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Abstract

We explore how labor union affects the wealth-income ratio in an innovation-driven growth model and find that it depends on the union's objective. If the union is employment-oriented (wage-oriented), then a decrease in its bargaining power would have a positive (an ambiguous) effect on the wealth-income ratio. Calibrating the model to data, we find that a decrease in union bargaining power causes a sizable increase in the wealth-income ratio, which explains at least one-third of the increase in the US wealth-income ratio.

JEL classification: D31, J50, O30, O43
Keywords: wealth-income ratio; labor union; economic growth

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1 Introduction

The following stylized facts in the US are well documented. First, union membership density has declined; see Figure 1.[1] Second, labor income share has declined; see Figure 2.[2] Third, the wealth-income ratio has increased; see Figure 3.[3] This study uses an innovation-driven growth model with labor union to explore how declining union bargaining power (reflecting declining union membership in the data) affects the wealth-income ratio. We find that declining union power decreases labor income share and increases the wealth-income ratio. This finding is consistent with the above stylized facts and also with the negative relationship in Figure 4 between union membership density and the wealth-income ratio across OECD countries.[4]

The above results can be explained as follows. A decrease in union bargaining power reduces labor income and increases profit income,[5] which in turn increases the value of firms. This is a positive effect on the wealth-income ratio. However, union bargaining power also has a general-equilibrium effect on the wealth-income ratio through employment and economic growth. The sign of this effect depends on the union's objective. If the union is employment-oriented, then a decline in its bargaining power would lower employment, which reduces the level of R&D and the rate of variety expansion (i.e., the rate at which a firm loses its market share). This in turn increases the value of monopolistic firms and the wealth-income ratio. However, if the union is wage-oriented, then the opposite effects prevail. In this case, the overall effect of a decline in union bargaining power on the wealth-income ratio is ambiguous and would be positive if the household's discount rate is below a threshold. Calibrating our model to the data, we find that a decrease in union bargaining power leads to a sizable increase in the wealth-income ratio, which explains at least one-third of the increase in the US wealth-income ratio.

Empirical studies often find that de-unionization and weaker unions worsen income inequality.[6] Piketty (2014) shows that wealth inequality is an important cause of income inequality and the wealth-income ratio has increased significantly in the US. Thus, this study uses a growth-theoretic framework to explore how union bargaining power affects the wealth-income ratio. Also, we calibrate the model to data to see how large an effect it can have quantitatively.

This study also relates to the literature on innovation and growth. The seminal study by Romer (1990) and many subsequent studies assume a neoclassical labor market. Some studies however explore the effects of labor union on innovation. Palokangas (1996) is an early study and finds that increasing union bargaining power stimulates growth. In contrast, Boone (2000) finds that union hurts growth, whereas Ji *et al.* (2016) find that union has both negative and positive growth effects that cancel each other leaving an overall neutral effect. As in Chu *et al.* (2016), we find that union bargaining power can have a positive, neutral or negative effect on employment and growth depending on the union's objective. This result is similar to Chang *et al.* (2007), who consider an AK growth model. Our study differs from Chang *et al.* (2007) by considering an R&D-based growth model. More importantly, the current study differs from all the above studies by exploring how union affects the wealth-income ratio, in addition to

[1] Data source: OECD Statistics.

[2] Data source: US Bureau of Labor Statistics.

[3] Data source: World Wealth and Income Database.

[4] We include high-income OECD countries with available data and show the average between 1960 and 2014.

[5] De Loecker and Eeckhout (2017) indeed find that the profit rate in the US has increased since 1980.

[6] See for example Jaumotte and Buitron (2015) and Herzer (2016) for recent studies and Manzo and Bruno (2014) for a survey of earlier studies in the literature.

employment and growth which have general-equilibrium effects on the wealth-income ratio.

2 The model

We modify the R&D-based growth model from Romer (1990) by considering an economy-wide labor union that bargains with an economy-wide federation representing employers to determine wage and employment, which affects innovation. The modelling of the union is based on Chang *et al.* (2007). Our model is a closed-economy version of the open-economy model in Chu *et al.* (2016).

2.1 Household

The representative household has the following utility function:

$$U = \int_0^\infty e^{-\rho t} \ln c_t dt. \tag{1}$$

c_t denotes consumption of final good at time t. $\rho > 0$ is the discount rate. The household maximizes utility subject to

$$\dot{a}_t = r_t a_t + w_t l_t + b_t (L - l_t) - \tau_t - c_t. \tag{2}$$

a_t denotes financial assets (i.e., the equity shares of firms). r_t is the real interest rate. w_t is the wage rate. L is the inelastic supply of labor. l_t is employment. Therefore, $L - l_t$ is unemployment, and the unemployment rate is $u_t \equiv 1 - l_t/L$. b_t is unemployment benefit. τ_t is a lump-sum tax. Standard dynamic optimization yields the following Euler equation:

$$\frac{\dot{c}_t}{c_t} = r_t - \rho. \tag{3}$$

2.2 Final good

A unit continuum of firms produce final good y_t. The production function is

$$y_t = (l_t)^\alpha \int_0^{N_t} [x_t(i)]^\beta di, \tag{4}$$

where $\alpha, \beta \in (0, 1)$ and $\alpha + \beta < 1$. l_t is the employment of labor. $x_t(i)$ is differentiated input $i \in [0, N_t]$. Following Chang *et al.* (2007), we assume decreasing returns to scale to allow firms to earn positive profit,[7] which is necessary to facilitate bargaining between the employers' federation and the labor union. The profit function of the representative firm is

$$\Pi_t = y_t - w_t l_t - \int_0^{N_t} p_t(i) x_t(i) di, \tag{5}$$

[7] This can be justified by the presence of a fixed factor input owned by the firms.

where $p_t(i)$ is the price of $x_t(i)$. The firm chooses $x_t(i)$ to maximize Π_t. The conditional demand function for $x_t(i)$ is

$$p_t(i) = \beta(l_t)^{\alpha}[x_t(i)]^{\beta-1}. \tag{6}$$

Here we depart from the usual treatment and follow previous studies to assume that an economy-wide union bargains with an economy-wide federation representing employers to determine wage w_t and employment l_t. For simplicity, we consider a *closed-shop* union under which only union members are eligible for employment. Following Pemberton (1988) and Chang *et al.* (2007), we consider a managerial union whose objective is jointly determined by the union leaders' desire for a larger membership and the members' desire for a higher wage. Formally, we specify a Stone-Geary objective function:[8]

$$O_t = (w_t - b_t)^{\omega} l_t, \tag{7}$$

where $\omega > 0$ measures the weight that the union places on workers' wage income net of unemployment benefit. $\omega > 1$ ($\omega < 1$) implies that the union is wage-oriented (employment-oriented).

The employers' federation and the labor union bargain over w_t and l_t. The generalized Nash bargaining function is

$$\max_{w_t, l_t} B_t = (O_t)^{\theta}(\Pi_t)^{1-\theta}. \tag{8}$$

The parameter $\theta \in (0, 1)$ measures the bargaining power of the union relative to the employers. The bargaining solutions are

$$\frac{\partial B_t}{\partial w_t} = 0 \Leftrightarrow \frac{(w_t - b_t)l_t}{\Pi_t} = \frac{\omega\theta}{1-\theta}, \tag{9}$$

$$\frac{\partial B_t}{\partial l_t} = 0 \Leftrightarrow \frac{w_t l_t - \alpha y_t}{\Pi_t} = \frac{\theta}{1-\theta}. \tag{10}$$

2.3 Differentiated intermediate inputs

A continuum of industries produce intermediate inputs $i \in [0, N_t]$. A monopolist owns a patent on the technology of differentiated input i. For simplicity, we follow Acemoglu (2002) to assume an one-to-one technology that uses final good to produce intermediate input. The profit function of monopolist i is

$$\pi_t(i) = p_t(i)x_t(i) - x_t(i) = \beta(l_t)^{\alpha}[x_t(i)]^{\beta} - x_t(i). \tag{11}$$

Differentiating (11) with respect to $x_t(i)$ yields the familiar profit-maximizing price given by $p_t(i) = 1/\beta$. To allow for a more realistic quantitative analysis, we introduce an additional markup parameter $\eta \in (1, 1/\beta)$, which may capture patent breadth as in Goh and Olivier (2002) or price regulation as in Evans *et al.* (2003). In this case, $p_t(i) = \eta$. The demand and profit functions are

$$x_t(i) = \left[\frac{\beta(l_t)^{\alpha}}{\eta}\right]^{1/(1-\beta)} \equiv x_t, \tag{12}$$

$$\pi_t(i) = (\eta - 1)\, x_t(i) = (\eta - 1)\left[\frac{\beta(l_t)^{\alpha}}{\eta}\right]^{1/(1-\beta)} \equiv \pi_t. \tag{13}$$

[8] Alternatively, one can consider $O_t = (w_t - b_t)^{\omega}(l_t)^{\lambda}$. We normalize $\lambda = 1$ for simplicity.

2.4 R&D

Following Rivera-Batiz and Romer (1991), we specify a lab-equipment R&D process. Inventing a new variety of differentiated inputs requires μ units of final good. The innovation function is

$$\dot{N}_t = R_t/\mu, \tag{14}$$

where R_t is final good devoted to R&D. Let's denote v_t as an invention value. Free entry in R&D implies

$$(v_t - \mu)\dot{N}_t = 0. \tag{15}$$

The no-arbitrage condition is

$$r_t = \frac{\pi_t + \dot{v}_t}{v_t}, \tag{16}$$

which equates the interest rate to the asset return per unit of asset, given by the monopolistic profit π_t plus any potential capital gain $\dot{v}_t$.

2.5 Government

The government provides unemployment benefit and finances it by a lump-sum tax. The balanced-budget condition is

$$\tau_t = b_t\left(L - l_t\right). \tag{17}$$

To ensure balanced growth, we assume unemployment benefit b_t to be proportional to output y_t; i.e., $b_t = \bar{b}y_t$, where $\bar{b} > 0$ is a policy parameter.

2.6 Decentralized equilibrium

An equilibrium is a time path of allocations $\{c_t, y_t, x_t(i), l_t, R_t\}$, prices $\{r_t, w_t, p_t(i), v_t\}$ and fiscal policies $\{\tau_t, b_t\}$ such that the following conditions hold at each instance of time:

- the household chooses $\{c_t\}$ to maximize utility taking $\{r_t, w_t, b_t, \tau_t\}$ as given;
- final-good firms produce $\{y_t\}$ to maximize profit taking prices $\{p_t(i)\}$ as given;
- an economy-wide federation representing final-good firms bargains with an economy-wide union to determine $\{w_t, l_t\}$;
- monopolistic firms produce intermediate inputs $\{x_t(i)\}$ and set $\{p_t(i)\}$ to maximize profit;
- R&D firms choose $\{R_t\}$ to maximize profit taking $\{r_t, v_t\}$ as given;
- the market-clearing condition for final good holds such that $y_t = R_t + N_t x_t + c_t$;
- the government balances budget given by $\tau_t = b_t\left(L - l_t\right)$.

2.7 Employment and economic growth

To solve for equilibrium employment, we substitute (4) and (6) into (5) to obtain

$$\Pi_t = (1-\beta)(l_t)^\alpha \int_0^{N_t} [x_t(i)]^\beta di - w_t l_t = (1-\beta) y_t - w_t l_t. \tag{18}$$

Substituting (18) into the bargaining solution in (10) yields the labor income share given by

$$\frac{w_t l_t}{y_t} = \alpha + \theta(1-\alpha-\beta) \equiv s, \tag{19}$$

which is increasing in union bargaining power θ. Then, substituting (19) into (18) yields

$$\frac{\Pi_t}{y_t} = (1-\theta)(1-\alpha-\beta), \tag{20}$$

which is decreasing in θ. Substituting (19), (20) and $b_t = \bar{b} y_t$ into the bargaining solution in (9) yields

$$l_t = \frac{\alpha + (1-\omega)\theta(1-\alpha-\beta)}{\bar{b}} \equiv l < L, \tag{21}$$

where employment l is decreasing in the union's wage orientation ω but the effect of its bargaining power θ depends on the union being wage-oriented or employment-oriented.

Lemma 1 *Employment is decreasing (increasing) in bargaining power θ if $\omega > 1$ ($\omega < 1$).*

Proof. Use (21). ■

Assuming positive R&D, we obtain $v_t = \mu$, which in turn implies $\dot{v}_t = 0$. Substituting $\dot{v}_t = 0$ into (16) yields the equilibrium invention value given by

$$v = \frac{\pi}{r} = \frac{\eta - 1}{r} \left[\frac{\beta l^\alpha}{\eta}\right]^{1/(1-\beta)} \Leftrightarrow r = \frac{\eta - 1}{\mu} \left[\frac{\beta l^\alpha}{\eta}\right]^{1/(1-\beta)}, \tag{22}$$

which uses (13) and $v = \mu$. Finally, from (3), the equilibrium growth rate of consumption is[9]

$$g = r - \rho = \frac{\eta - 1}{\mu} \left[\frac{\beta l^\alpha}{\eta}\right]^{1/(1-\beta)} - \rho > 0, \tag{23}$$

which is increasing in employment l.

Lemma 2 *Economic growth is decreasing (increasing) in bargaining power θ if $\omega > 1$ ($\omega < 1$).*

Proof. Use (21) and (23). ■

[9]It can be shown that g is also the equilibrium growth rate of y_t and N_t.

3 Labor union and the wealth-income ratio

In the model, wealth comes from the ownership of two types of assets: $a_t = a_{1,t} + a_{2,t}$, where $a_{1,t} = N_t v_t = N_t \pi_t / r_t$ is the value of intermediate-good firms, and $a_{2,t}$ is the value of final-good firms. Its value follows a no-arbitrage condition: $r_t a_{2,t} = \Pi_t + \dot{a}_{2,t}$, where $a_{2,t} = \Pi_t/\rho$ because Π_t grows at the same rate as y_t as (20) shows. The equilibrium wealth-income ratio is

$$\frac{a}{y} = \frac{N\pi}{ry} + \frac{\Pi}{\rho y}. \tag{24}$$

From (20), we have

$$\frac{\Pi}{\rho y} = \frac{(1-\theta)(1-\alpha-\beta)}{\rho}, \tag{25}$$

which is decreasing in union bargaining power θ. From (4) and (13), we derive

$$\frac{N\pi}{ry} = \frac{(\eta-1)\, x^{1-\beta}}{rl^{\alpha}} = \frac{\eta-1}{\eta}\frac{\beta}{\rho+g(\theta)} = \frac{\mu}{l(\theta)^{\alpha/(1-\beta)}}\left(\frac{\eta}{\beta}\right)^{\beta/(1-\beta)}, \tag{26}$$

which is decreasing in growth $g(\theta)$ and employment $l(\theta)$. The second equality of (26) uses (3) and (12), whereas the third equality uses (23).

Substituting (25) and (26) into (24) yields

$$\frac{a}{y} = \frac{\mu}{l(\theta)^{\alpha/(1-\beta)}}\left(\frac{\eta}{\beta}\right)^{\beta/(1-\beta)} + \frac{(1-\theta)(1-\alpha-\beta)}{\rho}, \tag{27}$$

where $l(\theta)$ is given by (21). A decline in union bargaining power θ increases the value of final-good firms $\Pi/(\rho y)$. This is a positive effect on the wealth-income ratio, and the magnitude of this effect is decreasing in the discount rate ρ. However, θ also has a general-equilibrium effect on the value of intermediate-good firms $N\pi/(ry)$ through employment l and growth g, which affects the rate of variety expansion (i.e., the rate at which a firm loses its market share) and the value of intermediate-good firms. The sign of this effect depends on the union's wage orientation ω. The following proposition summarizes these effects of θ on a/y.

Proposition 1 *Given $\omega \leq 1$, a decrease in union bargaining power θ leads to an increase in the wealth-income ratio a/y. Given $\omega > 1$, a decrease in union bargaining power θ would lead to an increase in the wealth-income ratio a/y if and only if ρ is below a threshold.*

Proof. In (27), $(1-\theta)(1-\alpha-\beta)/\rho$ is decreasing in θ. From (21) and (23), l and g are increasing in (independent of) θ if $\omega < 1$ ($\omega = 1$). Therefore, a/y is decreasing in θ if $\omega \leq 1$. As for $\omega > 1$, we differentiate (27) with respect to θ to obtain

$$\frac{\partial a/y}{\partial \theta} = \frac{(\omega-1)(1-\alpha-\beta)\alpha\mu}{\bar{b}(1-\beta)l(\theta)^{(\alpha+1-\beta)/(1-\beta)}}\left(\frac{\eta}{\beta}\right)^{\beta/(1-\beta)} - \frac{1-\alpha-\beta}{\rho}, \tag{28}$$

which is negative if and only if ρ is sufficiently small. ■

Figure 1 shows that labor income share s decreases from 0.63 in 1978 to 0.59 in 2007. Assuming that this decrease in s is driven by a decrease in θ, we can calibrate other parameter values and simulate the effect of the decrease in θ on the wealth-income ratio:

$$\frac{a}{y} = \frac{\eta - 1}{\eta} \frac{\beta}{\rho + g(\theta)} + \frac{1 - \beta - s(\theta)}{\rho}, \tag{29}$$

which is obtained by substituting (19) and (26) into (27).

Given the importance of the discount rate as shown in Proposition 1, we consider a range of values for $\rho \in [0.03, 0.06]$. We consider a markup ratio η of 1.25, which takes on an intermediate value of the range reported in Jones and Williams (2000).[10] We assume a labor intensity α of 0.5. We calibrate the value of μ using a long-run growth rate g of 0.02. We calibrate the value of β by matching a wealth-income ratio of 3.74 in the US in 1978. We normalize L to unity and calibrate the value of $\bar{b}$ using an unemployment rate of 0.07 in the US in 1978. Then, we calibrate the value of ω by matching the decrease in the unemployment rate from 0.07 in 1978 to 0.05 in 2007; see Figure 5.[11] Table 1 summarizes the calibrated parameter values and the simulation results.

Table 1: Calibrated parameter values and simulation results

ρ	η	α	μ	β	$\bar{b}$	ω	θ_{1978}	θ_{2007}	a/y_{1978}	a/y_{2007}
0.03	1.25	0.50	0.62	0.30	0.49	1.32	0.62	0.46	3.74	4.80
0.04	1.25	0.50	0.48	0.26	0.49	1.32	0.52	0.39	3.74	4.54
0.05	1.25	0.50	0.37	0.22	0.49	1.32	0.45	0.33	3.74	4.38
0.06	1.25	0.50	0.28	0.18	0.49	1.32	0.39	0.29	3.74	4.27

Figure 6 plots the simulated paths of the wealth-income ratio using the calibrated paths of union bargaining power θ computed from the HP-filter trend of the US labor income share in Figure 2. Under a relatively high discount rate of 0.06, the wealth-income ratio in the model increases from 3.74 in 1978 to 4.27 in 2007, which explains one-third of the increase in the US wealth-income ratio. Under a lower discount rate of 0.03, the wealth-income ratio in the model increases from 3.74 in 1978 to 4.80 in 2007, which explains as much as two-thirds of the increase in the US wealth-income ratio.

4 Conclusion

We have explored the effects of union bargaining power in an R&D-based growth model and found that a decrease in union bargaining power causes a sizable increase in the US wealth-income ratio. We should emphasize that our quantitative results should be viewed as illustrative given our stylized model. Nevertheless, we believe that our study serves as a useful step towards understanding the relationship between de-unionization and the rising wealth-income ratio.

[10] In the online appendix, we explore other parameter values to ensure the robustness of our results.
[11] Data source: US Bureau of Labor Statistics.

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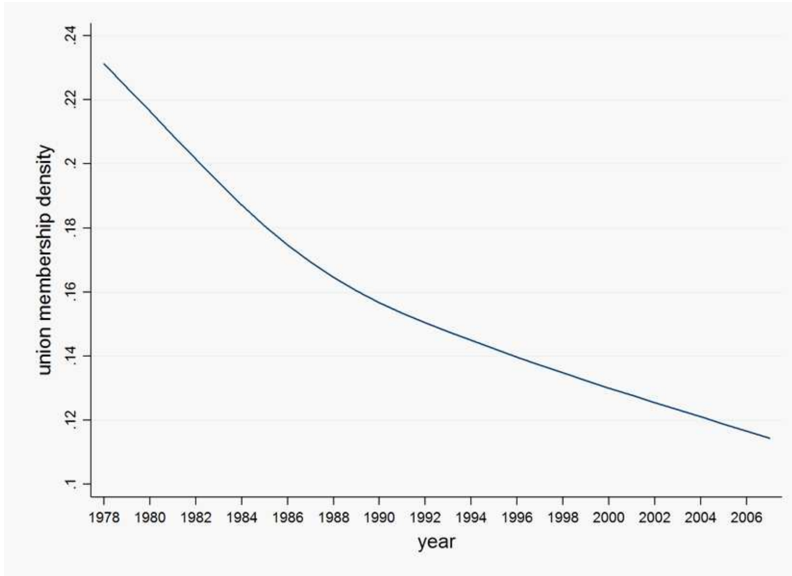

Figure 1: HP-filter trend of US union membership density

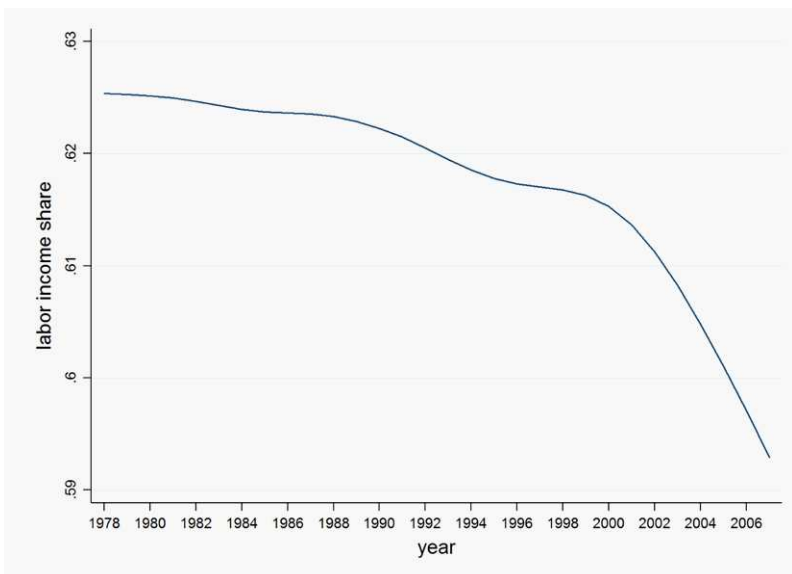

Figure 2: HP-filter trend of US labor income share

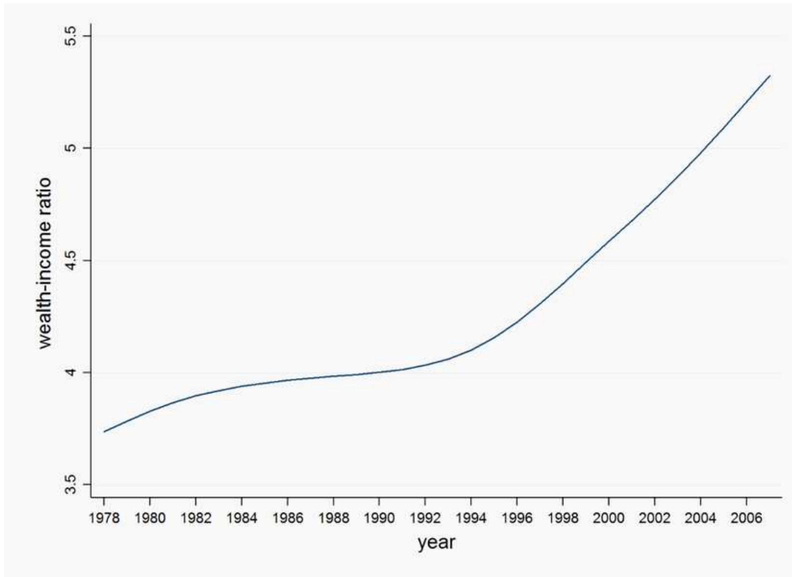

Figure 3: HP-filter trend of US wealth-income ratio

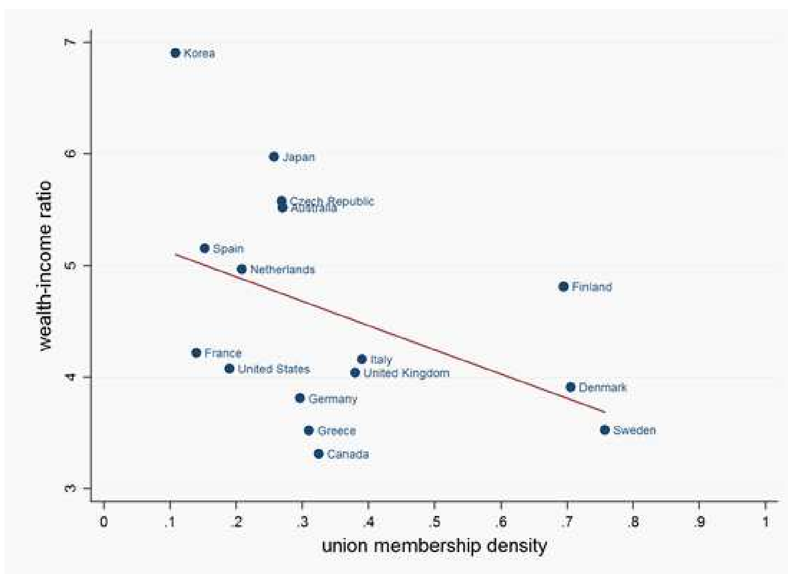

Figure 4: Union membership density and wealth-income ratio

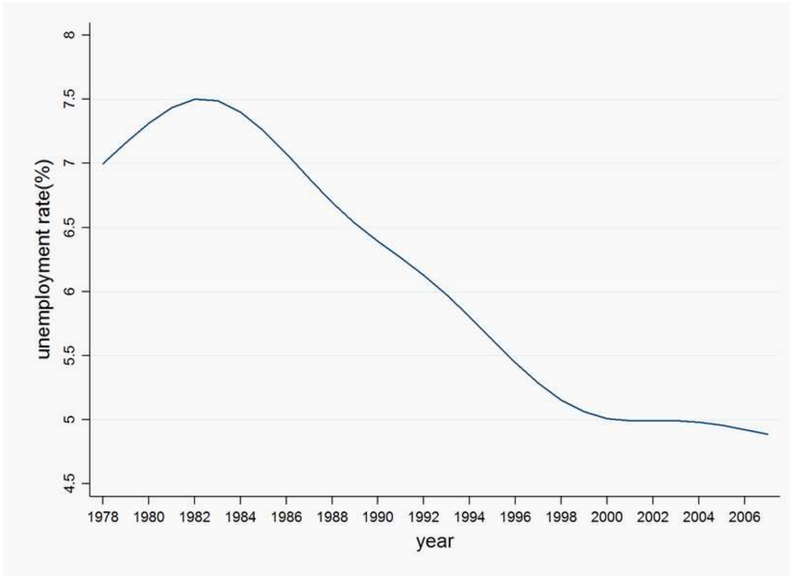

Figure 5: HP-filter trend of US unemployment rate

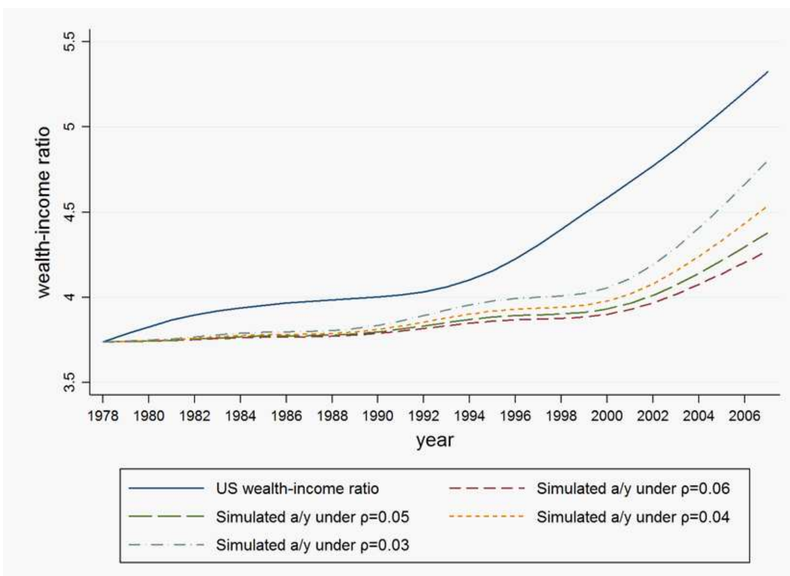

Figure 6: Simulated paths of the wealth-income ratio

Online Appendix

In this appendix, we perform robustness checks on our simulation results. First, we consider a range of values for the markup ratio $\eta \in \{1.05, 1.40\}$ as reported in Jones and Williams (2000). The other parameters are calibrated to the same moments as before. Tables A1 and A2 summarize the calibrated parameter values and the simulation results, which are largely similar to the results in Table 1.

Table A1: Calibration and simulation for $\eta = 1.05$										
ρ	η	α	μ	β	$\bar{b}$	ω	θ_{1978}	θ_{2007}	a/y_{1978}	a/y_{2007}
0.03	1.05	0.50	0.15	0.27	0.49	1.32	0.55	0.40	3.74	4.82
0.04	1.05	0.50	0.11	0.23	0.49	1.32	0.47	0.35	3.74	4.55
0.05	1.05	0.50	0.08	0.19	0.49	1.32	0.41	0.30	3.74	4.39
0.06	1.05	0.50	0.06	0.16	0.49	1.32	0.36	0.27	3.74	4.28

Table A2: Calibration and simulation for $\eta = 1.40$										
ρ	η	α	μ	β	$\bar{b}$	ω	θ_{1978}	θ_{2007}	a/y_{1978}	a/y_{2007}
0.03	1.40	0.50	0.86	0.32	0.49	1.32	0.68	0.51	3.74	4.79
0.04	1.40	0.50	0.68	0.28	0.49	1.32	0.57	0.42	3.74	4.53
0.05	1.40	0.50	0.53	0.24	0.49	1.32	0.47	0.35	3.74	4.37
0.06	1.40	0.50	0.41	0.19	0.49	1.32	0.41	0.30	3.74	4.27

Second, we consider calibrating the value of μ by targeting a long-run technology growth rate of $g = 0.01$, instead of the per capita GDP growth rate. Once again, we consider a range of values for the markup ratio $\eta \in \{1.05, 1.40\}$. The other parameters are calibrated to the same moments as before. Tables A3 and A4 summarize the calibrated parameter values and the simulation results, which are once again largely similar to the results in Table 1.

Table A3: Calibration and simulation for $\eta = 1.05$ and $g = 0.01$										
ρ	η	α	μ	β	$\bar{b}$	ω	θ_{1978}	θ_{2007}	a/y_{1978}	a/y_{2007}
0.03	1.05	0.50	0.19	0.27	0.49	1.32	0.55	0.41	3.74	4.82
0.04	1.05	0.50	0.13	0.23	0.49	1.32	0.47	0.35	3.74	4.55
0.05	1.05	0.50	0.10	0.20	0.49	1.32	0.41	0.31	3.74	4.39
0.06	1.05	0.50	0.07	0.16	0.49	1.32	0.37	0.27	3.74	4.28

Table A4: Calibration and simulation for $\eta = 1.40$ and $g = 0.01$										
ρ	η	α	μ	β	$\bar{b}$	ω	θ_{1978}	θ_{2007}	a/y_{1978}	a/y_{2007}
0.03	1.40	0.50	1.10	0.33	0.49	1.32	0.76	0.56	3.74	4.78
0.04	1.40	0.50	0.83	0.29	0.49	1.32	0.60	0.45	3.74	4.52
0.05	1.40	0.50	0.63	0.25	0.49	1.32	0.49	0.37	3.74	4.37
0.06	1.40	0.50	0.48	0.20	0.49	1.32	0.42	0.31	3.74	4.27

Finally, we consider other values for labor intensity $\alpha \in \{0.45, 0.55\}$. We assume $\eta = 1.25$ and $g = 0.02$ as in the paper. The other parameters are also calibrated to the same moments as before. Tables A5 and A6 summarize the calibrated parameter values and the simulation results, which are once again largely similar to the results in Table 1.

Table A5: Calibration and simulation for $\alpha = 0.45$										
ρ	η	α	μ	β	$\bar{b}$	ω	θ_{1978}	θ_{2007}	a/y_{1978}	a/y_{2007}
0.03	1.25	0.45	0.62	0.30	0.43	1.28	0.70	0.57	3.74	4.80
0.04	1.25	0.45	0.48	0.26	0.43	1.28	0.60	0.49	3.74	4.54
0.05	1.25	0.45	0.37	0.22	0.43	1.28	0.53	0.43	3.74	4.38
0.06	1.25	0.45	0.28	0.18	0.43	1.28	0.47	0.38	3.74	4.27

Table A6: Calibration and simulation for $\alpha = 0.55$										
ρ	η	α	μ	β	$\bar{b}$	ω	θ_{1978}	θ_{2007}	a/y_{1978}	a/y_{2007}
0.03	1.25	0.55	0.61	0.30	0.56	1.37	0.50	0.28	3.74	4.80
0.04	1.25	0.55	0.47	0.26	0.56	1.37	0.40	0.23	3.74	4.54
0.05	1.25	0.55	0.36	0.22	0.56	1.37	0.33	0.19	3.74	4.38
0.06	1.25	0.55	0.28	0.18	0.56	1.37	0.28	0.16	3.74	4.27