China Fit

Loading Dependencies

```
# General purpose  data-wranglinglibraries
library(tidyverse)
library(readr)
# Pretty print tables
library(knitr)
# The methodology in Prof. Milvesky paper
source("../../scripts/00_method.R")
```

Loading Data

```
df <- bind_rows(
  read_table2("../../data/00_raw/china/group1.tsv") %>% mutate(Sector="1"),
  read_table2("../../data/00_raw/china/group2.tsv") %>% mutate(Sector="2"),
  read_table2("../../data/00_raw/china/group3.tsv") %>% mutate(Sector="3"),
  read_table2("../../data/00_raw/china/group4.tsv") %>% mutate(Sector="4"),
  read_table2("../../data/00_raw/china/group5.tsv") %>% mutate(Sector="5")
) %>%
  # only keep the Sector, Age and qx columns
  select(Sector, Age, qx)
```

Compute Stages

```
df %>%
  # Filter for age-range
  filter(between(Age, 35, 95)) %>%
  # Apply stage 1 to each sector
  group_by(Sector) %>%
  compute_stage1 ->
  Stage1_model

# Compute last two stages
Stage1_model %>% compute_stage2 -> Stage2_model
Stage2_model %>% compute_stage3 -> Stage3_model
```

Output

Table 1

```
Stage1_model %>%
  mutate( g = g %>% percent(accuracy = 0.001) ) %>%
  mutate( l_m = l_m*10^5 ) %>%
  mutate_if(is.numeric, ~round(., 3)) %>%
  select(Sector, lnh, l_m, g, m, b) %>% kable
```

Sector	lnh	l_m	g	m	b
1	-11.325	1	10.622%	85.510	9.414
2	-11.645	1	11.033%	85.570	9.064
3	-12.004	1	11.338%	86.671	8.820
4	-12.133	4	11.513%	86.611	8.686
5	-11.777	10	10.874%	87.894	9.196

Table 2

Regression Coefficients

```
tibble(Coefficients = c("L", "-x*")) %>%
  bind_cols( as_tibble(Stage2_model$model[[1]]$coefficients ) ) %>%
  mutate_if(is.numeric, ~round(., 3)) %>% kable
```

Coefficients	Estimate	Std. Error	t value	Pr(>|t|)
L	-2.495	1.859	-1.342	0.272
-x*	-83.799	16.779	-4.994	0.015

Other Parameters

```
Stage2_model %>% select(data, model, G) %>%
  mutate(params = map(data, ~tibble(
    `Range: g` = paste0("(", percent(min(.$g)), ', ', percent(max(.$g)), ')' ),
    `Sectors` = nrow(.),
  ))) %>% unnest(params) %>%
  mutate_if(is.numeric, ~round(., 3)) %>%
  mutate( `Adj. R^2` = map_chr(model, ~.$adj.r.squared %>% percent)) %>%
  select(-c(data,model)) %>% gather(stat, value) %>% kable
```

stat	value
G	0.111
Range: g	(10.6%, 11.5%)
Sectors	5
Adj. R^2	85.7%

Table 3

```
Stage3_model %>% filter( Age %in% c(35, 55, 70, 85, 95) ) %>%
  mutate( Age = paste0("x = ", Age) )  %>%
  select(`Sector`, Age, B_Age) %>%
  spread(Age, B_Age) %>%
  mutate_if(is.numeric, ~number(., acc=0.01)) %>%
  kable
```

Sector	x = 35	x = 55	x = 70	x = 85	x = 95
1	37.00	56.18	70.57	84.95	94.54
2	35.19	55.11	70.05	85.00	94.96
3	33.84	54.32	69.67	85.03	95.27
4	33.08	53.87	69.46	85.05	95.44
5	35.89	55.53	70.25	84.98	94.80