalist/eduardo_porter/code/config.yml"))
out_path <- make_path("journalist/eduardo_porter/out")
source(str_c(CONFIG$lab_code, "prelim.R"))
```

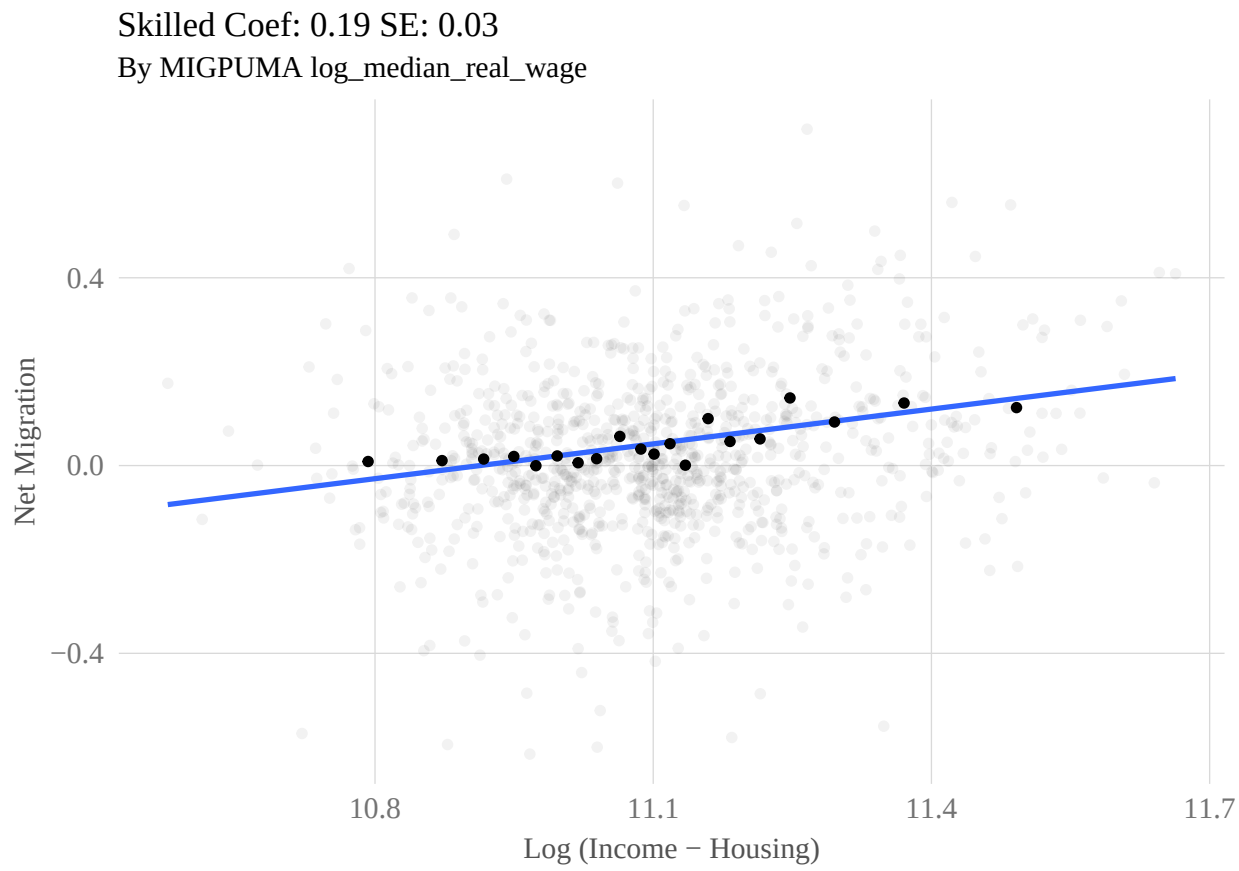
```
# NEED TO UPDATE PATHS WHEN/IF MOVE TO SCRIPT
migpuma_high <- read_csv("../out/high_skill_migration_by_migpuma.csv")
migpuma_low <- read_csv("../out/low_skill_migration_by_migpuma.csv")
msa_high <- read_csv("../out/high_skill_migration_by_msa.csv")
msa_low <- read_csv("../out/low_skill_migration_by_msa.csv")
```

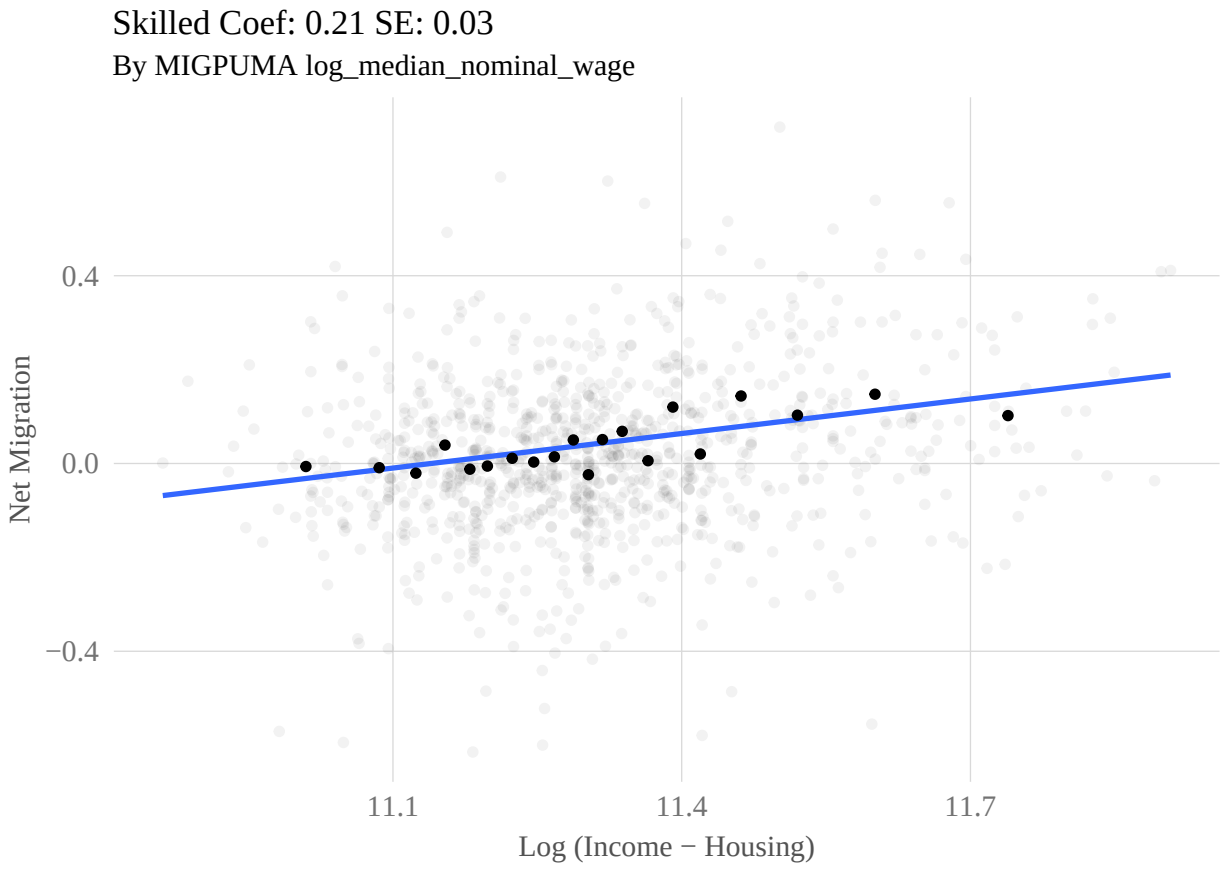
```
prepare_data <- function(data, name, place_type){
  data %>%
    select(starts_with(place_type), `net migration`,
           starts_with("median"), starts_with("mean")) %>%
    mutate(skill = name,
           net_migration = `net migration`*100,
           log_median_real_wage = log(median_real_wage),
           log_median_nominal_wage = log(median_nominal_wage),
           log_mean_real_wage = log(mean_real_wage),
           log_mean_nominal_wage = log(mean_nominal_wage)
           )
}


get_model_as_title <- function(tidy_model, group="", round_to=2) {

    stopifnot( nrow(tidy_model) == 2)
    tidy_model <- tidy_model %>%
                    filter(term != "(Intercept)") %>%
                    transmute(Coef = estimate,
                              SE = std.error) %>%
                    round(round_to)


    title = group
    for(col in names(tidy_model)){
      title = glue::glue("{title} {col}: {tidy_model[, col]}")
    }

  title
```

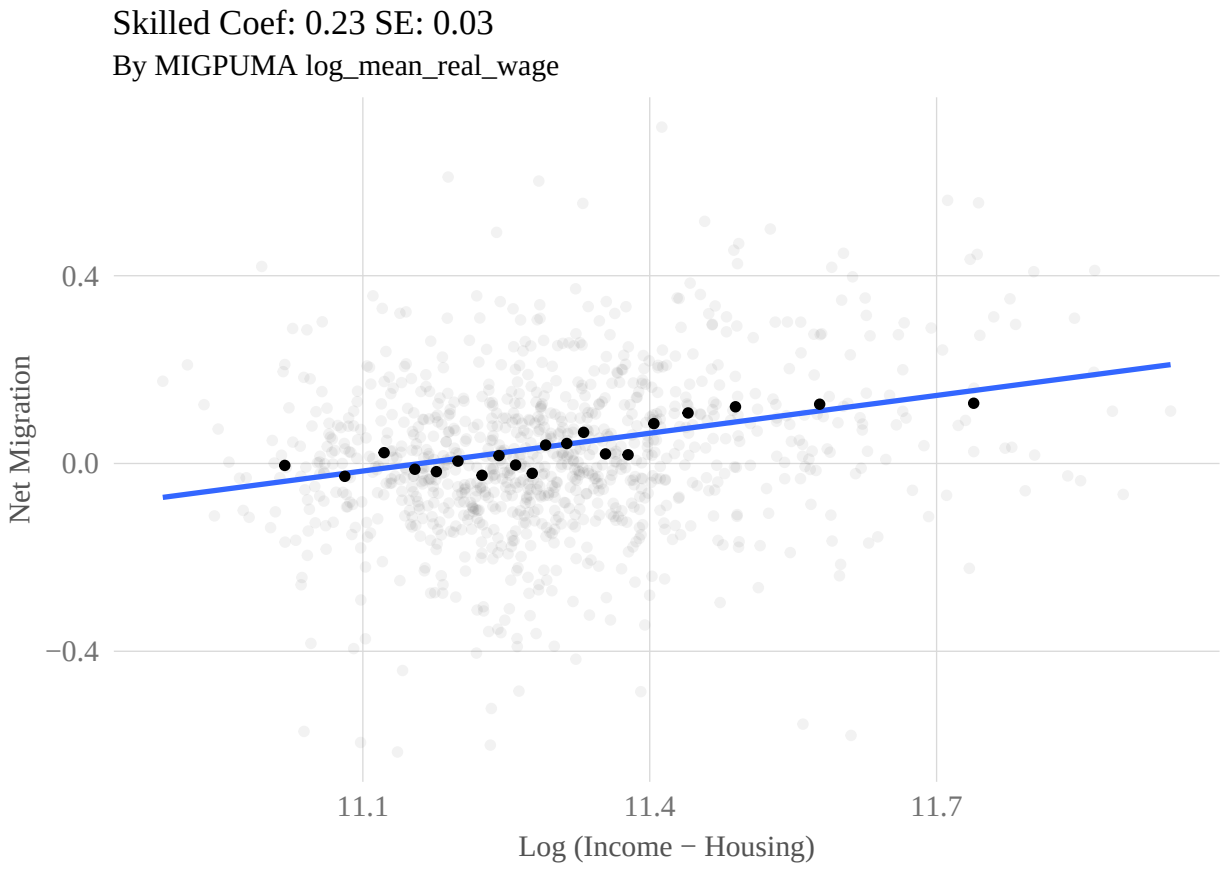
```
}

make_plot <- function(data=migpuma_plot,
                      skill.="Skilled",
                      wage_type="log_median_real_wage",
                      weights. = "migpuma_population"){

  filtered_data <- data %>% filter(skill==skill.)

  binscatter_output <-
    filtered_data %>%
      binscatter(df = .,
                 x = wage_type,
                 y = "net_migration",
                 group = "skill",
                 weights = weights.
    )



  model <- lm(as.formula(str_c("net_migration~", wage_type)), data = filtered_data)
  tidy_model <- tidy(model)

  filtered_data %>%
    ggplot(
      aes(x=!!sym(wage_type), y=net_migration)
      ) +
        geom_point(alpha=.05) +
        geom_smooth(method = "lm",
                    mapping = aes(weight = !!sym(weights.)),
                    se = FALSE) +
        geom_point(data = binscatter_output$df_bin,
                   aes(x, y)) +

        fte_theme() +
        labs(x = "Log (Income - Housing)",
             y = "Net Migration",
             title=get_model_as_title(tidy_model, group=skill.))
}


migpuma_plot <-
  migpuma_high %>%
  prepare_data("Skilled", "migpuma") %>%
    bind_rows(
      migpuma_low %>%
        prepare_data("Unskilled", "migpuma")
    )


wage_list <- migpuma_plot %>% select(contains("log")) %>% names()

for (skill in c("Skilled", "Unskilled")) {
```

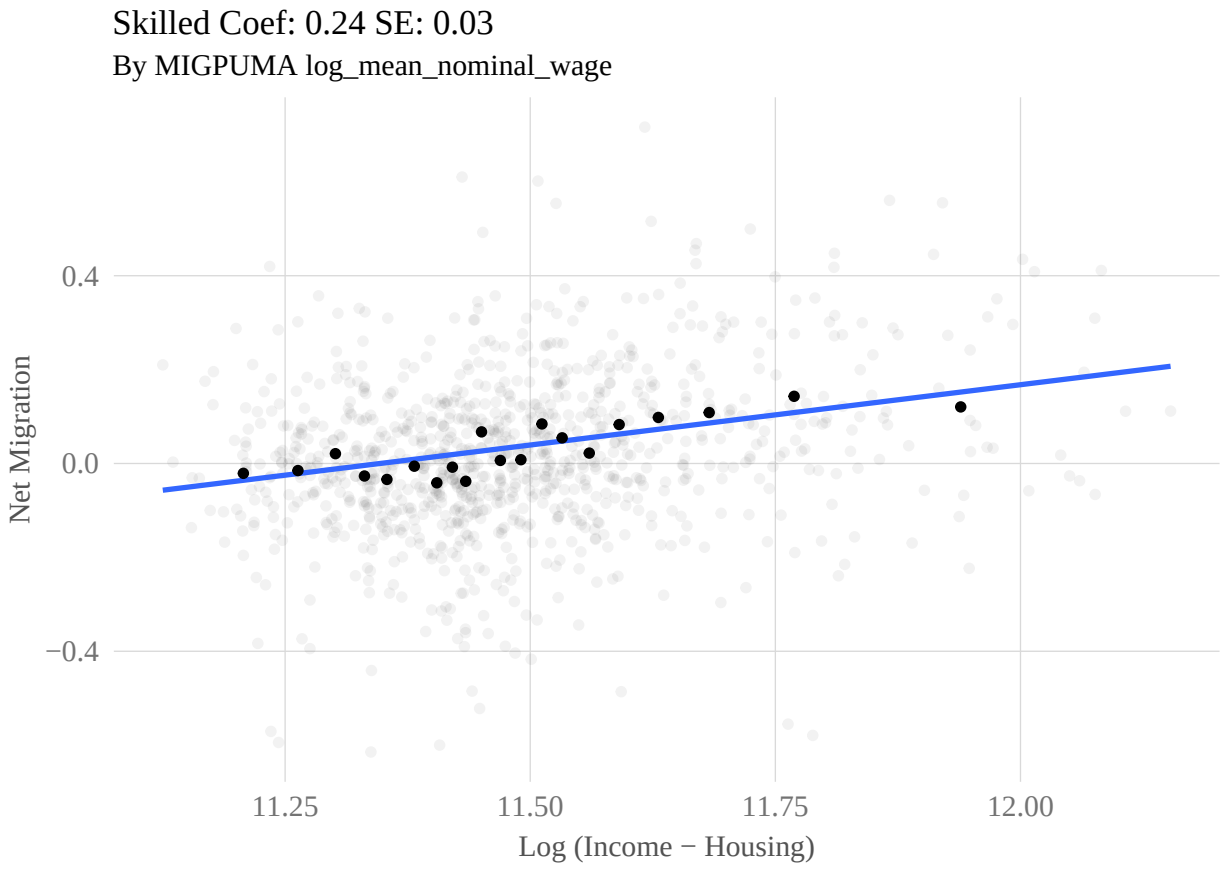
```
  for (wage in wage_list){
    print(migpuma_plot %>% make_plot(skill. = skill, wage_type= wage, data = .) +
            labs(subtitle = str_c("By MIGPUMA ", wage)))
  }
}
```

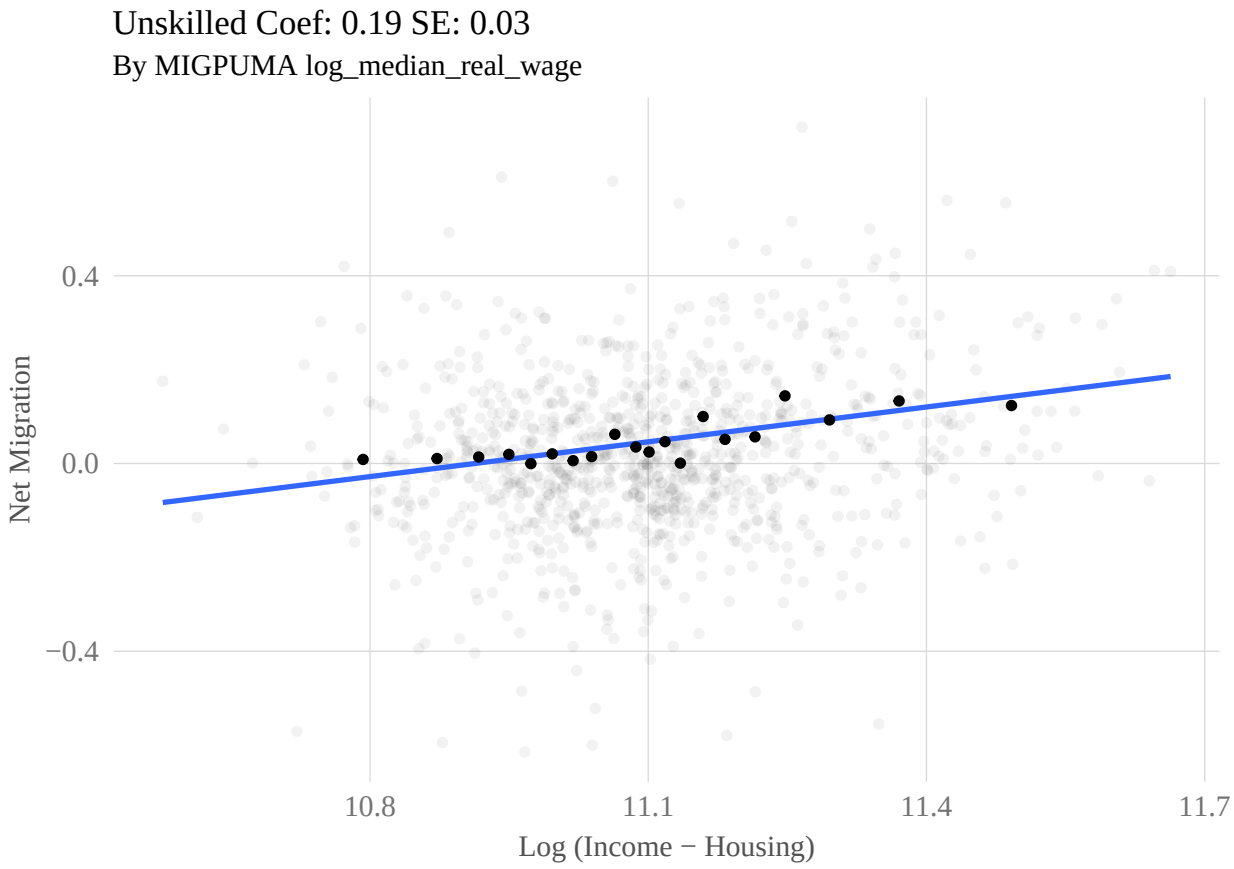
```
## Loading required package: multiwayvcov
```

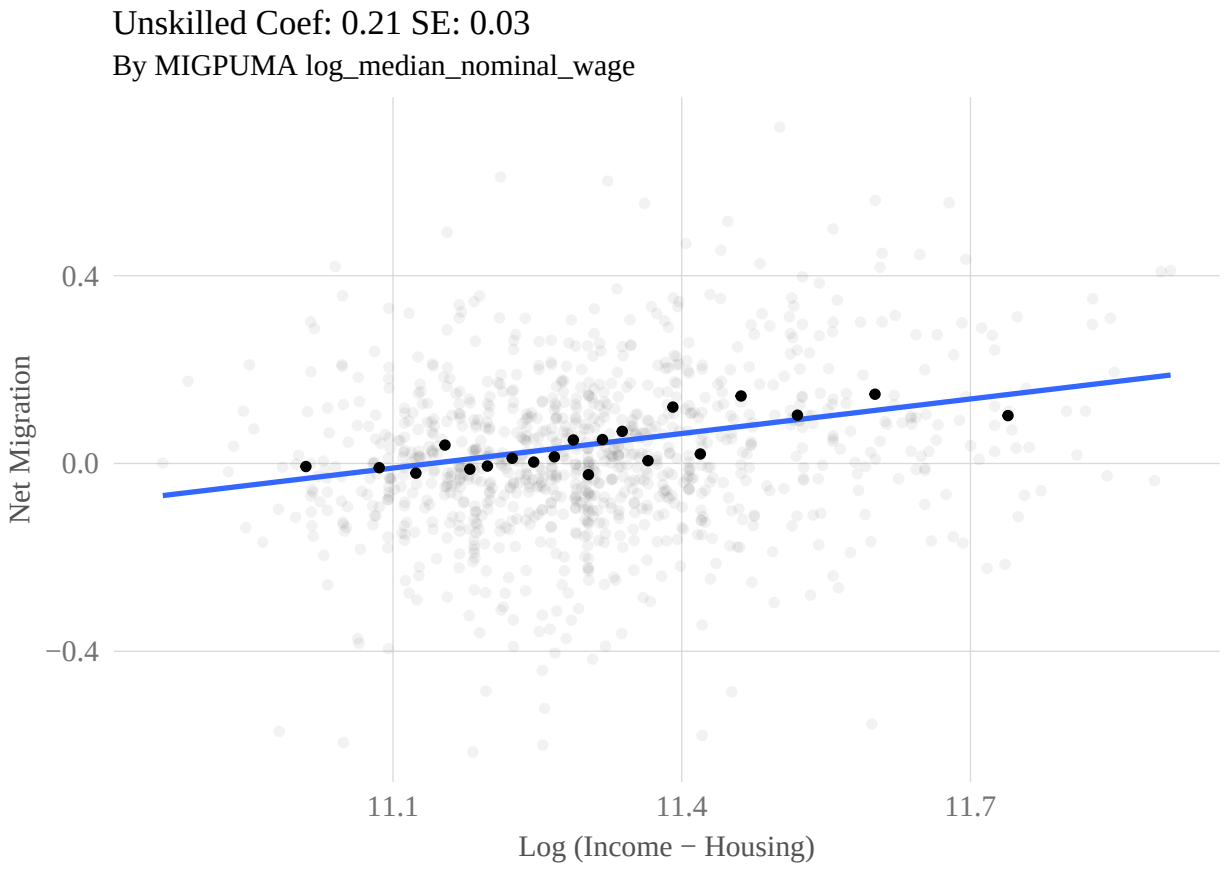


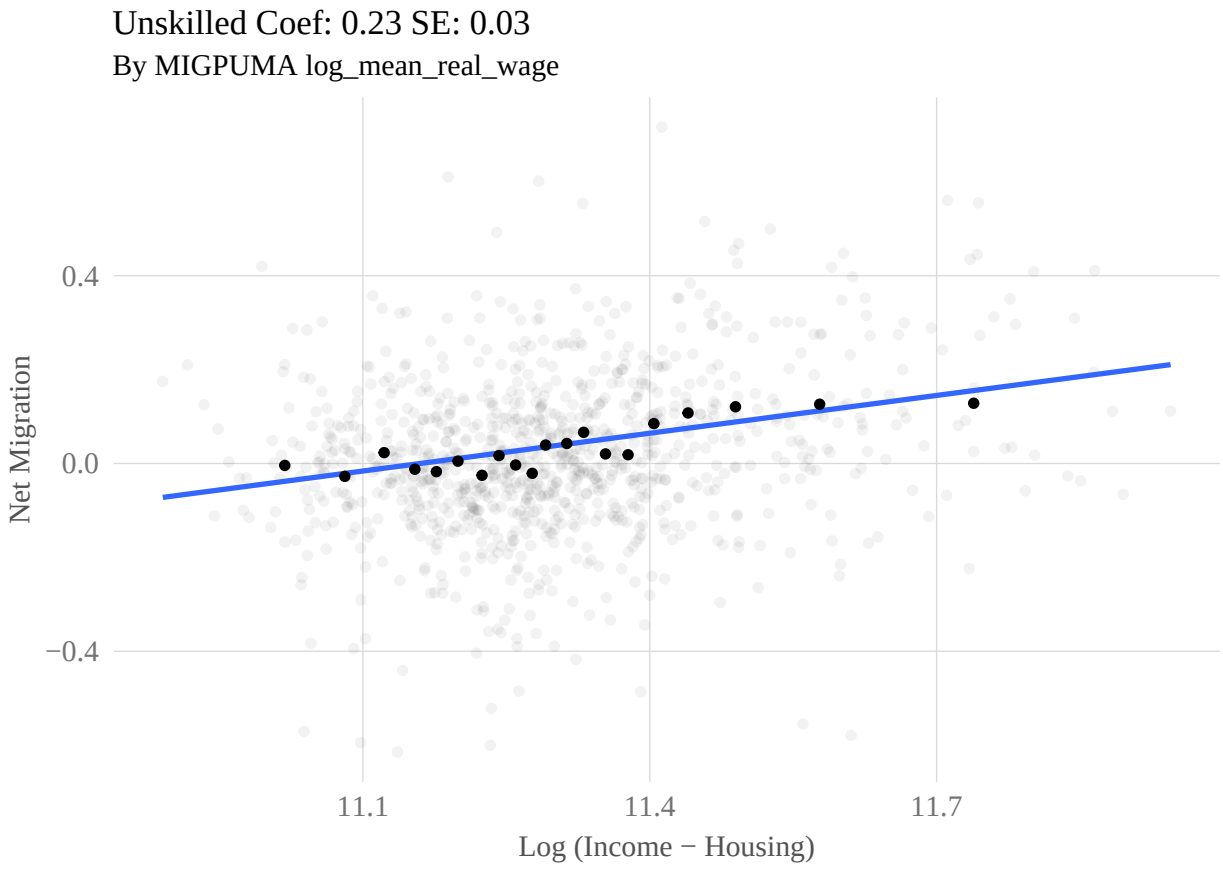

Skilled Coef: 0.21 SE: 0.03
By MIGPUMA log_median_nominal_wage
0.4
0.0
−0.4
Net Migration
11.1
11.4
11.7
Log (Income − Housing)

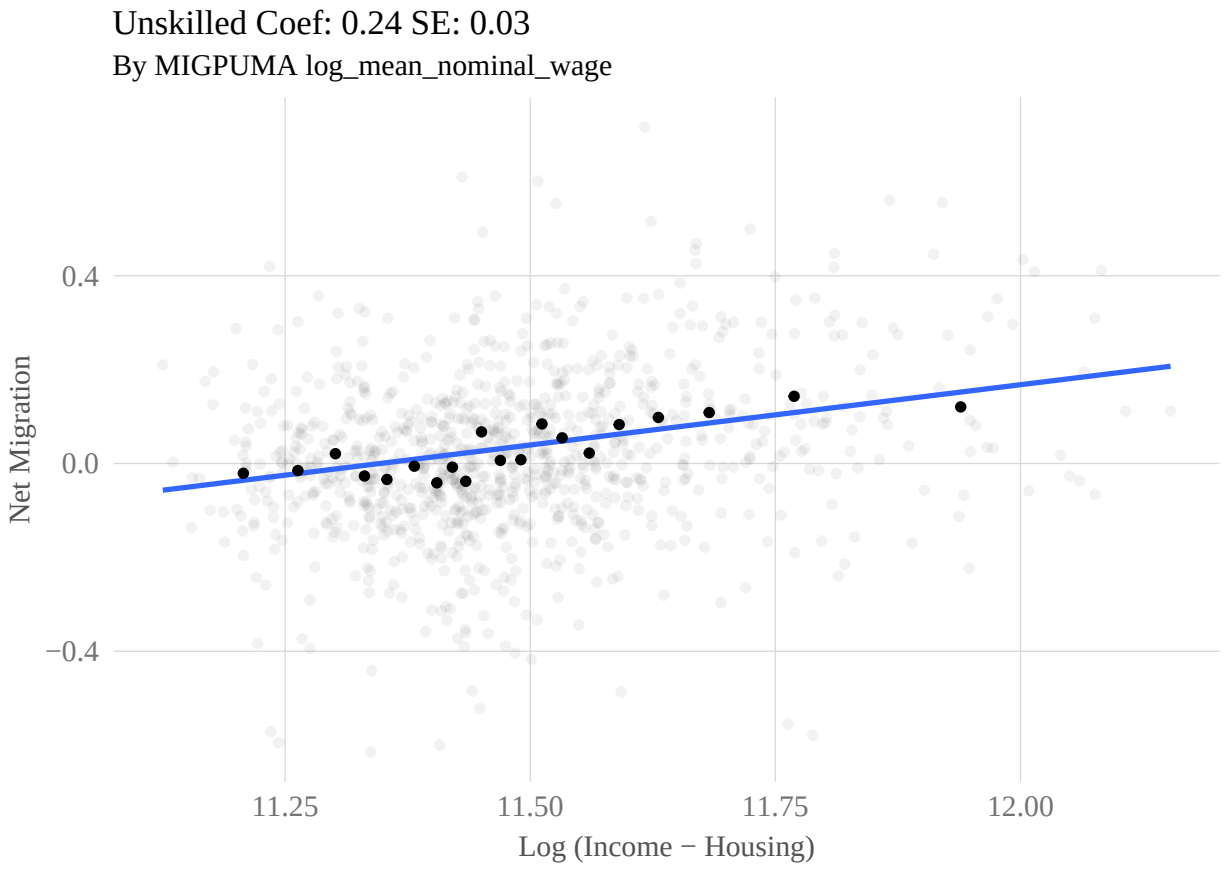

Skilled Coef: 0.23 SE: 0.03
By MIGPUMA log_mean_real_wage
0.4
0.0
−0.4
Net Migration
11.1
11.4
11.7
Log (Income − Housing)


Skilled Coef: 0.24 SE: 0.03
By MIGPUMA log_mean_nominal_wage
Net Migration
0.4
0.0
−0.4
11.25
11.50
11.75
12.00
Log (Income − Housing)


Unskilled Coef: 0.19 SE: 0.03
By MIGPUMA log_median_real_wage
Net Migration
0.4
0.0
−0.4
10.8
11.1
11.4
11.7
Log (Income − Housing)


Unskilled Coef: 0.21 SE: 0.03
By MIGPUMA log_median_nominal_wage
0.4
0.0
−0.4
Net Migration
11.1
11.4
11.7
Log (Income − Housing)


Unskilled Coef: 0.23 SE: 0.03
By MIGPUMA log_mean_real_wage
0.4
0.0
−0.4
Net Migration
11.1
11.4
11.7
Log (Income − Housing)



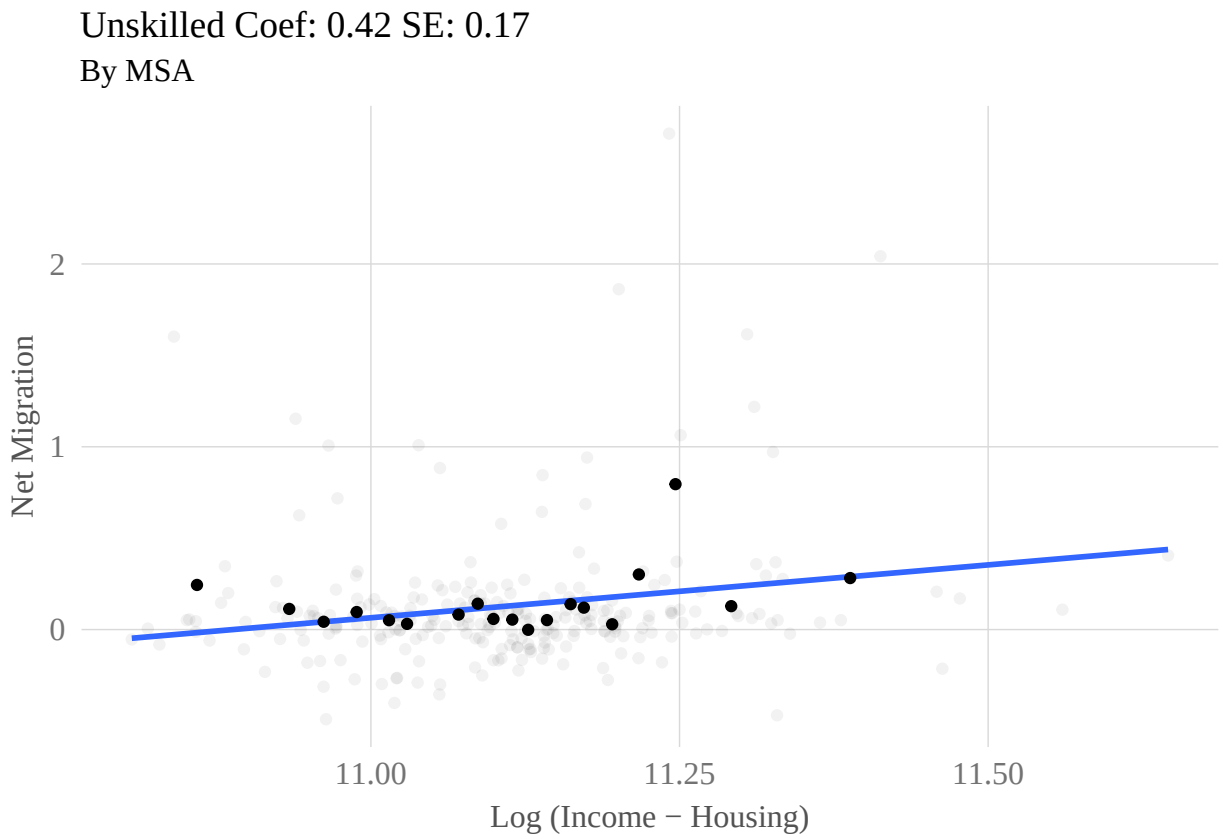
Alternative for MSAs

```
msa_plot <-
  msa_high %>%
    prepare_data("Skilled", "MSA")%>%
  bind_rows(
    msa_low %>%
      prepare_data("Unskilled", "MSA")
  )

# have not accounted for MSAs that were not assigned MIGPUMAs.
msa_plot %>% make_plot(skill. = "Unskilled", data = .,  weights. = "MSA 2010 Population") + labs(subtit
```

```
## Warning: Removed 1 rows containing non-finite values (stat_smooth).
```

```
## Warning: Removed 1 rows containing missing values (geom_point).
```

```
## Warning: Removed 1 rows containing missing values (geom_point).
```




```
msa_plot %>% make_plot(skill. = "Skilled", data = .,  weights. = "MSA 2010 Population") + labs(subtitle
```

```
## Warning: Removed 1 rows containing non-finite values (stat_smooth).
```

```
## Warning: Removed 1 rows containing missing values (geom_point).
```

```
## Warning: Removed 1 rows containing missing values (geom_point).
```

Skilled Coef: 0.42 SE: 0.17

By MSA