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Does Globalization Lead to a Rat Race of National Labor-Market Institutions?

Summary: Since just around 30 years we observe that the labor's share of the national income decreases in most countries. In this paper, we introduce an endogenous overlapping generation growth model with an institutional setting of the labor market to show that the changes of the labor-market institutions are one main reason for the decrease of the labor's share. These changes are mainly caused by the increasing globalization resulting in open capital markets and as a consequence in a competition between countries with respect to the labor-market institutions. In the long run, all will suffer. The only ways to stop this rat race are capital controls or international agreements on the labor-market institutions.

Key words: Endogenous growth, Open economies, Labor's share, Labor market institutions.

JEL: F12, F59, F43.

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In this paper, we investigate whether the competition between countries regarding to attract mobile capital, is a way to enhance the economic welfare in all involved countries in the long run, as it is promised by "globalists" (Tadija Tadić 2006a). Tadić (2006a, b) gives an overview about the different views about globalization. The "skeptics", as Tadić (2006b) calls them, argue that the increasing international competition does not enhance the welfare of the average citizens and in fact, harms the working class and the poor people worldwide. The skeptics claim that the process of globalization is only in favor of capital owners and rich people on the back of high competition resulting in slashing the social standards of employees and the rights of labor unions, and compromising national economic and social security policy. In principle, the critical argument is that it is impossible to realize gains from trade for all societal groups if unfair competition combined with missing international labor and social security standards exists.

Standard theory of trade like the Heckscher-Ohlin theory or Ricardo theory tells us that the opening of markets is welfare enhancing for all involved economies, but not necessarily for all members of them. Especially since the mid of the 1970s we observe that the income share of labor is decreasing in most countries. Using the numbers from the national accounts; in the time between 1995 and 2008, the labor income share in Germany declined from 72% to 65%. Even in countries like India the labor income share decreased from 44.9% in 1995 to 35.9% in 2005. A huge amount of literature confirms this view, for example, Olivier Blanchard (1997), and Anne E. Harrison (2002). However, the explanations for the decrease are mainly based on neoclassical arguments, like changes of the factor productivity, changes of the capital-labor ratio, and changes of the elasticity of labor demand.

Though, Harrison and Margaret McMillian (2006), Harrison and Edward E. Leamer (1997) or Samuel Bentolila and Gilles Saint Paul (2003) pointed out that the bargaining power of workers plays a crucial role in explaining the decline of the labor's income share, where this argument does not play a role in neoclassical models. Here we offer a new approach to incorporate this important aspect in an endogenous growth model. Therefore, we concentrate on the bargaining power of labor and its influence on the labor's income share. Especially, in the last 30-40 years the bargaining power of labor unions has decreased sharply, which was mainly caused by changes of the labor-market institutions. For example, this happened in Great Britain under the Thatcher government, in the USA under the Reagan government or in Germany under the Schröder government. Because of the lower bargaining power of labor unions, the incentive for workers to join a union has also decreased, which of course caused a further decrease of the bargaining power of labor unions. Similar policy measures were applied more or less in all developed countries.

Particularly, we analyze the effects of a transition from a closed economy to an economy with open capital markets and the influence of the opening on the institutional settings of a country. The approach is, in some way related to Willem H. Buiter (1981), who uses Peter A. Diamond's (1965) standard overlapping generations (OLG) model in combination with a neoclassical production function. He analyzes international borrowing and lending. In his model, different time preference rates of individuals are responsible for differences between countries. The differences in our analysis are caused by different national labor-market institutions. We show that international competition and open capital markets lead to a rat race to attract capital from abroad, as long as international cooperation does not take place.

In the first section, we introduce an OLG-model with a Leontief production function in a closed economy. In the second section, we investigate what happens if the country opens its capital market. This is followed by an analysis of the transition from autarky to an open world capital market for the case of a small country and the case of two countries.

1. The Model

On the consumer side, we use an OLG approach introduced by Paul A. Samuelson (1958) and Diamond (1965). We use this approach, because otherwise we could not so easily identify the capital owners and workers. Additionally, the well-known alternative Ramsey-Cass-Koopmans model is nothing else than an OLG-model with perfect intergenerational altruism. Implicitly, we can interpret the savings in the OLG model as voluntary contributions to a capital funded pension system.

The distribution of income is thus a distribution of national income between workers and pension funds, which are the shareholders of the firms. In so far an OLG model without altruism seems to be more appropriate to model the real world than a model with perfect intergenerational altruism.

We assume a twice continuously differentiable, homothetic, strictly quasi-concave utility function with the usual characteristics:

$$U_t = U(c_t^1, c_{t+1}^2), \tag{1}$$

where c_t^1 is the consumption in the first life period of an individual born in period t and c_{t+1}^2 is the consumption in the second life period of an individual born in period t. This representative consumer lives two periods. After determining the labor time, she offers it inelastically and receives a wage income. In the second period of life, she retires and consumes her savings and interest income. We calculate the optimal labor time below. After solving the time allocation problem the intertemporal budget restriction is given by:

$$c_t^1 + \frac{c_{t+1}^2}{1+R_{t+1}} = w_t, \tag{2}$$

where w_t is the wage income and R_{t+1} the interest rate. However, besides the intertemporal allocation problem, the individual has as well to solve a time allocation problem in period one. By assumption, leisure plays no role in this model, but the individual has to solve a trade-off between working time and educational time, where the total time is normalized to one. The acquired knowledge enhances immediately the labor productivity of the individual and hence the wage income. The wage income depends on the working time and the acquired human capital of an individual.

$$w_t = \widetilde{w}_t h(u_t) u_t = \widetilde{w}_t K_t (1-u_t)^\beta u_t. \tag{3}$$

The variable $\widetilde{w}_t$ is the wage rate per effective labor unit, which is given by the market, u_t represents the working time, and (4) represents the human capital. The amount of effective labor units equals $h(u_t)u_t$.

$$h(u_t) = K_t (1-u_t)^\beta \ . \tag{4}$$

The human capital depends on the duration of education $1 - u_t$, the available stock of knowledge, which is related to the capital stock K_t and the learning parameter $\beta > 0$. The positive externality generated by the capital stock can be justified by the argument, that knowledge is embodied in the capital stock. For example, if someone wants to work with a computer, she needs a computer and has to invest time to learn how to use it. This argument is very close to the considerations of Paul M. Romer (1986, 1989) on positive externalities. As we see, the individual has to solve two problems, to maximize her utility. At first, the individual has to maximize her income by determining the optimal duration of educational and working time. This can be done separately, because the time allocation does not influence the intertemporal allocation problem. Therefore, at first the individual maximizes her wage income by choosing the optimal u_t. Maximizing the RHS of (3) with respect to u_t leads immediately to:

$$u_t^* = \frac{1}{1+\beta} = u^*. \tag{5}$$

Obviously, the optimal time allocation is independent of the period, the wage rate per effective labor unit, and the capital stock. It only depends on the learning parameter β.The second step of the individual is to determine the optimal intertemporal allocation of her wage income between current consumption and future consumption. This problem can be solved by a Lagrangian approach, taking (1) and (2) into account:

$$\max_{c_t^1, c_{t+1}^2, \lambda} \mathcal{L}(c_t^1, c_{t+1}^2, \lambda) = U(c_t^1, c_{t+1}^2) - \lambda\left(c_t^1 + \frac{c_{t+1}^2}{1+R_t} - w_t\right). \tag{6}$$

The resulting necessary conditions are given by the budget constraint (2) and the usual intertemporal optimality condition.

$$\frac{U_1(c_t^1, c_{t+1}^2)}{U_2(c_t^1, c_{t+1}^2)} = 1 + R_{t+1}. \tag{7}$$

Using (2), (7) and the assumption that the utility function is homothetic, we can write the savings function in the following way:

$$s_t(w_t, R_{t+1}) = \mathrm{s}(R_{t+1})w_t. \tag{8}$$

Clearly, the average savings rate $\mathrm{s}(R_{t+1})$ fulfills $1 \geq \mathrm{s}(R_{t+1}) \geq 0$. We assume that $1 \geq \frac{\partial \mathrm{s}(R_{t+1})}{\partial R_{t+1}} \geq 0$. This means that the interest elasticity of the savings is positive, which seems to be plausible, if we take the empirical results of Thorvaldur Gylfason's (1993) survey into account. Because of the homotheticity assumption, the savings are a linear function of the wage income.

Regarding the production side of the economy, we use a modified approach of Carlie Geerdink and Peter J. Stauvermann (2005, 2006). As they, we reject the idea that the factor prices are technically determined by the production function. Instead, we assume that wages and profits are a result of a labor dispute or collective bargaining. The outcome of a labor dispute depends on the institutional setting of the economy. For example, the government can introduce a minimum wage, labor laws, industrial laws, and other regulations. On the other hand, the capital owners can lock out workers, dismiss them and so forth. To formalize the idea, we use a modified conflict model of Jack Hirshleifer (1989) and Stergios Skaperdas (1996). To set up the model formally, we use a contest success function in the following bargaining process. The workers get the share $(1 - \alpha)$ of the output and the capital owners receive the remaining share α. Following the definition of the System of National Accounts 1995, the labor's income share includes: wages, piece payments, salaries, tips, bonuses, fringe benefits, commissions, and employer's contributions to social security programs, pension schemes, health plans and other social benefit packages.

The outcome of a labor dispute depends in general on the efforts of the workers, efforts of the employers, the labor laws and union laws. Thus, the institutional setting of the labor market is decisive for the outcome of the dispute. The function $\alpha(G_C, G_L, g_C, g_L) = \frac{g_C + G_C}{g_L + G_L + g_C + G_C}$ is a distribution function, which determines the income share of the capital owners. The variables g_L and g_C represent the stakes or efforts of the workers and the capital owners (e.g. times of strike and times of lock-out) to get a bigger share of the production Y. The capital owners maximize the capital income:

$$R_t K_t = \alpha(G_C, G_L, g_C, g_L) Y_t - g_c = \frac{g_C + G_C}{g_L + G_L + g_C + G_C} Y_t - g_C. \tag{9}$$

We assume that the depreciation rate of capital is zero. The workers maximize their aggregate wage income, where $w_t N_t = \widetilde{w}_t h_t(u^*) u^* N_t$ and N_t is the number of workers.

$$w_t N_t = \big(1 - \alpha(G_C, G_L, g_C, g_L)\big) Y_t - g_L = \frac{(g_L + G_L)}{(g_L + G_L + g_C + G_C)} Y_t - g_L. \tag{10}$$

The variables G_L and G_C represent the institutional setting of labor disputes. The industrial laws (e.g. minimum wage, dismissal protection laws), labor laws and so on define the institutional setting, which is under the control of the government.

If workers and capital owners maximize their incomes with respect to their efforts g_L and g_C we get the following best response functions:

$$g_L = -(G_L + g_C + G_C) + \sqrt{Y_t(G_L + g_L)}, \tag{11}$$

$$g_C = -(G_L + g_L + G_C) + \sqrt{Y_t(G_C + g_C)}. \tag{12}$$

Solving this system, we get the Cournot-Nash equilibrium of the labor dispute:

$$g_C^* = \frac{Y_t}{4} - G_C \text{ and } g_L^* = \frac{Y_t}{4} - G_L. \tag{13}$$

To simplify the analysis, we assume without loss of generality that $\min[G_C, G_L] \geq \frac{Y_t}{4}$ and that G_L and G_C grow with the same rate as the production. That means, that the outcome of the labor dispute depends only on the institutional arrangement in the country, and $g_L = g_C = 0$. Under these circumstances, the institutional setting of the labor market is efficient, because nothing is lost in labor disputes. If $g_L > 0$ and/or $g_C > 0$ hold, the labor dispute provokes additional costs, which can be interpreted as transaction costs. Given the assumption above, the distribution function simplifies to $\alpha(G_C, G_L) = \frac{G_C}{G_C + G_L}$. This implies, the more left-wing the government is, the lower is the ratio G_C / G_L. If the government is more likely to be right-wing or capital owner friendly, the opposite holds. The function $\alpha(G_C, G_L)$ has some nice properties, these are: (a) $\frac{\partial \alpha(G_C, G_L)}{\partial G_C} = -\frac{\partial[1 - \alpha(G_C, G_L)]}{\partial G_C}$ and $\frac{\partial \alpha(G_C, G_L)}{\partial G_L} = -\frac{\partial[1 - \alpha(G_C, G_L)]}{\partial G_L}$, and (b) the shares add up to 1. Because of these characteristics, we write for simplicity $\alpha(G_L)$ instead of $\alpha(G_C, G_L)$. The first derivative is $\alpha'(G_L) < 0$.

Here we analyze only effects caused by a change of labor laws. This is caused by the fact that increased labor rights laws means implicitly a reduction of the capital owner's rights and the other way around.

Now we come to the production function, which is a Leontief production function. The reason is that we reject the idea of the substitutability of input factors and especially the idea that capital is malleable, because, in reality, we observe that the scarcest input factor determines the production. Because of space restrictions, we cannot go into the details of the discussion and refer to Geerdink and Stauvermann (2005, 2006). The production function here allows never-ending endogenous growth, which is not the case in Geerdink and Stauvermann (2005, 2006). In the former models, a steady-state equilibrium results in the long run. In the modified model, the physical capital accumulation is the driver of growth, which also drives the human capital accumulation. In some sense, the model here is an advancement of the older model.

The variable H_t represents the total amount of effective labor units.

$$Y_t = A\min[K_t, H_t] = A\min[K_t, h_t(u^*)u^*N_t] \tag{14}$$

Simplifying and using (4) gives:

$$Y_t = AK_t\min\left[1, (1-u^*)^{\beta}u^*N_t\right]. \tag{14'}$$

By using (5) the production is given by:

$$Y_t = \begin{cases} AK_t, \text{if } 1 \leq \left(\frac{\beta}{1+\beta}\right)^{\beta}\frac{1}{1+\beta}N_t \\ AK_t\left(\frac{\beta}{1+\beta}\right)^{\beta}\frac{1}{1+\beta}N_t, \text{if } 1 > \left(\frac{\beta}{1+\beta}\right)^{\beta}\frac{1}{1+\beta}N_t \end{cases}. \tag{15}$$

The second sub-equation of (15) is irrelevant, if $\left(\frac{\beta}{1+\beta}\right)^{\beta}\frac{1}{1+\beta}N_t \geq 1$ holds. The parameter β has to be sufficiently small and the population size sufficiently large. The lower β is the more effective is the learning technology. However, this feature does not exist in Romer (1986). In his model, growth occurs if there is only one human, and if the population grows, the resulting growth rate increases from period to period.

In this model, the economy can be stuck in a low development trap, if the learning technology is sufficiently ineffective or if the population size is sufficiently small.

To analyze the situation of developed countries, we assume that $\left(\frac{\beta}{1+\beta}\right)^{\beta}\frac{1}{1+\beta}N_t > 1$ holds and that $N_t = (1+n)^t$, where $n \geq 0$. In this case, we observe unemployment, because the physical capital stock is smaller than the human capital stock; $K_t < H_t$ and hence the physical capital stock determines the production. We can define the unemployment rate as $UE_t = \frac{H_t - K_t}{H_t} = 1 - \frac{(1+\beta)^{1+\beta}}{\beta^{\beta}N_t}$. Even that it would be interesting to analyze policy measures how to deal with this unemployment; we assume for simplicity that the total working hours are distributed equally between all workers. Therefore, the total working hours of the economy decrease in the long run. Now we concentrate on the long-run development. The production function (15) reduces to:

$$Y_t = AK_t. \tag{16}$$

Now we can determine the wage income, capital income, savings, and growth rates. Using $g_L = g_C = 0$, and (16) in combination with (9) and (10), the factor prices are given by:

$$w_t = \widetilde{w}_t h_t(u^*)u^* = \big(1 - \alpha(G_L)\big)A\frac{K_t}{N_t} \tag{17}$$

and,

$$R_t = \alpha(G_L)A. \tag{18}$$

Obviously, the workers distribute the aggregate wage incomes proportionally to the effective labor units. Consequently,$\widetilde{w}_t = \frac{(1-\alpha(G_L))AK_t}{h_t(u^*)u^*N_t}$ holds. The factor prices are determined by the labor protection laws, labor laws, right to strike and compulsory contributions of the employers to the social security system or health insurance. If $\alpha(G_L)$=1, the interpretation would be that the capital owners would be expropriated, if $\alpha(G_L)$=0, the employees would live like slaves. Using the savings function (8) and the wage rate (17), we can determine the savings per capita:

$$s_t = s(R_t)w_t = s(\alpha(G_L)A)\big(1 - \alpha(G_L)\big)A\frac{K_t}{N_t}. \tag{19}$$

Consequently, the aggregate savings are given by:

$$S_t = s(\alpha(G_L)A)\big(1 - \alpha(G_L)\big)AK_t. \tag{20}$$

In a next step, we take the capital market clearing condition into account:

$$s(\alpha(G_L)A)\big(1 - \alpha(G_L)\big)AK_t = K_{t+1}. \tag{21}$$

A reformulation gives the growth rate of the capital stock *G*:

$$1 + G = \frac{K_{t+1}}{K_t} = s(\alpha(G_L)A)\big(1 - \alpha(G_L)\big)A. \tag{22}$$

It should be clear that all aggregate variables, except the population grow with the rate *G*. The per-capita variables grow with the rate $g = \frac{G-n}{1+n}$. Additionally, given the per-capita savings, the equilibrium consumption of the young and old equals:

$$c_t^{1*} = \left(1 - s(\alpha(G_L)A)\right)\left(1 - \alpha(G_L)\right)A\frac{K_t}{N_t} \quad \text{and} \\ c_t^{2*} = [1 + \alpha(G_L)A]\frac{K_t(1+n)}{N_t}. \tag{23}$$

To close the model, we analyze what happens regarding the growth rate if we change the institutional setting:

$$\frac{\partial G}{\partial \alpha} = s'(\alpha(G_L)A)A^2\left(1 - \alpha(G_L)\right) - s(\alpha(G_L)A)A \tag{24}$$

The derivative is positive, if:

$$\frac{\partial s(\alpha(G_L)A)}{\partial \alpha}\frac{\alpha A}{s(\alpha(G_L)A)} > \frac{\alpha(G_L)}{1-\alpha(G_L)} \Leftrightarrow \ \varepsilon_{s,R} > \frac{\alpha}{1-\alpha}. \tag{25}$$

Proposition 1: An increase of the capital's income share $\alpha(G_L)$ raises the growth rate, if the elasticity of savings $\varepsilon_{s,R}$ regarding to the interest rate exceeds the ratio between the capital's income share and the labor's income share.

We cannot exclude that the condition of proposition 1 holds, if we look at the empirical results of Masao Ogaki, Jonathan Ostry, and Carmen M. Reinhart (1996), Reinhart and Jonathan D. Ostry (1995), and the data of OECD database 2009 on labor's shares. An increase of the growth rate caused by a redistribution from labor income to capital income is likely, if the country is relatively well developed, has a high labor's income share and a low time preference rate. In such a case, the interest rate effect overcompensates the income effect of the redistribution from labor to capital income.

If we take into account realistic values, then the elasticity $\varepsilon_{s,R}$ is near zero or zero and the ratio of the labor's income share to the capital's income share is just around a half. In this case, the redistribution from labor income to capital income reduces the growth rate. Let us now determine the welfare effects of an increase of the capital's income share. We get the equilibrium value of utility of an individual born in *t*, by substituting the values from (22) and (23) into (1) and using the homotheticity assumption.

$$U_t = U\left(\left(1 - s(\alpha A)\right)(1 - \alpha), [1 + \alpha A]s(\alpha A)(1 - \alpha)\right)A\frac{K_t}{N_t}. \tag{26}$$

Taking into account that the utility function is concave, the necessary and sufficient condition for the optimal capital's income share $\alpha(G_L)$ is given by:

$$\frac{U_1\left(c_t^{1*}, c_{t+1}^{2*}\right)}{U_2\left(c_t^{1*}, c_{t+1}^{2*}\right)} = \frac{\left(1-s(\alpha A)\right)A + [1+\alpha A]\left[\frac{\partial s(R)}{\partial R}(1-\alpha) - s(\alpha A)\right]}{\frac{\partial s(R)}{\partial R}(1-\alpha) + 1 - s(\alpha A)}. \tag{27}$$

Our assumptions guarantee that an optimal capital's income share and an optimal G_L exist. However, this does not mean, that these optimal values can be realized without harming any generation. In general, a representative indirect utility function of an individual has the form: $V_t = V\left(w_0\left(\frac{1+G}{1+n}\right)^t, R\right)$. By substituting (17), (18) and (22) in it, we get:

$$V_t = V\left(s(\alpha(G_L)A)\big(1-\alpha(G_L)\big)\frac{K_0}{N_0}\left(\frac{s(\alpha(G_L)A)\big(1-\alpha(G_L)\big)A}{1+n}\right)^t, \alpha(G_L)A\right). \quad (28)$$

Regarding the welfare analysis, the behavior of the growth factor plays the crucial role for all possible changes of parameters. Obviously, we can formulate the following lemma.

Lemma: All policy measures, which lower the growth factor, lead to welfare loss of following generations.

The proof is obvious, because the growth factor is exponentiated by *t* and if a policy measure affects the growth factor negatively, the relevant part in the derivative strives with an increasing number of periods against minus infinity, even if the policy measure can create welfare gains in the short run. With the help of the lemma, we state the following.

Proposition 2: A decrease of the capital's income share harms at least the living old generation. A welfare increase in the sense of Pareto is impossible.

Proposition 3: If $\varepsilon_{s,R} > \frac{\alpha}{1-\alpha}$ holds, a redistribution from labor income to capital income raises the welfare all generations.

According to proposition 1, a redistribution from labor income to capital income increases the growth rate and the interest rate, given the condition of proposition 3. Additionally the welfare of the living young generation increases, and also all other generations gain, because of either the higher interest rate and/ or higher growth rate. The problem is of course, that the condition is rarely fulfilled in reality. An extended formal proof of proposition 2 and 3 can be found in Stauvermann (1997).

Until here, we only analyzed a closed economy. In the next section, we allow the international mobility of capital.

2. A Small Open Economy

Let us assume a small domestic economy and the opening of the capital market. We further assume that the world market interest rate is given by R^W, and that only new capital is mobile; that means only $\Delta K = K_{t+1} - K_t$ is mobile. The existing capital stock remains where it is. If the non-arbitrage condition $R^W = R$ holds, where the domestic economy's interest rate is R, nothing changes, because then the capital owners have no incentive to import or to export capital. However, now let us investigate in the case where $R^W > R$. In this case, the domestic investors, represented by the workers at the end of the first period of life or their pension funds, have an incentive to invest all savings abroad and therefore the domestic growth rate declines. Of course, the only possibility of the domestic government to avoid a decline of its economy would be to change its redistributional policy. This is the only policy option to avoid the outflow of capital. An adjustment of the income distribution by lowering the social standards of workers and /or labor laws has an influence on the growth rate and welfare. If the government increases $\alpha(G_L)$ to halt capital outflows, the interest rate must increase until $R^W = R$ is fulfilled, and the domestic capital owners are better off. At the same time the wage incomes decrease and as discussed above the consequences for the living working class and following generations are unclear, as we know from proposition 2 and 3. Therefore, it depends on the distribution of income and elasticity of savings, if a welfare increase will result or not.

The second relevant case is $R^W < R$; in this case the domestic economy realizes an inflow of capital, which increases the production and wage incomes and consequently the growth rate. In so far, the domestic economy is better off as the consequence.

However, the domestic economy has to expect that the rest of the world will begin to change its institutional settings, so that the interest rate in the rest of the world increases. It seems to be a realistic conclusion, that a competition to the bottom of labor's share will take place, to attract as much as possible capital from abroad. Therefore, worldwide capital owners are better off in the long and short run, and all growth rates except n decrease. We should note that it becomes more unlikely that the condition $\varepsilon_{s,R} > \frac{\alpha}{1-\alpha}$ holds, the higher the capital's income share is.

Proposition 4: If a race to the bottom of labor's income share takes place to attract capital, in the long run the endogenous growth rates will decline, and all countries are worse off by opening the capital market.

3. The Two Country Case

Here we examine the case of two countries to work out the results of the latter section more clearly. All variables of the foreign country are marked with an asterisk. Let us assume that both countries are identical, except for the institutional settings. Let us assume the following:

$$\begin{gathered} Y_t = AK_t \text{ and} \\ Y_t^* = AK_t^* \text{ and} \\ K_t^* = K_t \end{gathered} \tag{29}$$

$$\begin{gathered} w_t = \big(1 - \alpha(G_L)\big)A\frac{K_t}{N_t} \text{ and} \\ w_t^* = \big(1 - \alpha^*(G_L^*)\big)A\frac{K_t^*}{N_t^*}, \end{gathered} \tag{30}$$

where we assume that $N_t = N_t^*$ and $G_L > G_L^*$. Consequently, $\alpha(G_L) < \alpha^*(G_L^*)$ and $w_t > w_t^*$.

$$\begin{gathered} R_t = \alpha(G_L)A \text{ and} \\ R_t^* = \alpha^*(G_L^*)A. \\ \text{Consequently, } R_t^* > R_t. \end{gathered} \tag{31}$$

$$s_t = s(R_t)w_t \text{ and} \\ s_t^* = s(R_t^*)w_t^*. \tag{32}$$

$$1 + G = s(\alpha(G_L)A)\big(1 - \alpha(G_L)\big) \text{ and} \\ 1 + G^* = s^*(\alpha^*(G_L^*)A)\big(1 - \alpha^*(G_L^*)\big)A. \tag{33}$$

$$1 + g = \frac{s(\alpha(G_L)A)\big(1-\alpha(G_L)\big)A}{1+n} \text{ and} \\ 1 + g^* = \frac{s^*(\alpha^*(G_L^*)A)\big(1-\alpha^*(G_L^*)\big)A}{1+n^*}, \tag{34}$$

where we assume that $n^* = n$. Let us now assume that both countries open the capital market in period 0. Then in period 1 the equilibrium values are:

$$K_1 = K_0 \text{ and} \\ K_1^* = s^*(\alpha^*(G_L^*)A)\big(1 - \alpha^*(G_L^*)\big)AK_0^* + s(\alpha(G_L)A)\big(1 - \alpha(G_L)\big)AK_0 - \frac{R_1}{R_1^*}K_0. \tag{35}$$

The domestic economy's savings are invested in the existing domestic capital stock, and the rest of the savings are invested in the foreign country. But mind, the young generation is only willing to pay $\frac{R_1}{R_1^*}K_0$ consumption units in exchange for the existing capital stock K_0, where of course $\frac{R_1}{R_1^*}K_0 < K_0$. This is necessary to equalize the interest rates. Now we calculate the growth rates:

$$G_0 = 0 \text{ and} \\ 1 + G_0^* = s^*(\alpha^*(G_L^*)A)\big(1 - \alpha^*(G_L^*)\big)A + s(\alpha(G_L)A)\big(1 - \alpha(G_L)\big)A - 1. \tag{36}$$

The domestic economy is stagnating and the growth rate in the foreign country increases. Consequently, we can now calculate the wage incomes of both countries:

$$w_1 = \big(1 - \alpha(G_L)\big)A\frac{K_0}{N_1} \text{ and} \\ w_1^* = \big(1 - \alpha^*(G_L^*)\big)A\frac{(1+G_O^*)K_0^*}{N_1^*}. \tag{37}$$

It is obvious that the capital intensity in the domestic economy decreases every period by $g_0 = -\frac{n}{1+n}$. The same holds for the wage income per capita. In the foreign country the capital intensity and wage income per capita grows with $g_O^* = \frac{G_O^*-n}{1+n^*}$, and $R_0 = R_1 < R_0^* = R_1^*$. Because of the lower price of the existing capital stock in the domestic economy, the interest rates are internationally equalized. Then the savings function is given by:

$$S_1 = s(R_0^*)\big(1-\alpha(G_L)\big)AK_0 \ \text{ and}$$
$$S_1^* = s(R_0^*)\big(1-\alpha^*(G_L^*)\big)A(1+G_0^*)K_0^*, \tag{38}$$

and the production is given by:

$$Y_1 = AK_0 \text{ and}$$
$$Y_1^* = A(1+G_0^*)K_0^*. \tag{39}$$

The consequences are clear now; the growth rate in the foreign country increases, and in the long run it will converge against its original growth rate, because each period the additional capital inflow from the domestic country declines, caused by the economic stagnation in the domestic country. However, the foreign country gains in the short and long run, because of the capital inflow. The domestic economy loses in the short and long run, because the wage incomes and the per-capita production decrease, and the unemployment rate increases. In the short run, the domestic capital owners lose, because of the devaluation of the existing capital stock. In the long run, the domestic workers will lose because of the lower capital stock and hence lower wage incomes.

Proposition 5: The opening of the capital market harms all generations of the domestic economy if $R < R^*$.

As it is known from the earlier discussion, the only way to avoid the stagnation or further economic decline is to impose capital controls or to change the institutional setting of the labor market. However, lowering the labor share of income seems to be a good policy to attract capital from abroad and to increase the national income. Given this, it would be not surprising if a Bertrand competition between both countries with respect to labor laws takes place. At the end, it results in a race to the bottom, and the labor's income share will decrease as much as possible. If we look at the data of the labor's income share of the last 35 years (see, for example Malte Lubker 2007), we observe that with an increasing globalization, the share decreased dramatically after 1975 in developed countries, which had mostly high standards of labor laws and of social security systems. The problem is that a kind of unfair competition is taking place, where countries with no or low standards of labor laws compete with countries, which have high standards. We want to note; we do not take into question the results of Ricardo or Heckscher-Ohlin; they are of course right. However, they have assumed fair conditions of competition, which is not the case in the real world. How shall European workers compete against working children in India, which were sold to firm owners and are living in slavery?

Proposition 6: The only way of guarantee the social standards in the domestic economy, is to introduce capital controls or to find an international agreement on labor and social standards.

4. Conclusions

We introduced an endogenous growth model which is based on a Leontief production function, and it has the features as the AK-Model introduced by Sergio Rebelo (1991), but with a microeconomic foundation, where we used the framework of an OLG-model. A second difference to Rebelo's AK model is that in our model, labor is essential and the difference to Romer's (1986) model and others is that population growth does not lead to increasing per-capita growth rates. In our model, the institutional setting of the labor market determines the distribution of income. We use this model to analyze the welfare effects of globalization by opening the capital market. Our results are not in favor of globalization, because some countries lose and some countries gain in the short run. If international competition leads to a rat race, where the country with the lowest social standards and worst labor laws is the scale to reach, worldwide the growth rates will decline, and all countries will be worse off in the long run. It seems to be that this theory is better able to explain the decline of the labor's income share than standard neoclassical explanations. The general problem of globalization seems to be that a competition to the bottom with respect to the bargaining power of labor unions and workers is taking place. Or, as Nicole Attia and Valerie Bérenger (2009, p. 17) stated with respect to the social convergence of the European Union "A common philosophy clearly appears: the Welfare State is receding, calling more and more upon market mechanisms." The German chancellor Angela Merkel confirms this daily in her statements with respect to Greece, Italy, Portugal and Spain. Additionally, it must be feared that this competition will lead to lower growth rates worldwide than otherwise. As long as there are no international agreements with respect to labor laws and minimum standards of social security systems, globalization and open markets harm many countries, hitting the least developed and those with poor labor laws the hardest. In countries with such competing situations, it is virtually difficult to address child labor issues. According to UNICEF (2011), an estimated 158 million children aged 5-14 are engaged in child labor, that is 1/6 of all children in the world. What we need internationally is an agreement on labor laws and labor conditions. Otherwise, the working class has to pay the price. Moreover, the price is partly very high; only in China every year thousands of miners are dying because of missing industrial safety regulations. According to the Chinese Academy of Social Sciences (2006), in China died in 2003 130 times more miners per million tons of coal than in the USA, 250 times more than in Australia and 10 times more than in Russia.

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