Readme File for "Rising skill premium and the dynamics of optimal capital and labor taxation"

This document describes codes and data used in replicating the results of Tsai, Yang, Yu "Rising skill premium and the dynamics of optimal capital and labor taxation" in QE. The codes have been tested in MATLAB R2018b. The repository contains all data and codes to reproduce the model results in the paper.

1. The `Data` folder contains all the data we used to calibrate and solve the model, including (1) PERIC2020.xls collects the data of q_t; (2) McDaniel_tax_update_12_15_14.xlsx collects the labor and capital taxes from McDaniel (2007); (3) Autor.xlsx collects skill premium and skill ratio from Autor (2014); (4) Fortunepartition.xlsx collects wealth distribution between skilled and unskilled.

2. "`main.m`" provides options for reproducing the results of different models in the paper, which calls the following functions

   - "`SS_korv.m`" computes the initial steady state allocation within the model of Krusell et al. (2000) in 1963 given $z_{st} = z_{ut} = 1$.

   - "`calibration.m`" calibrates the parameters within the model of Krusell et al. (2000) in 1963 given $z_{st} = z_{ut} = 1$ and reproduces Table 1 and Table 2 in our paper.

   - "`main_ce_assign.m`" is used to calculate the transitional dynamics of the competitive equilibrium in our extended model, which calls the related functions in the folder of `Assignment`. The file also calibrates the workers productivity parameters $\{a_t, b_t\}$ to match the skill premium and the ratio of skilled to unskilled workers from 1963 to 2012 in the United States. The results are saved in "`CEext.mat`"

   - "`main_Ramsey_benchmark.m`" computes the transitional dynamics of Ramsey taxation in the benchmark model, which calls the related functions in the folder of `Ramsey`. The results are saved in "`Ramsey_benchmark.mat`".

- "`main_Ramsey_ext.m`" computes the transitional dynamics of Ramsey taxation in the extended model, which calls the related functions in the folder of `Ramsey`. The results are saved in "`Ramsey_ext.mat`".

- "`main_Mirrlees_benchmark.m`" computes the transitional dynamics of Mirrleesian taxation in the benchmark model, which calls the related functions in the folder of `Mirrlees`. The results are saved in "`Mirrlees_benchmark.mat`".

- "`main_Mirrlees_ext.m`" computes the transitional dynamics of Mirrleesian taxation in the extended model, which calls the related functions in the folder of `Mirrlees`. The results are saved in "`Mirrlees_ext.mat`".

- "`welfare_compute.m`" computes welfare under different tax schemes and the results are shown in Table 3.

- "`Create_Figure_Data.m`" reproduces time series of price of capital equipment relative to consumption (Figure 1) and tax rates in the U.S.(Figure 9).

- "`Create_FigureR_benchmark.m`" reproduces all figures in Section 4 and Figure 15 in the appendix.

- "`Create_FigureM_benchmark.m`" reproduces all figures in Section 6.

- "`Create_Figure_ext.m`" reproduces all figures in Section 7.

3. The `Utility` folder contains Matlab programs for calculating agent utility and marginal utility functions.

4. The `Production` folder contains Matlab programs for calculating production, factor marginal product, factor price, and skill premium.

5. The `Others` folder contains the Matlab programs we defined to facilitate calculations in `main.m`.

References

Autor, D. H. (2014). Skills, education, and the rise of earnings inequality among the other 99 percent. *Science 344*, 843–851.

Krusell, P., L. E. Ohanian, J.-V. Ríos-Rull, and G. L. Violante (2000). Capital-skill complementarity and inequality: a macroeconomic analysis. *Econometrica 68*(5), 1029–1054.

McDaniel, C. (2007). Average tax rates on consumption, investment, labor and capital in the OECD: 1950-2003. Working Paper.