Comment on "Changing Employment Trends for Older Workers in the OECD"[*]

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1 Introduction

In recent years, various OECD countries have implemented reforms targeting work incentives directed at older workers.[1] So understanding how such reforms affect the labor market is crucial. I see this interesting and important paper by Richard Rogerson and Johanna Walleniusas as a first step in an exciting new research agenda. In this paper, the authors investigate the link between the labor market policy reforms targeting older workers and these workers' employment rates. The paper presents an extremely useful synthesis that brings together findings from different countries, and it suggests an important avenue for further research.

The paper contains numerous insights, and below I discuss the main argument. First, the authors document that the employment rate of men aged 55-64 has displayed a U-shaped pattern over the last four decades. Interestingly (and somewhat surprisingly), this pattern is common across many advanced economies, hinting that a common explanation could be responsible for it. At the same time, the reversal's magnitude varies across countries.

The explanation the authors put forth is based on three steps. First, the authors argue for the importance of "institutions" that gave rise to provisions that favored a reduction in employment rate of this older age group in many countries in the 1970s and 1980s. Second, they suggest there was a mean-reverting aggregate shock which led to a recovery in the employment rate. Third,

[1]See, for example, the discussion in Saporta et al. (2021)

they emphasize the existence of variations in reforms (institutional changes) that prompted an amplified recovery in a subset of countries.

In my discussion I will address two issues. First, I will focus on the U.S. experience. Doing so enables me to concentrate on key covariates that have driven the employment reversal in the U.S. The hope is that the richness of the micro-level U.S. data will deliver findings that will be useful to study in the context of the other countries the authors are interested in. Second, I will present a simple analytical framework that will enable me to identify key forces that shape the employment reversal. I will then discuss how they relate to the authors' hypothesis.

2   The U.S. Experience

In this section I focus on the U.S. experience in terms of the employment rate. The goal is to identify the different covariates which matter for the employment reversal the authors emphasize. I will specifically focus on the role of age, gender, occupation, and education.[2]

2.1   Age

Figure 1 depicts the employment rate of five different age groups.

[FIGURE 1 HERE]

To better understand the relative performance of these age groups, Figure 2 normalizes the employment rate of each group to be equal to 1 in 1994.

[FIGURE 2 HERE]

Indeed, consistent with the main hypothesis of the authors and as Figure 2 shows, the 55-64 age group experiences a dramatically different employment recovery vis-a-vis the other age groups.

2.2   Gender

Figures 1-2 include male and female individuals. However, since the 1960-2000 period saw a pronounced increase in female labor force participation, Figure 3 concentrates on the employment rate of males, while Figure 4 looks at the employment rate of females.

[FIGURE 3 HERE]

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[2]All data is based on a yearly aggregation of the Monthly CPS files from 1976 to 2020.

[FIGURE 4 HERE]

Several conclusions emerge from this analysis. First, even in the U.S. the behavior of the 55-64 male group relative to the other male age groups is distinct. Second, since the turn of the twenty-first century, the female employment rate has plateaued (and has, at times, even begun to fall). However, the only female group that has shown a continued increase in employment rate is exactly the 55-64 age group. Hence, the empirical patterns relating to the 55-64 age group are not solely related to men; even in the U.S., the behavior of the 55-64 female group relative to the other female age groups is distinct.

2.3 Digging into the 55+ age group

If the dynamics of employment are driven by an aggregate shock, then one would expect a relatively continuous response across adjacent age groups. As a result, it is useful both to further separate the 55-64 age group into 55-59 and 60-64 subgroups, and to add the behavior of the 65-69 and 70-74 group. In essence, at first glance, this could help to asses the importance of the "retirement institutions" hypothesis. Figures 5-6 show the employment rates of these different age groups for males and females, respectively.

Two conclusions emerge from this analysis. First, within the 55-64 age group, the differential employment rate dynamics are being mainly dictated by the 60-64 age group. Second, these dynamics seem to be also affecting the 65 and above age group.

[FIGURE 5 HERE]

[FIGURE 6 HERE]

2.4 Occupations

To understand the covariates driving the reversal in the employment rate of the 60-64, I focus in what follows on the role of occupations. Specifically, Figures 7-8 depict the evolution of employment and labor force participation for this age group.[3]

[FIGURE 7 HERE]

[FIGURE 8 HERE]

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[3]In each of these figures the shares of routine occupation (R), non-routine occupation (NRM), non-routine occupations (NRC), and outside of the labor force (NLF) add to 1. In these figures I use NLF as a proxy for the employment rate.

Figures 7-8 reveal that by the time the reversal in NLF for the 60-64 age group takes place, the known decline in routine occupations (see, for example, Autor and Dorn (2013)) has already happened. So, overwhelmingly, the increase in the labor force participation for this age group is due to a rise in employment in non-routine cognitive occupations.[4] Thus, it seems that a key driving force in the U.S. is a "60+ non-routine cognitive occupations-specific shock."

2.5 Education

Given the importance of non-routine cognitive occupations, a natural question to ask is what role education plays in these dynamics. To answer this, Figures 9-10 depict the evolution of the likelihood that a given age group within a certain education level is employed.[5]

[FIGURE 9 HERE]

[FIGURE 10 HERE]

The key insight that emerges from these figures is that we only observe a rise in the employment rate for the members of the 60-64 age group who are in the high education group. This is consistent with the finding regarding the importance of the rise in non-routine cognitive occupations discussed above.[6]

2.6 The Mean Reversal Shock

An additional hypothesis the authors put forth is the presence of a mean reversal aggregate shock. Is there evidence of such a shock? As a proxy for this, Figure 11 depicts the normalized log wages of males. Indeed, consistent with the authors' hypothesis, all wages increased similarly across age groups within specific genders, suggesting an aggregate shock occurred. Yet, as was shown above, the reversal in employment rate did not take place in other age groups.

[FIGURE 11 HERE]

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[4]A word of caution is warranted, as there are known issues of creating time series "occupations" due to the redesign of the occupation definitions.

[5]I divide the data into three education groups: Low (L) which is less than high school, Middle (M) which is high-school graduates and some college, and High (H) which is college and above.

[6]In unreported results I note that there is also a composition effect that is mainly present for males. Specifically, the share within the 60+ who have higher education continued to rise during the period of interest, while in the other age groups that share plateaued. Since individuals with higher education are more likely to work, this change in the composition of education within the 60+ further contributed to the employment dynamics of this age group.

2.7 The Role of U.S. institutions

To summarize, the analysis of the U.S. data suggests that even in the U.S. a reversal in the employment rate of the 55-64 group is observed. The reversal was (i) present within both genders, (ii) mainly driven by the 60 and above age groups, (iii) characterized by a rise in employment in non-routine cognitive occupations, (iv) and only held true for the high education group. These findings seem to suggest that forces affected those close to or above retirement age of very specific demographic groups, resulting in the change in their employment rate.

But what were those institutional reforms in the U.S.? During the period of interest, a reform in the social security system affecting cohorts reaching their 60s during the 1990s and 2000s took place. The changes induced by this reform were varied and numerous: (i) the 1983 amendments that raised the full-retirement-age (FRA) in for birth cohorts 1938 and thereafter until a FRA of 67, reducing lifetime benefits; (ii) increased incentives for delaying entitlement past the FRA (the so called "delayed retirement credit"); and (iii) an elimination of the social security "earnings test" in 2000.[7] Indeed, a vast literature argues that these reforms can account for a significant fraction of the employment dynamics of the the older age groups in the U.S.[8] So, consistent with the authors' view regarding the overall importance of institutional changes, the U.S. experience seems to highlight the role of retirement institutions in shaping the employment dynamics of those near retirement.

3   A Model

In this section, I present a simple model that is useful in "identifying" the different channels and parameters that capture the mechanisms the authors are seeking. My goal with this framework is to (i) clarify what the "changes in institutions" the authors highlight mean within a structural context, and (ii) emphasize that the primary elasticities that affect the employment reversal are "context"-specific. Given the nature of this comment, the model makes several simplifying assumptions that enable me to get some closed-form solutions and to perform a simple quantification exercise.

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[7]According to the earning test, benefits of workers aged 65-69 were reduced if earnings were above a threshold.
[8]See e.g. Friedberg (2000), Mastrobuoni (2009), Blau and Goldstein (2010), Banerjee and Blau (2013), Blau and Goodstein (201), Gellber et al. (2016), Duggan et al. (2019) and especially Borsch-Supan and Courtney Coile (2020).

3.1 The Structure of the Model

Consider an individual who decides whether to retire or work for an additional period. I assume individuals differ in their ability, which is denoted by ϵ and is drawn from a distribution with a cumulative density function (CDF) $\Gamma(\epsilon)$. Individuals who work are taxed at a constant labor tax and experience a working disutility.[9] Individuals who retire receive benefits that can be indexed to their market wage, and they face a tax rate based on this benefit income. The nature of the model leads to a cutoff rule in ability that determines the employment rate. Formally, the value of working one more period is given by

$$V_E(\epsilon) = U(\underbrace{\epsilon}_{\text{Ability}} \times \underbrace{\omega}_{\text{Efficiency Wage}} \times (1 - \underbrace{\tau_\omega}_{\text{Labor Tax Rate}}) - \underbrace{G}_{\text{Working Disutility}}) + \beta V'_N, \tag{1}$$

where the value of retiring is given by

$$V_N = U(\underbrace{b(\epsilon)}_{\text{Benefits: can be indexed to the wage}} \times (1 - \underbrace{\tau_b}_{\text{Benefits Tax Rate}})) + \beta V'_N \tag{2}$$

where V'_N denotes the continuation value.[10] This formulation leads to an implicit cutoff participation rule in ability:

$$b(\epsilon^*) \times (1 - \tau_b) = \epsilon^* \times \omega \times (1 - \tau_\omega) - G, \tag{3}$$

implying that the employment rate is given by

$$\underbrace{E}_{\text{Employment Rate}} = (1 - \underbrace{\Gamma(\epsilon^*)}_{\text{CDF}}), \tag{4}$$

which is depicted in Figure 12 .

[FIGURE 12 HERE]

Figure 12 also shows what are, within the model, the "changes in institutions" that could lead to a change in the cutoff value and, in turn, the employment rate; these could be changes in the degree of benefits, or changes in either of the two tax rates.

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[9] In order to derive clear predictions, I assume a no-wealth effect utility function; I include the working disutility as an argument within the utility function.

[10] It is important to emphasize that in this formulation I made the simplifying assumption that the continuation value V'_N is identical whether or not the individual decides to work an additional period. That is, I assume there is no increase in assets or benefits as a result of the decision to work an additional period. This assumption enables me to derive the closed form solution for the cutoff value ϵ^*. I am grateful to Gadi Barlevy for raising this issue.

But identical changes in the institutions do not map to the same changes in the employment rate, which is the authors' object of interest. Specifically, let a circumflex denote a variable's percentage change from its original value. Then, with a bit of tedious algebra we can show that the percentage change in the employment rate is given by

$$\widehat{E} = \left(\frac{\Gamma'(\epsilon^*)}{E^*} \epsilon^* \right) \times \underbrace{\left(\begin{array}{cc} \frac{\widehat{\omega}}{\left[1 - \frac{b(1-\tau_b)}{\omega(1-\tau_\omega)}\right]} & -\frac{\widehat{\tau_\omega}}{\left[\frac{(1-\tau_\omega)}{\tau_\omega} - \frac{b}{\omega}(1-\tau_b)\right]} \\ -\frac{\widehat{b}}{\left[\frac{\omega(1-\tau_\omega)}{b(1-\tau_b)} - 1\right]} & +\frac{\widehat{\tau_b}}{\left[\frac{\omega(1-\tau_\omega)}{b\tau_b} - \frac{(1-\tau_b)}{\tau_b}\right]} \end{array} \right)}_{\widehat{\epsilon^*}}, \tag{5}$$

for the case where the retirement benefits are indexed to the wage, and by

$$\widehat{E} = \left(\frac{\Gamma'(\epsilon^*)}{E^*} \epsilon^* \right) \times \underbrace{\left(\widehat{\omega} - \frac{\tau_\omega}{(1-\tau_\omega)} \widehat{\tau_\omega} + \frac{b\tau_b\widehat{\tau_b} - b(1-\tau_b)\widehat{b}}{[\omega(1-\tau_\omega)]\epsilon^*} \right)}_{\widehat{\epsilon^*}} \tag{6}$$

for the case where the benefits are constant.

These expressions make the simple point that the change in the employment rate (i.e. $\widehat{E}$), is not simply given by the change in the "institution variables" (the other ⌢ variables). Rather, the elasticity has two components that affect the mapping from the institutional changes to the employment rate. First, the elasticity is, in fact, institution context-dependent; the values of the two tax rates and the benefits dictate the mapping. Second, the ability distribution itself (or rather the elasticity of the ability distribution around the original employment rate) is also an object that affects that same elasticity. Figure 13 visually illustrates the basic point that, even for the same change in the cutoff value, the ability distribution's shape matters for the authors' object of interest, i.e. $\widehat{E}$.

[FIGURE 13 HERE]

3.2 A Simple Quantification

Equations 5- 6 suggest that in order to quantify the impact of the reforms within the context of the model, we would need to gauge the value of the different components that shape the elasticities. The obvious challenge is that, for many countries, the empirical estimates of such elasticities do not exist.

Accordingly, an alternative is to rely on the more commonly estimated (across countries) elas-

ticities with respect to the wage. As I show below, such an elasticity can be used to recover the different components that determine the reform elasticities. Specifically, the elasticity of the employment rate with respect to the wage is given by

$$
\widehat{E} = \begin{cases} \left(\frac{\Gamma'(\epsilon^*)}{E^*}\epsilon^*\right) \times \frac{\widehat{\omega}}{\left[1-\frac{b(1-\tau_b)}{\omega(1-\tau_\omega)}\right]} & \begin{array}{l}\text{Benefits indexed}\\\text{to wages/ability}\end{array} \\[3em] \left(\frac{\Gamma'(\epsilon^*)}{E^*}\epsilon^*\right) \times \widehat{\omega} & \begin{array}{l}\text{Benefits}\\\text{constant}\end{array} \end{cases}
\tag{7}
$$

If an estimate of such an elasticity exists, then we can recover all the necessary components that dictate the value of the reform elasticities. To do so, it's first useful to note that the above equation suggests there are three components that determine the elasticity of the employment rate with respect to the wage: The first term is the net pension replacement rate: $\left[1 - \frac{b(1-\tau_b)}{\omega(1-\tau_\omega)}\right]$.[11] The second one is the ability distribution $\Gamma'(\epsilon^*)$. And the third one is the employment rate E^*.

Net Pension Replacement Rate The net pension replacement rate can be read from existing estimates.[12] As an example, Figure 14 depicts the net pension rates for four countries of interest.

[FIGURE 14 HERE]

Ability Distribution We need to make a parametric distribution assumption with respect to the ability distribution. Accordingly, I follow the common practice in the literature and assume that ability is distributed log-normal. In order to identify the mean, the variance, and the cutoff value of this distribution, I proceed with the following algorithm. I guess values for these three parameters and iteratively check whether they satisfy the following three moments. First, they need to satisfy the targeted employment rate prior to the reform, E^*. Second, in the model the after-tax wages must be proportional to ability, i.e. equal to $\underbrace{\epsilon}_{\text{Ability}} \times \underbrace{\omega}_{\text{Efficiency Wage}} \times (1 - \underbrace{\tau_\omega}_{\text{Labor Tax Rate}})$, and thus it can be mapped to the the observed (truncated) variance of wages for the group of interest in the data. Third, the elasticity of employment with respect to the wage is a moment that is routinely estimated in the empirical literature, so I require its value in the model, i.e. $\left(\frac{\Gamma'(log(\epsilon^*))}{E^*}\epsilon^*\right) \times \frac{1}{\left[1-\frac{b(1-\tau_b)}{\omega(1-\tau_\omega)}\right]}$ to match the country-specific value.

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[11]I opt to show the approach for the case where the benefits are indexed to the wage since this includes an extra term of the net pension replacement rates, but naturally, the approach discussed above can easily be implemented for the second case as well.

[12]See the OECD "pensions at a glance" project.

As an example of how I implement this approach, I consider the cases of the U.S. and Israel. My group of interest includes males, aged 55-64, with education above high school for the year 2012.[13] Table 1 reports the net pension replacement rate, the employment rate, and standard deviation of log wages,[14], and indicates the elasticity of employment with respect to wages.[15].

[Table 1 here]

Armed with these values, I can implement the approach discussed above and recover the standard deviation and mean of the ability distribution. Then, given values for the tax rate,[16] I can go back to Equation 5 and recover all the different reform elasticities, as now we have the implied values for all the components. Table 2 reports the estimated elasticities of the three reforms within the model.

[Table 2 here]

4 Conclusions

This important paper by Richard Rogerson and Johanna Walleniusas addresses the impact of different reforms on the labor market. As a first step, the authors chose to consider many countries in order to paint a general picture that points to the main insights that emerge from this study.

In the first part of my comment, my goal was to consider the U.S. case, which enabled me to identify the key covariates shaping the employment reversal. Whether these are the same covariates that dictated the dynamics in other countries is yet to be determined, but the U.S. experience suggests this is, at the very least, an important exercise to conduct on a country-by-country basis. Moreover, my reading of the U.S. data is that the authors' institutional change hypothesis is, indeed, borne out in the U.S.

In the second part of this comment, I presented a simple model whose goal was to highlight precisely what institutions are (at least in the eyes of the model). Moreover, the model underscored the importance of distinguishing between "institutional changes" and elasticities which jointly determine the evolution of the employment rate. Finally, I suggested a way to identify the key

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[13]The choice of this specific group was guided by the availability of data for the two countries.

[14]For the U.S. I calculate these two measures from the CPS, while for Israel I am grateful to Itay Saporta for providing me with the values.

[15]For the U.S. the estimate is taken from Saporta et al. (2021), while for Israel the estimate is taken from Chetty et al. (2013).

[16]footnoteI set $\tau_\omega = 0.3$ and $\tau_b = 0.15$ for the U.S. and $\tau_\omega = 0.5$ and $\tau_b = 0.2$ for Israel.

parameters that control the "elasticity reforms," a valuable undertaking when considering reforms for which there are no existing elasticity estimates.

I look forward to future work that quantifies the role of institutions in the employment reversal, as surely this is of first-order importance given demographic transitions.

Figures
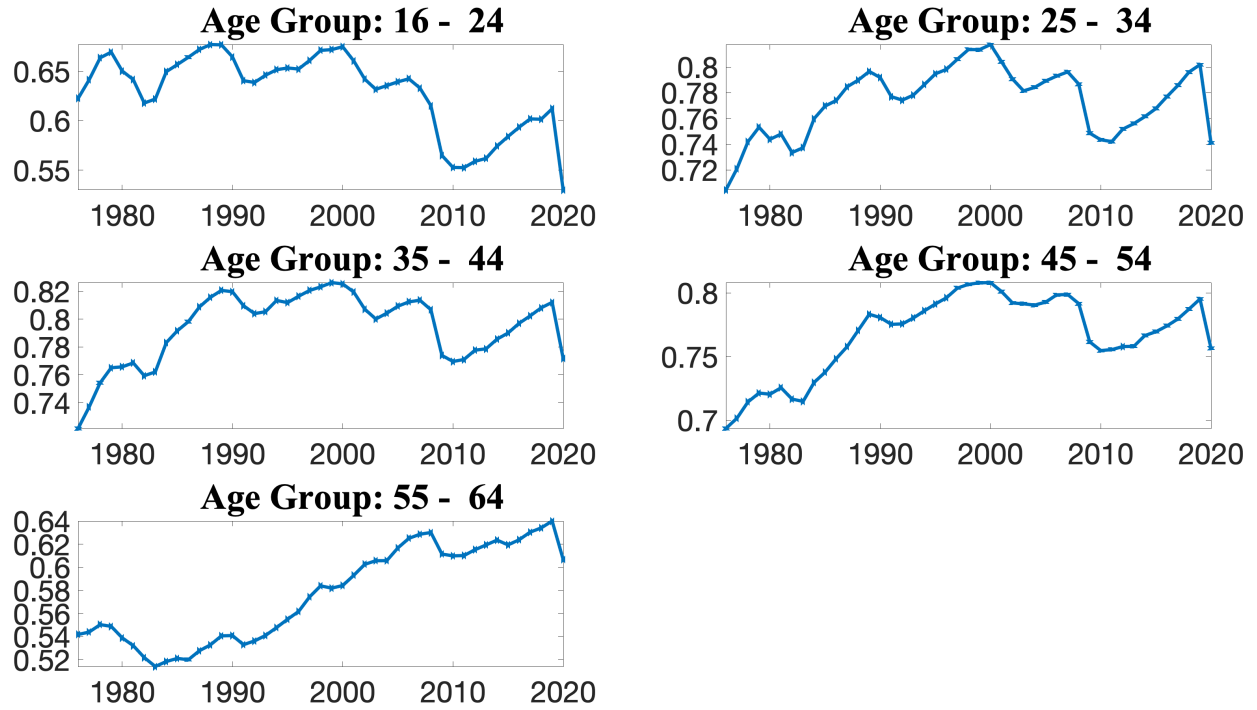
Figure 1: Employment Rate by Age Groups

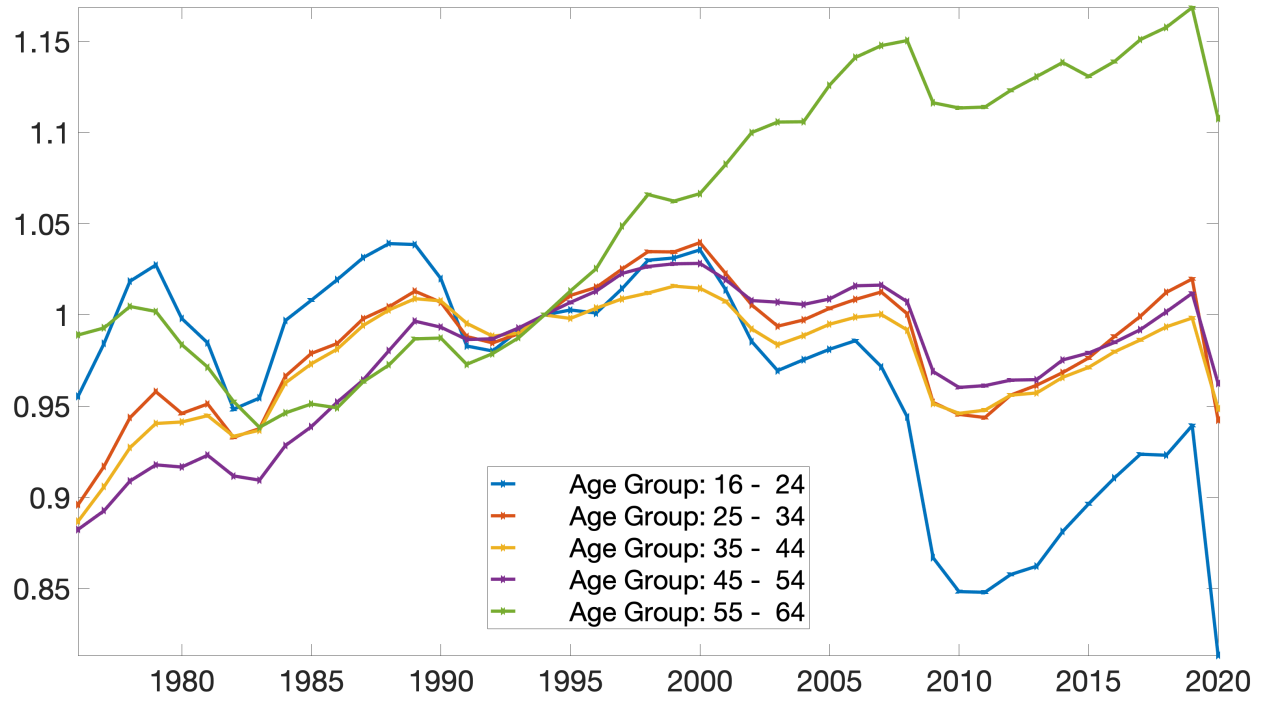Figure 2: Normalized Employment Rate by Age Groups
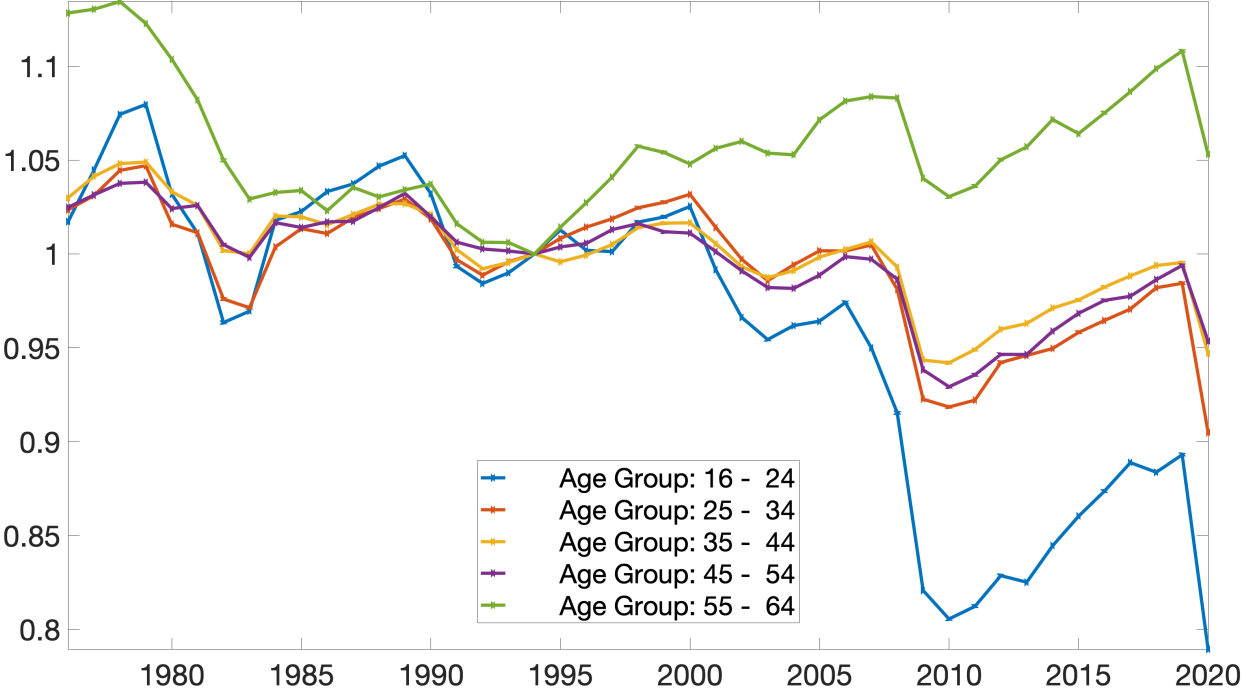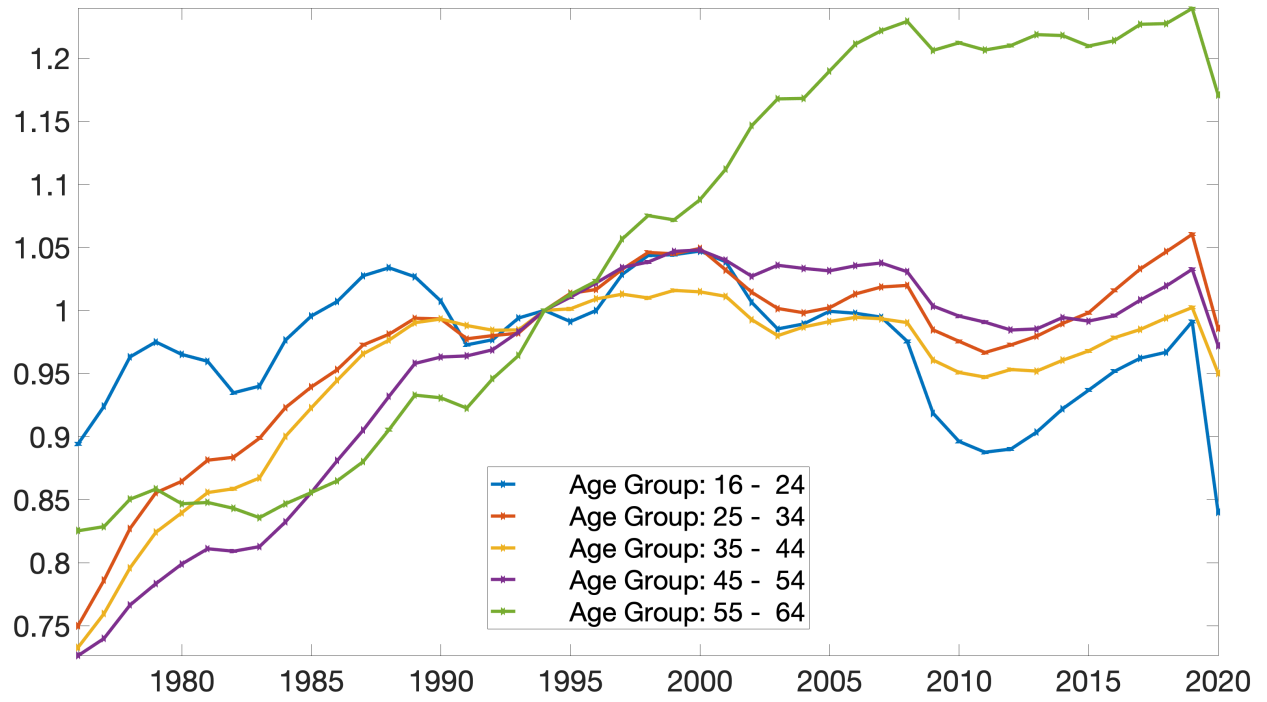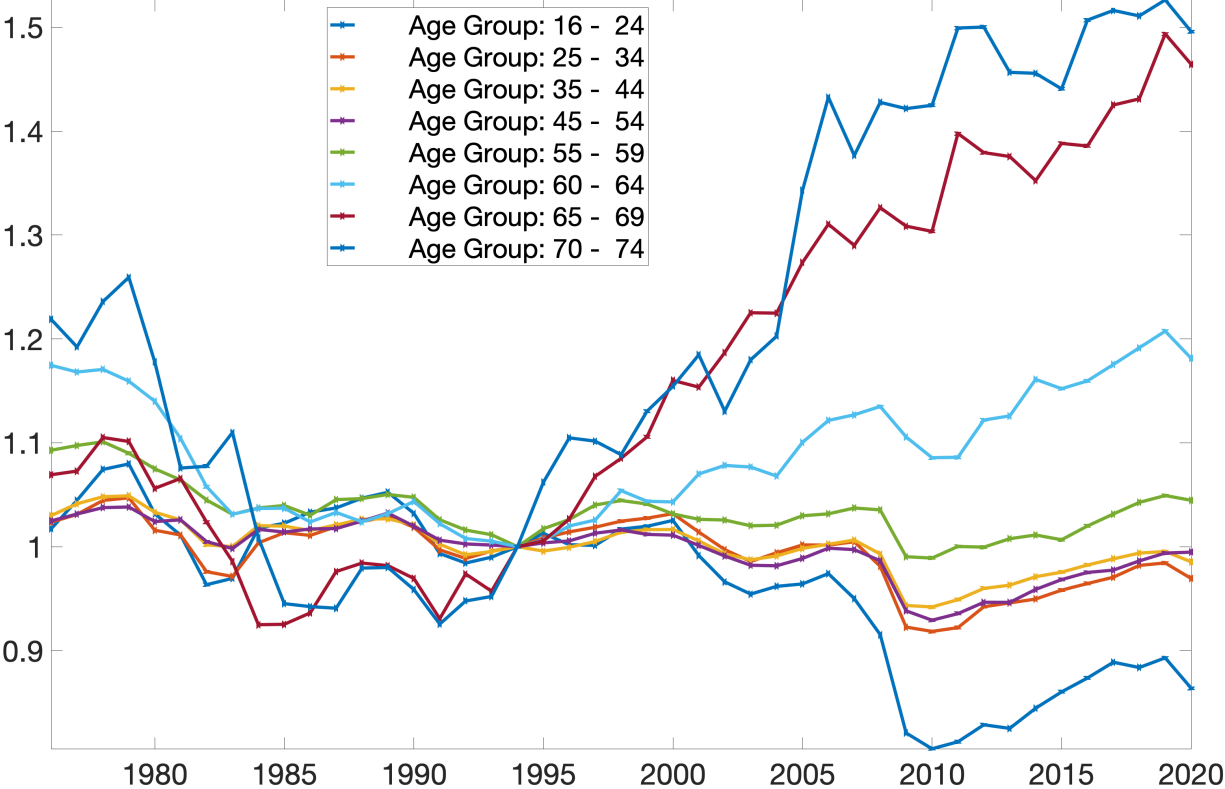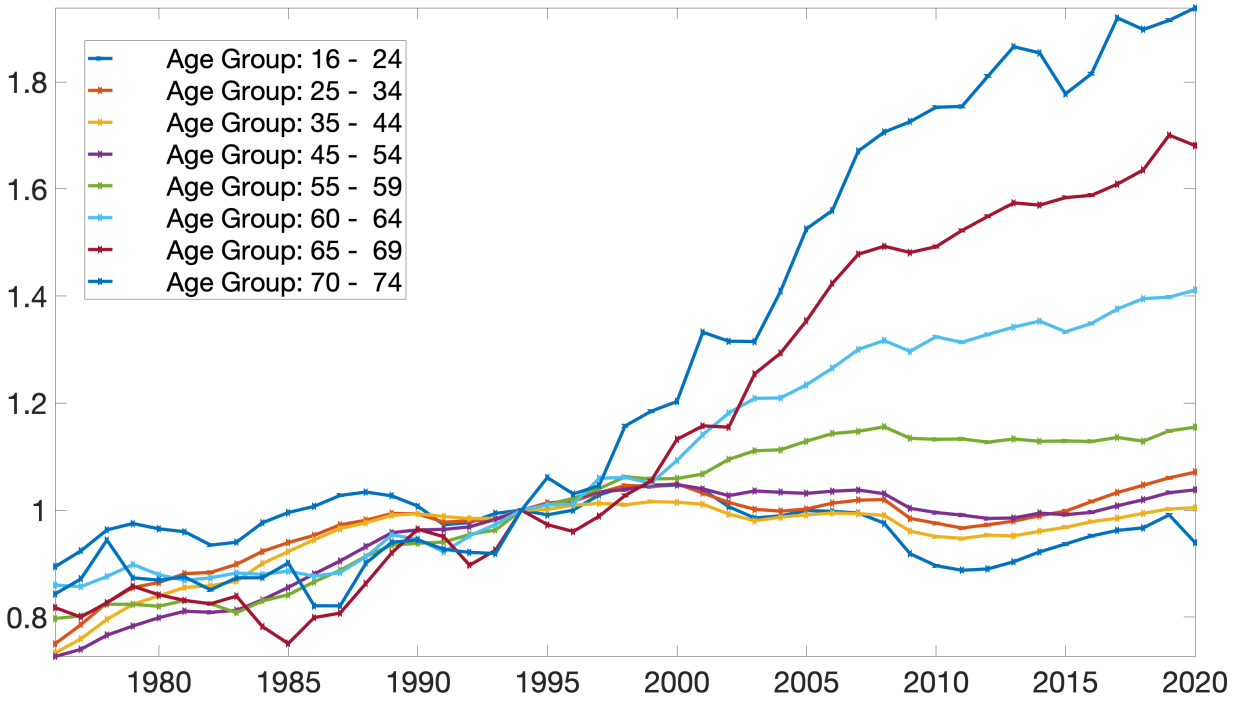
Figure 3: Normalized Employment Rate by Age Groups: Male

Figure 4: Normalized Employment Rate by Age Groups: Female

Figure 5: Normalized Employment Rate by Age Groups: Male

Figure 6: Normalized Employment Rate by Age Groups: Female

Figure 7: Labor Force Participation and Occupation 60-64: Male
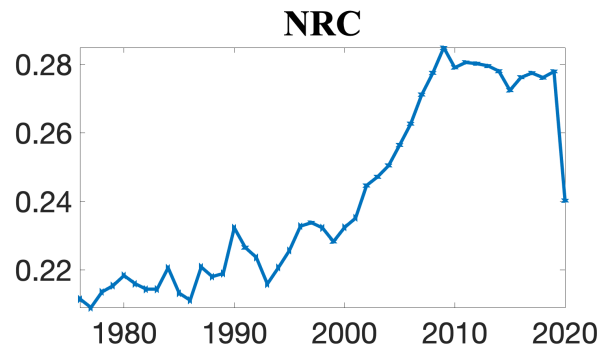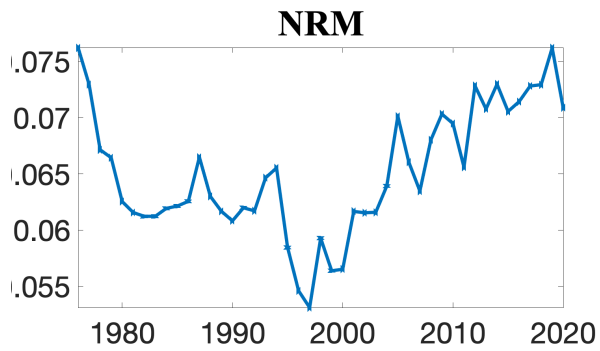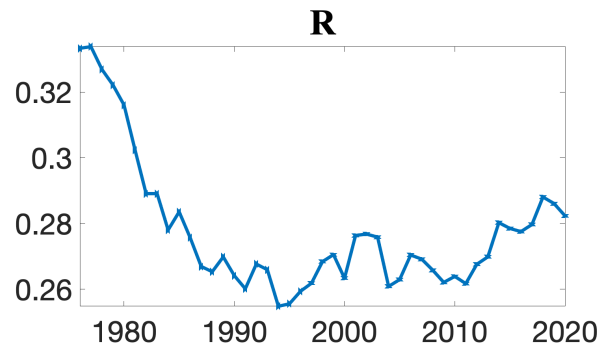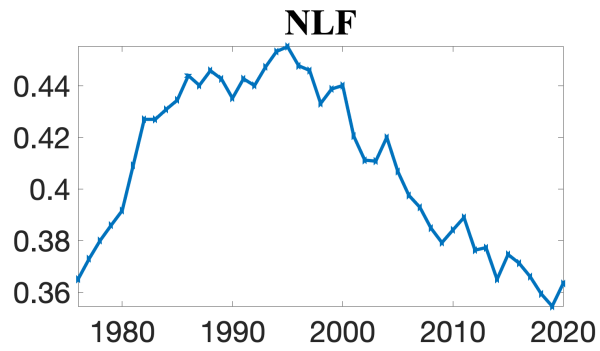
Figure 8: Labor Force Participation and Occupation 60-64: Female
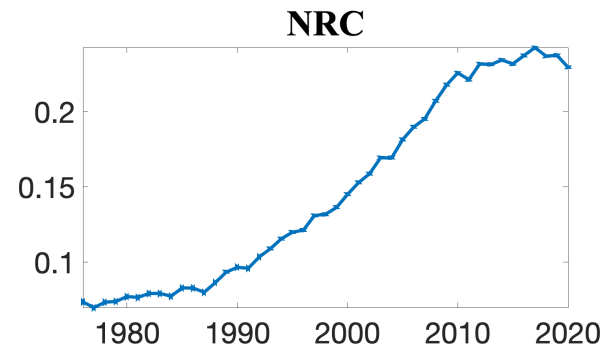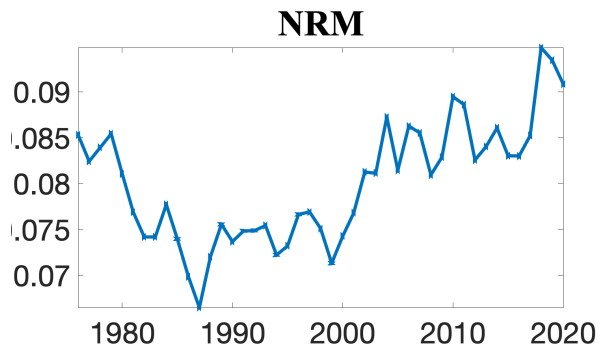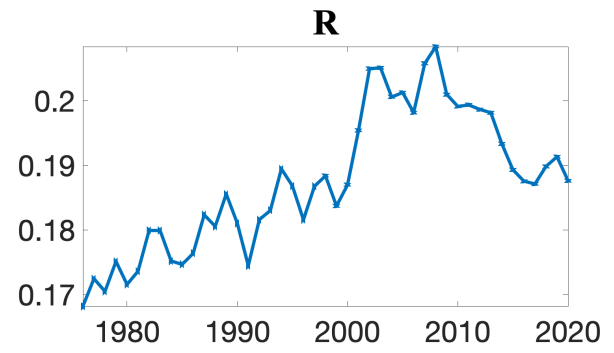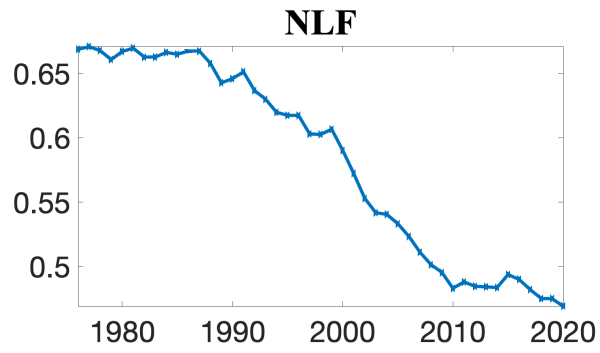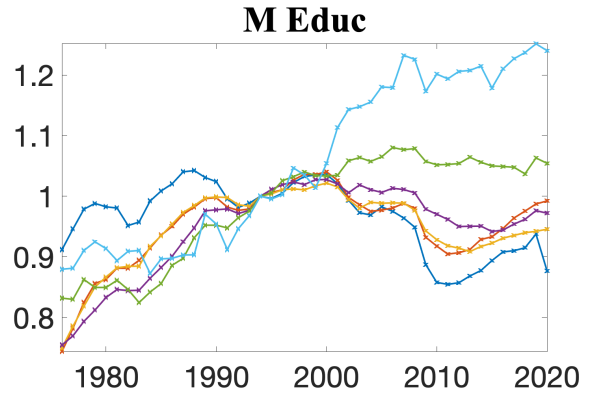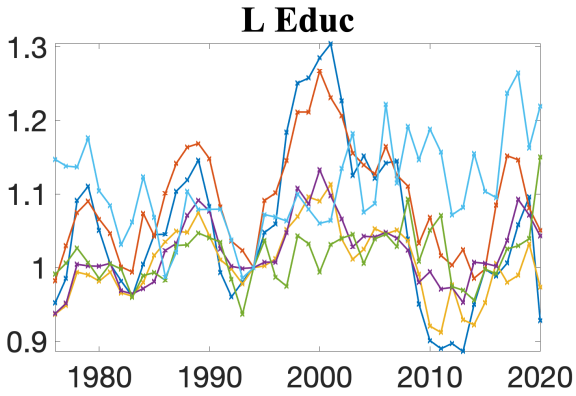
Figure 9: Education and Age Group: Propensity for Males
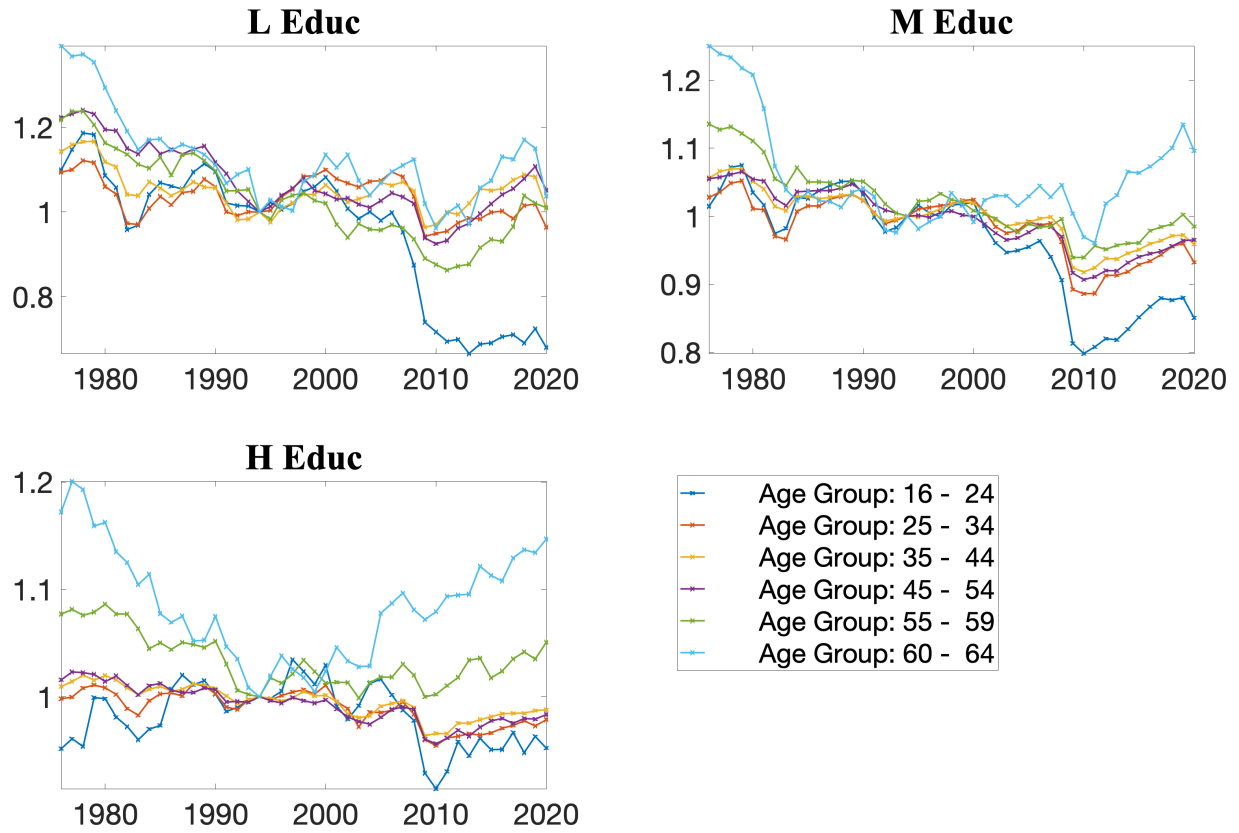
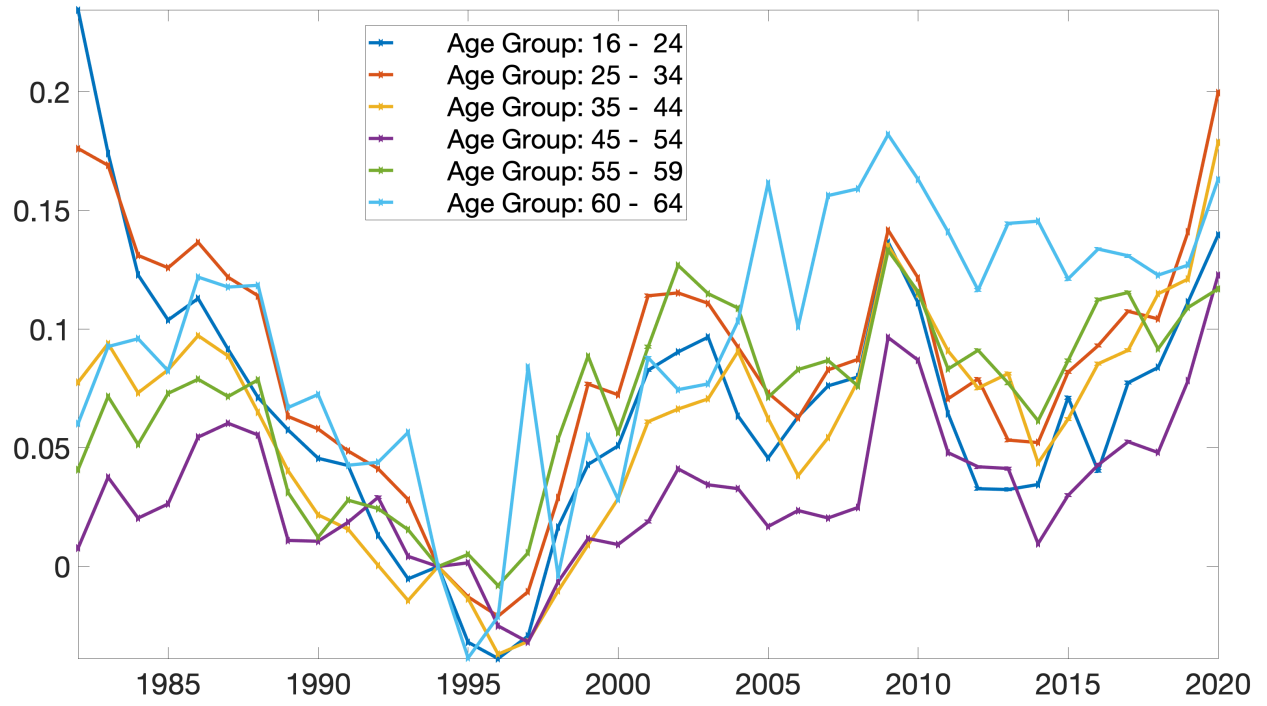Figure 10: Education and Age Group: Propensity for Females
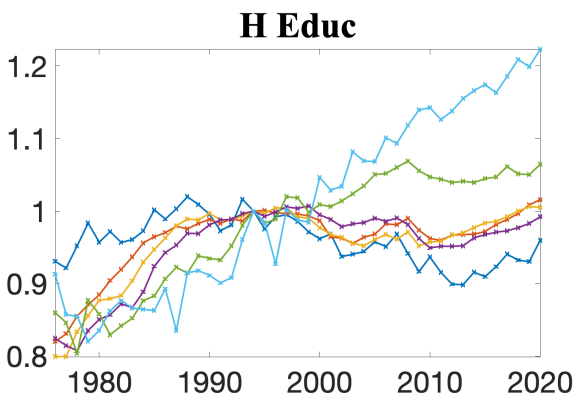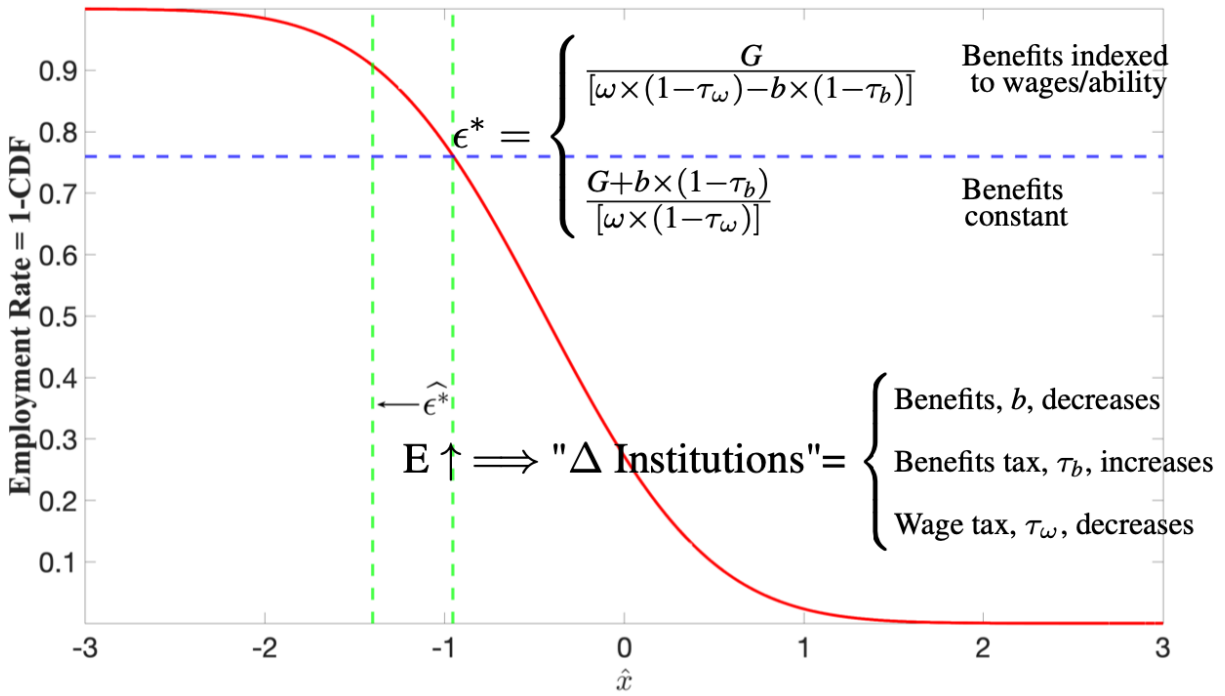
Figure 11: Nomalized Log wages: Male

Figure 12: Employment Rate and Institutions

*Notes*: The red line depicts the $1 - CDF$ values (I use the estimated values of the mean and variance of the distribution I later estimate for the U.S.). The specific cutoff value ϵ^* depends on whether the benefits are indexed to the wages or whether they are constant.

Figure 13: Employment Rate and Ability
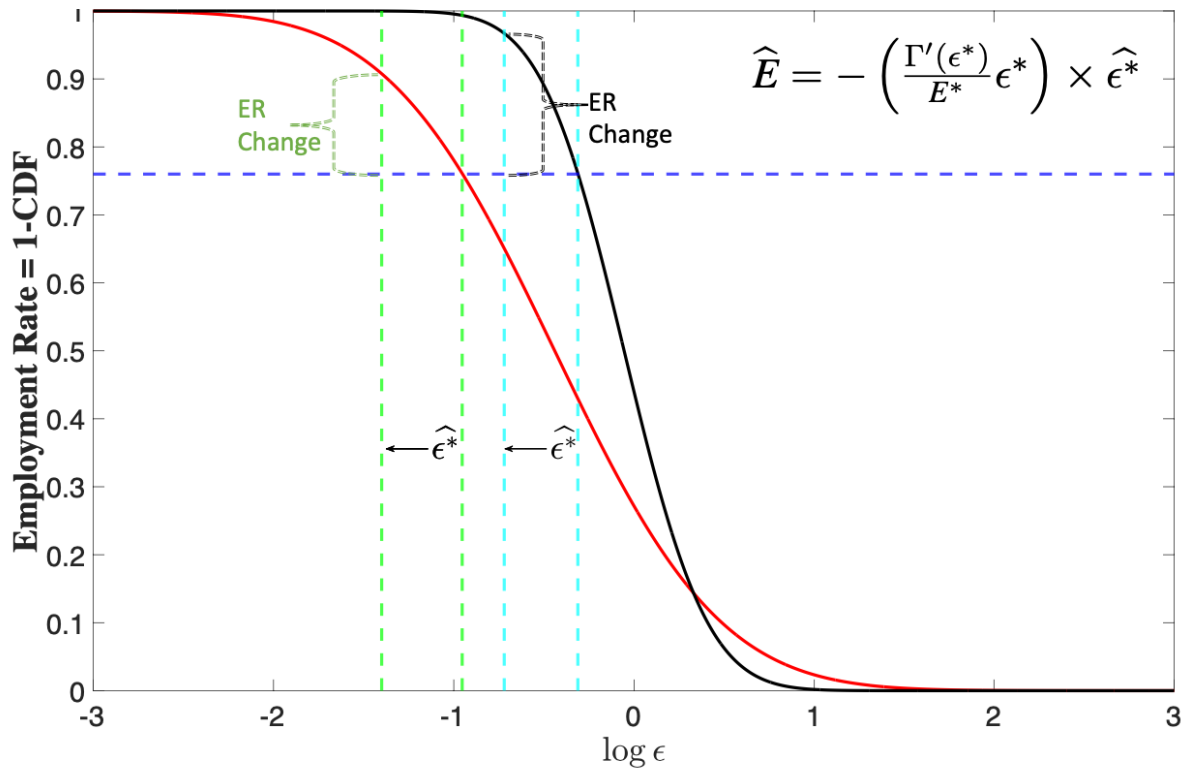
Notes: The red and black lines depict two different distributions (i.e. two different values of $1 - CDF$).

Figure 14: Net Pension Replacement Rates

Net pension replacement rates: Men(2018)
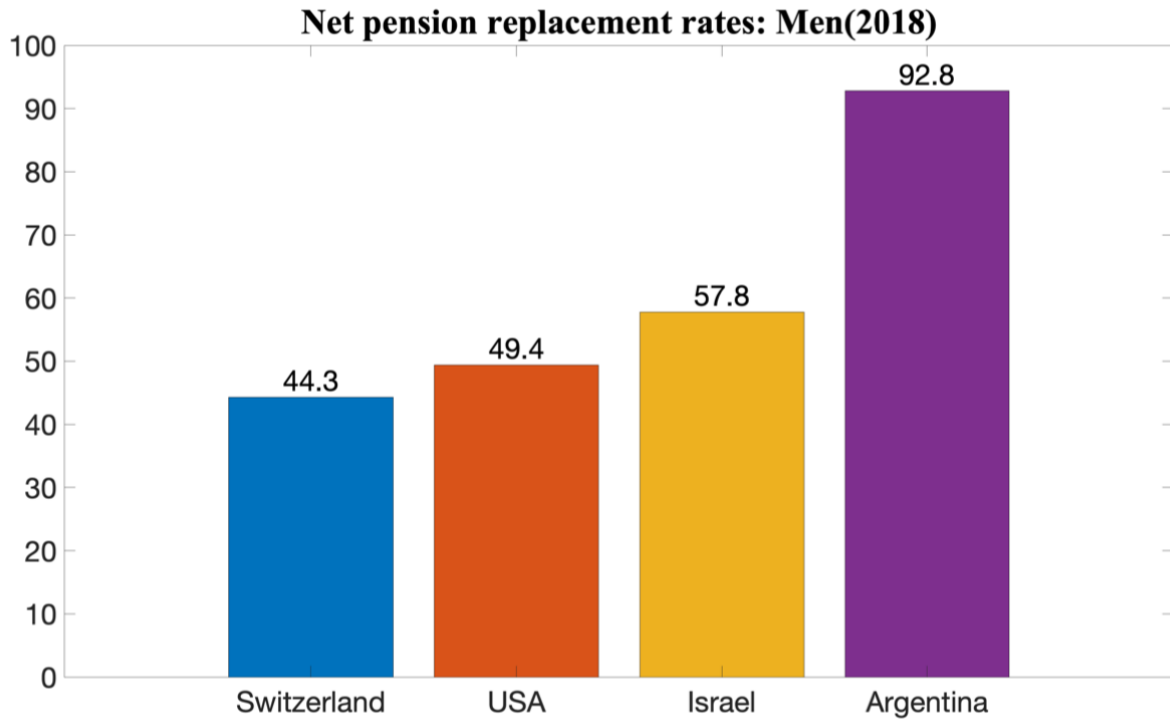
Notes: The   data   is   taken   from   the   OECD   "pension   at   a   glance"   project;   see
https://data.oecd.org/pension/net-pension-replacement-rates.htm

Tables

Table 1: Estimates

	Israel	USA
NPR:	0.578	0.494
Emp Rate:	0.83	0.76
Std W:	0.61	0.72
Elasticity:	0.43	[.13-0.43]
"Identified" Parameters:		
Std Ability:	1.0	1.15
Mean Ability:	0.48	0.33
ϵ^*:	0.60	0.61

Notes: For the exercise reported in this comment, I took the upper bound of the elasticity in the U.S. since it coincided with the values reported in Israel.

Table 2: Reform Elasticity Estimates

Elasticity	US	Israel
$\eta_{\widehat{E},\widehat{b}}$	-0.21	-0.25
$\eta_{\widehat{E},\widehat{\tau_\omega}}$	-0.11	-0.26
$\eta_{\widehat{E},\widehat{\tau_b}}$	0.038	0.062

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