Voting on redistribution

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Abstract

Redistribution has gained attention in the political process in the last decades. At present, a share of 22 percent of the GDP is related to social expenditures and serves redistributive purposes. In the literature, first approaches deal with aspects of income inequality and its impact on public policy. Newer models integrated aspects of upward mobility, partisan behavior and taxation. While most of the approaches only refer to transfers as the only form of public expenditures, including public goods changes the picture. With two population subgroups, incentives when voting for redistribution depend on whether an individual is taxpayer or benefits from public transfers. Moreover, in times of an aging population, the group of transfer recipients, especially retirees, becomes the dominant group thereby gaining more electoral weight than the group of employees.

Keywords: transfers, voting, political process
JEL: H23, H53, D72

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1 Motivation

The analysis of magnitude, composition and development of public expenditures is important when discussing aspects of redistribution. In the context of social and economic progress, expectations on public policy have generally changed over time and increased regarding social security (see Nagel (2004), p. 138). Basic elements of public expenditures are the provision of public goods, the pursuit of redistributive objectives and the impact on the macro economy (Musgrave (1999a), p. 31 and Musgrave (1999b), p. 69). By providing public goods, governments aim at the availability of complementary goods for private production. The design of tax systems and transfer mechanisms is part of redistributive policies and macro policies are relevant for stabilizing the economy in a Keynesian sense. All three categories are not independent and influence the development and the size of government. In the last decades, especially social security and hence redistribution has gained attention. There is an international trend towards a higher share of social expenditures. In an analysis of eighteen OECD countries, Castles shows that the share of GDP dedicated to public expenditures has increased from 27 to 47 percent from 1960 to 2001 (see Castles (2006), p. 15). At the same time, the ratio of social expenditures to GDP increased from 10 to over 22 percent (Adema and Ladaique (2005)). Hence, it follows that the share of public core expenditures has increased only from 18 to 23 percent (Castles (2006)).\(^1\) To a very large amount, the expansion of public expenditures is caused by rising social expenditures that are part of redistributive policies.\(^2\)

While this picture shows a trend over time, theories on redistribution focus on different aspects like income inequality, demographic changes and voting behavior. Hence, the remainder of the paper deals with models of redistribution in the political process and emphasizes the role of voters. Therefore, aspects of inequality in the context of a Meltzer-Richard type model are analyzed in the next chapter. Section three presents extensions of the basic model. Here, the directions of redistribution as well as strategic voting are part of the analysis. In the fourth section, a theoretical model of the political process is presented that extends the analysis so far as it incorporates first, public goods as an additional expenditure category and second, lifts the restriction of lump-sum transfers. The paper ends with a conclusion.

\(^1\) Core expenditures are defined as total expenditures minus social expenditures.

\(^2\) The main increase has been established before 1990. Afterwards, there is no clear picture of the development of social expenditures across countries (Castles (2006)).
2 Voting, redistribution and income inequality

Redistribution of income is one of the most prominent tasks of governments. Most public activities are related to redistributive issues (Pommerehne and Kirchgässner (1991), p. 453). Among the first, Meltzer and Richard (1981) took a closer look at the determinants of redistributive politics.\textsuperscript{3} In their approach, they assume that redistribution of income is the only task of governments, thereby neglecting the supply of public goods. This simplification is useful when analyzing the dimension of the public sector. The relative size of government is then the share of income redistributed by the government. The share of government expenditures on GDP and hence the tax burden depend on utility maximizing individuals. Three assumptions are central: First, they neglect any effects of fiscal illusion. Second, they concentrate their analysis on redistribution and not on the provision of public goods and third, the expansion of the right to vote and the change in the income distribution of voters has led to an expansion in fringe benefits and therefore in redistribution.

There model rests on the assumption that the median voter is central for the decision about governmental politics. The size of government then depends on the relation of average income to the income of the median voter. Those voters with a lower income than the decisive voter prefer higher taxes and more redistribution while voters with a higher income aim at reducing taxes and redistribution. An increase in income inequality then leads to an increase in the average to median income ratio and results in an increasing size of government through redistributive politics (see Borcherding, Ferris and Garzoni (2004), p. 81).

In a general equilibrium model, prices, wages and tax rate are determined on the goods- and labor market or through the political process. Differences between individuals depend on the labor-leisure decision and consumption and thus are related to differences in the original endowment or to differences in productivity. Utility functions are strictly concave in consumption and leisure. Labor income is taxed and individuals receive a lump-sum transfer net of taxes. For low-productivity individuals, working time will be zero and their income depends only on governmental transfers. From the maximization problem it follows that the individual working time depends on productivity as well as tax rate and lump-sum transfer. The latter two factors also determine the lower productivity bound up to which individuals choose not to work. As the per capita income depends on the productivity level, tax rate and transfers, while

\textsuperscript{3} The model is often referred as Romer-Roberts-Meltzer-Richard model (RRMR) (also see Romer (1975) and Roberts (1977)).
at the same time the budget has to be balanced, fixing the tax rate determines the transfer level automatically.

The size of government then depends on the majority voting process. If the median voter is decisive, a higher preferred tax rate results in two reverse effects: First, the increase c. p. leads to higher revenues. Second, as the net-wage decreases the opportunity costs of leisure diminish. Hence, more and more individuals will choose the transfer as their only source of income. The decision of the median voter on the tax rate depends inversely on his own income and productivity. A median voter with high productivity will then choose a lower tax rate and vice versa (see Meltzer and Richard (1981), p. 921). Low income median voters benefit from increasing tax rates and public expenditures.

The position of the median voter within the productivity distribution is essential for the result. It may change due to electoral changes, i.e. changes in the ability of certain groups to participate in the elections, or due to enhancements in the welfare state. The more persons benefit from the public welfare programs, the more will they vote for a further expansion of redistributive social security systems. The decision to increase tax rates and to rely on more redistribution depends on the relation of average to median income. An increase of the average income in relation to the median income goes along with a higher taxation of earned income. Given a typical right-skewed income distribution, this means that in this case the median voter moves towards the left, resulting in a higher preference for transfers.

While the results of Meltzer and Richard go beyond those relating public expenditures solely to the development of GDP (see e.g. Peacock and Scott (2000) or Borcherding, Ferris and Garzoni (2004)), the approach cannot explain rising social expenditures in times after the introduction of universal suffrage. The reasons for such a process are anchored in the changing preferences of the population towards a broader coverage by the social security systems. Moreover, the tax-transfer relation and the income distribution changes in line with the demographic ageing. While a higher average age leads first to a higher income, average income declines with a relative increase of retired persons. An open question is further, whether the Meltzer-Richard effect still works when other forms of public expenditures, for instance expenditures on public goods, are taken into account.

A different approach to analyze redistribution due to public policy is provided by Peltzman (1980). In contrast to Meltzer and Richard who use a median voter model, he analyses majority voting in a representative democracy and its effects on redistribution and tax policy. In de-
tail, the distribution of income is at the core of the model. First, the distribution between the two groups, tax payers and transfer recipient, is important; second, also the distribution within the group of transfer recipients is of relevance. Again, public expenditures are solely used for redistribution purposes. The political process is modeled as a two-step democracy. First, a politically dominant redistribution program has to be found. Second, competition between politicians leads to converging platforms.

Peltzman analyses two groups of voters. On the one hand those who pay taxes and on the other hand those who receive benefits from the government. Whether an individual votes for a certain political program or not depends on his initial endowment as well as utility and costs of a redistributive program. If the income distribution between the two groups of voters is affected by exogenous shocks, the “between-group inequality” between financiers and beneficiaries as well the “within redistribution” changes. In the first case, Peltzman assumes that the income of the beneficiaries rises by one percent and that at the same time, the payers’ income decreases by one percent. This leads to the so called “Robin-Hood result”: Due to the rising income of the groups of beneficiaries, the political pressure for further redistribution diminishes. By rising market activities of this group with the group of tax payers, redistribution in the tax-transfer system is replaced by redistribution in private markets. In the second case (within redistribution), Peltzman assumes that the entire incomes of both groups remain unchanged. Instead, the income of the marginal beneficiary is reduced.\(^4\) Hence, inequality within the recipients group is reduced and it follows that this now more homogeneous group can push forward its political interests leading to higher public expenditures. Instead, if the group of recipients is very heterogeneous in income, it may be more difficult to enforce their interests and public expenditures will decline.

In contrast to Meltzer and Richard who propose that differences in income between median and average income lead to increasing public expenditures, Peltzman takes a closer look at the distribution of income between and within population subgroups. As income gaps become smaller, which means that levels of income converge, redistribution declines whereas equalization within the groups of beneficiaries strengthens their position in the political process, encourages redistribution and leads to higher expenditures. Both scenarios reveal that the changes in the inequality point in the opposite direction. If a higher degree of inequality in the population corresponds to a more homogeneous group of beneficiaries, the political task of

\(^4\) The marginal beneficiary is the person with the highest income who still receives public transfers.
redistributing income becomes more important. The political pressure aggravates and at the same time a better political feasibility results from a more homogeneous group of recipients. One major criticism is that Peltzman like Meltzer and Richard concentrates solely on redistribution as the only function of public expenditures. The possible trade-off between public goods and transfers is not analyzed.

3 Voting on redistribution: extensions

Borck (2007) surveys various models of voting in the case of redistribution.\(^5\) In his framework, parties, the political system and interest groups influence the policy outcome. Parties’ influence depends on preferences of politicians, party competition as well as ideology. He gives evidence for a “partisan theory” of political competition which assumes that left-wing parties represent lower income groups while right-wing parties attract high income voters. Moreover, in a comparative political economy with proportional representation, governments are typically larger and more money is spent on welfare programs compared to majority voting. In addition, interest groups may use information and political pressure to reach their redistribution goals. He bases his analysis on a Romer-Roberts-Meltzer-Richard type model with a linear tax schedule comparable to that in section 2. The result that redistributive taxation increases if inequality, measured by the ratio of median to mean income, increases can be extended to situations with broader tax schedules.

In addition, he distinguishes between redistribution from rich to poor and redistribution from poor to rich. In the first case, political participation is relevant for the outcome of the political process. If the participation is related to income, redistribution will be lower than in the basic model because first, not everyone decides to vote and second, richer voters prefer lower taxes than poorer voters. In the end, the decisive voter now has income that is higher than the median of the total population. Another strand of literature deals with expectations about future social status. If individuals expect to be richer in future, they will not vote for redistribution if the political situation is stable (upward mobility). Hence, this results in limited redistribution and inequality does not generally lead to higher transfers. A last category relevant for the rich-to-poor redistribution is based on social preferences. If individuals do not solely take their own utility or welfare into account but instead care about welfare of others, redistribution might be higher than in the basic model. Two directions are possible. First, with strictly selfish voters, redistribution increases independently of the distribution of income. Second, in

\(^5\) See Borck (2007) for a full survey of the literature related to the topic of redistribution and voting.
addition to Meltzer and Richard, not only the ratio of median to mean income is important but also the variance of the distribution matters. Considering the poor-to-rich redistribution, Borck analyses the impact of public provision of private goods like health care, the effects of education and insurance benefits. First, given that the government provides private goods, high income groups may prefer this kind of spending dependent on their income elasticity of demand. Second, as upper classes benefit from public higher education, one might observe redistribution to middle and high-income classes. Third, state insurance against the risk of illness and unemployment leads to declining benefits with increasing wage inequality if the relative risk aversion exceeds 1.

In a recent paper, Borck (2009) argues that voting behavior with respect to redistribution in case of tax evasion may result in several possible outcomes. The underlying tax schedule is assumed to be linear and the revenues are redistributed by a lump sum transfer. Individuals try to evade taxes but face a penalty if their behavior is detected. In such a scenario, the typical redistribution result where there is redistribution from high to middle or poor income groups is one possible outcome. Second, redistribution may be limited by the threat of evasion, i.e. high income groups seek to evade taxes. Then, total revenue available for redistribution purposes declines. Third, redistribution in favor of rich and poor individuals is possible. Here, it is the middle class who has to bear the tax burden.

All results mentioned so far are based on the assumption that redistribution is the only governmental task or that spending is used to provide private goods instead. Besides that, the provision of public goods is the most prominent expenditure category in all industrialized countries. In this line, Calabrese (2007) analyses majority voting when state expenditures are used for the provision of public goods and redistribution. He uses a linear tax schedule and further assumes that expenditure policies affect the labor-leisure decision of the individuals. Individuals differ with respect to their labor productivity and government policy encompasses the provision of public goods, taxation and redistribution by a lump sum grant assuming that the budget is balanced. If the median voter is decisive, it follows that majority voting forms a stable equilibrium if all individuals choose to work. Instead, if some individuals do not work and instead only have income from redistribution then majority voting is not stable.

4 The trade-off between public goods and redistribution through public transfers

In a more recent approach, Schneider (2009) discusses the interaction of providing public goods and social transfers when two types of voters, employees and transfer recipients, decide
about the future political program.\textsuperscript{6} The model incorporates public transfers to those in need of public assistance, which means that every person eligible for this transfer will receive payments from the government.\textsuperscript{7} Voters have the opportunity to participate in elections and to become a member of a political party. The first decision depends on the costs and benefits of voting and hence on individual income. Party membership depends on utility gains and on the costs of being a member of a party (direct costs and opportunity costs of time). Political parties are platforms for individuals with a common political ideology (Downs (1957)).

The dependency between expenditures on public goods and social transfers can be seen as the result of the decisions in the political process. Individual participation in this process is possible by deciding about a party membership as well as participation in elections. Let $N$ be the number of working individuals who all supply inelastically one unit of labor. The number of transfer recipients $T$ is then $P-N$, given that the population $P$ is constant over time.\textsuperscript{8} The share of transfer recipients and employees on the whole population is therefore

$$\frac{T}{P} = \gamma, \quad \frac{N}{P} = (1-\gamma).$$

The first ratio can be described as dependency ratio $\gamma$.\textsuperscript{9} Transfer payments depend on two factors. First, on an average transfer $b^i_t$ that is determined by the government or by the political program of party $j$, where index $i$ indicates the time period.\textsuperscript{10} Second, there exists an individual transfer claim $\varepsilon_i$.\textsuperscript{11} Through the latter component, the deviation of the individual from the average transfer is determined. In detail, the individual claims may depend on the labor productivity in earlier periods or the length of the working period. In addition, the claims depend on governmental regulation of the transfer payments. In the model, the claims are assumed to be constant over time. If the transfer claim equals one on average, an average transfer recipient will receive exactly the mean transfer determined by the political parties $b^i_t$.

\textsuperscript{6} The model is based on the analysis by Olters (2002) in which the voting behaviour and its impact on government expenditures for public goods is analysed.

\textsuperscript{7} Creedy and Moslehi (2007) investigate the relation between transfer expenditures and expenditures for public goods without a deeper view of the political process. They find that the relationship between median and average income as well as the tax rate influence the expenditure ratio.

\textsuperscript{8} By assuming a constant population, it is possible to concentrate the analysis on the process of an increasing ratio of people receiving transfers.

\textsuperscript{9} For the share of transfer recipients, it is assumed that it is always positive with $\gamma \in (0,1)$.

\textsuperscript{10} Any variables or parameters with superscript $j$ aim at the policy of a political party $j$.

\textsuperscript{11} Persson and Tabellini (2000) describe the different impacts of transfer mechanisms like pensions, unemployment assistance or regional transfers but restrict their analysis to lump-sum transfers only.
Equivalently, individual working income or individual wage rate depend on the labor productivity $\varphi_i$ of the individual. The wage rate is therefore the product of the average market wage rate in period $t$ and the individual productivity $\varphi_i > 0$. It is assumed that the average productivity of all employees is one, which means that a working individuals will get the market wage on average. Besides labor market income, people in the labor force will receive capital income $rk_{it-1}$ while the dependent population has no income from capital. In contrast to the income of the working part of the population, the transfer income remains untaxed.\(^{12}\)

Concerning consumption behavior, as a further simplification the marginal rate of consumption of beneficiaries is assumed to be equal to one. This implies that public transfers should help to the guarantee a certain consumption level. Moreover, from the assumption that transfer recipients do not possess income from capital markets it follows that they are not able to invest their savings.

An individual’s utility from voting depends on his status as employee or transfer recipient. While members of the first group rate their satisfaction with the actual policy according to the tax rate and the provision of a public good, the latter group does not pay taxes and therefore takes the public good and transfer payments into account.\(^{13}\) The party platform then influences the satisfaction through two parameters for each of the groups: for the working population, the tax rate $\tau_j$ and the expenditures for the public good $G'_j$ and for the transfer recipients in addition to $G'_j$, the transfer level $b'_j$. Hence, one can divide the population in those who vote $(P^v = N^v + T^v)$ and those who abstain $(P^a = N^a + T^a)$.\(^{14}\) For the outcome of the election, we simply assume that a platform, which receives more than half of the votes, will win. The decision to become a member of a political party can be compared to the decision to vote and depends on the influence of political platforms on individual utility and political interests. An individual will join a party that resembles his own preferences most. He will only join if the difference in utility from competing platforms is higher than the costs of being member of a party. The cost may compass membership fees as well as opportunity costs of time. Due to the fact that membership depends on long-term beliefs and is not a temporary decision, membership costs are higher than voting costs.

\(^{12}\) This means that here, a situation without any ex-post taxation of pension is analyzed.

\(^{13}\) In this case, the idea of upward mobility is not taken into account.

\(^{14}\) If platforms only differ with respect to tax rate and expenditures for public goods, the voting decision of a transfer recipient depends only on the public good. Hence, platforms influence utilities to a different extent and may result into differences in voting behavior.
The objective function of a party consists of consumption aspects of the members, the supply of the public good and public transfers. The latter two factors have distinct effects: First, they enhance the consumption possibilities of those not in the labor force and second, social transfers follow a socio-political justification and can be seen as a governmental task. The objective function of a party \( j \) at time \( t \) depends on three components: the median consumption of a party member, the expenditures for providing the public good \( G \) and the expenditures for social transfers:

\[
\Gamma = \ln \left( P^{-1} \beta + (1-\gamma) \beta^N \left( 1 - \tau'_i \right) \left( \Omega^w_{ij} w_i + r_i \Omega^k_{ij} \right) + \gamma b'_i \omega^T_{ij} \right) + \lambda \ln \left( G_{ij} \right) + \delta \ln \left( b'_i P \right).
\]

The first term on the right side of equation (1.2) is the logarithm of the median consumption of a party member. As a simplification it is assumed that the ratio of employees to transfer recipients is the same for all parties and corresponds to the ratio in the population. The median consumption level consists of three components: first, average autonomous consumption, second, median consumption of a working individual and third, median consumption of a transfer recipient. The latter two terms are weighted with the population share of the relevant group.

For the working individuals, the median consumption depends on the average marginal rate of consumption \( \beta^N \) and on the median income. This income is related to wage and interest rate and the median of the working productivity \( (\Omega^w) \) and the median of the capital stock \( (\Omega^k) \) at the end of the last period. Transfer recipients dispose of an income that is equal to the median consumption if their marginal rate of consumption is one. The median income consists of the average transfer \( b'_i \), multiplied with the transfer claim of the median party member \( (\omega^T_{ij}) \).

\[
\Omega^w_{ij} = \text{med}_{m_{ij}=1} \left( \varphi_{m_{ij}} \right) \quad \text{and} \quad \Omega^k_{ij} = \text{med}_{m_{ij}=1} \left( k_{m_{ij}=1} \right),
\]

\[
\omega^T_{ij} = \text{med}_{s_{ij}=1} \left( \xi_{s_{ij}} \right).
\]

Here, \( M_{ij} \) is the number of party members that are employed while \( S_{ij} \) is the number of non-working members.\(^{15}\)

\(^{15}\) For \( \omega^T_{ij} \) it follows that the median claim of the party members and therefore the median transfer can exceed the average transfer as well as fall below.
The logarithm expenditures for the public good as the second term of equation (1.2) are weighted with the parameter $\lambda$ that shows the valuation of the public good in form of exogenous, cultural of traditional factors. Considering the public expenditures in total, there is a trade-off between those expenditures for providing the public good and those for social transfers. The logarithm of total transfer payments is weighted with the valuation $\delta$. It is obvious from (1.2) that total transfer expenditures depend on the share of transfer recipients $\gamma$ among the party members. The weighting factors $\lambda$ and $\delta$ show the relative importance of the particular expenditure category. Both parameters might depend on the income and wealth distribution in the population or party. Moreover, a negative relation between the weights and the income situation can be expected, which means that an increasing median income lowers the valuation of both, expenditures for the public good and for social transfers.

Parties plan a program about the expenditures for the provision of public goods $G$, the average transfer payment $b$ and the tax rate $\tau$. Therefore, they maximize their objective function (1.2) using a simplification of the median income for the working population and the public budget as constraints:

$$\Omega_{j,t} = \Omega^w_{j,t} + \tau_j \Omega^k_{j,t}. \quad (1.3)$$

The complete maximization problem can then be written as:

$$\max_{\tau,G,b} \Gamma_{_j} = \ln \left( P_j^{-1} \beta^w + (1 - \gamma) \beta^N \left( 1 - \tau_j \right) \left( \Omega_{j,t} \right) + \gamma b_j^i \omega_j^T \right)$$

$$+ \lambda \ln \left( G_j^i \right) + \delta \ln \left( b_j^i \gamma P \right) \quad (1.4)$$

$$\text{s.t.} \quad G_j^i + b_j^i \gamma P = \tau_j^i Y_i.$$

Rearranging the equation for the public budget and substituting for the tax rate simplifies the problem to one where the party decides about the expenditures on public goods and transfers. The tax rate results as a residual. The simplified maximization problem is then:

$$\max_{G,b} \Gamma_{_j} = \ln \left( P_j^{-1} \beta^w + (1 - \gamma) \beta^N \left( Y_i - G_j^i - b_j^i \gamma P \right) \left( \Omega_{j,t} \right) + \gamma b_j^i \omega_j^T \right)$$

$$+ \lambda \ln \left( G_j^i \right) + \delta \ln \left( b_j^i \gamma P \right). \quad (1.5)$$
The objective function now depends only on the decision variables \( G \) and \( b \). Moreover, it is obvious that the share of transfer recipients \( \gamma \) is crucial for the solution to the problem.\(^{16}\) Partial derivation of the objective function with respect to \( G \) and \( b \) yields after some calculation to the following final equations of the optimal expenditures for public goods and the optimal transfer. The optimal level of expenditures for public goods is then:

\[
G_t^{**} = \frac{\lambda}{1 + \lambda + \delta} \cdot Y_t \left[ \frac{\beta^\nu P \Omega_{jt}}{(1 - \gamma)\beta^\nu} + 1 \right]. \tag{1.6}
\]

\[
b_t^{**} = \frac{\delta}{1 + \lambda + \delta} \cdot \frac{\beta^\nu Y_t P^{-1} + (1 - \gamma)\beta^\nu \Omega_{jt} Y_t}{(1 - \gamma)\beta^\nu \gamma P \Omega_{jt} - \gamma \omega_{jt} Y_t}. \tag{1.7}
\]

To begin with the expenditures for public goods, their level depends on the GDP, the median income of employed party members and the share of employees in the population \((1 - \gamma)P\). Moreover, valuation of public goods and transfer payments, autonomous consumption as well as the marginal propensity to consume influence the optimal level of \( G \). It is worth mentioning that the median transfer claim has no impact on the expenditures.

Regarding the different influence factors in detail, the ratio of party preferences (valuations) is smaller than one. The term in square brackets is the relation of autonomous consumption and gross consumption possibilities of employed party members. For small values of \( \beta^\nu \) the proportion converges to zero and the whole bracket term to one. It follows that the expenditures for public goods are solely determined by the party preferences for public goods and transfers and the GDP. The resulting expenditures are lower than the GDP because of the balanced budget constraint.

This implies that a higher GPD goes along with a higher expenditure level because a given tax rate results in higher revenues independent of the different categories of usage. This result can be interpreted as a confirmation of the hypothesis postulated by Wagner (see e.g. Peacock (2006) or Peacock and Scott (2000)) about the absolute growth of public expenditures. Dividing the equation through \( Y_t \) gives the share of expenditures for public goods on the GDP. This share decreases with a higher median income of employed party members \( \Omega_{jt} \). This means

\(^{16}\) In addition, even if we first assume a stable population \( P \), an interesting question arises not only from shifts within the population composition but also from a changing population size. If one considers both effects, it is possible that through a higher \( \gamma \) the absolute number of transfer recipients increases even if \( P \) is decreasing.
that the willingness to spend money on public goods and to finance the expenditures through paying taxes is lower for rich parties than for poorer ones. The reason behind this is that ‘richer parties’ have a higher share of tax payers among their members. Increases in the population size result in a lower expenditure share. If public goods are non-rival in consumption and accessible freely, additional users can consume them with marginal costs of zero. In addition, the increasing number of transfer recipients leads to higher expenditures. This group only has advantages if the level is extended and does not bear the financial consequences through higher taxes. Consequently, a rise in the share of employees \((1-\gamma)\) leads to lower expenditures.

Concerning the optimal transfer, the denominator of the second quotient on the right has to be positive for a non-negative transfer. In addition to the variables and parameters that influence the expenditure level for public goods, also the median claim is of importance for the optimal average transfer. The transfer depends positively on the valuation of public transfer payments \((\delta)\) and negatively on the preferences for the public good \((\lambda)\).

It is obvious that if the median transfer claim \(\omega\) raises this increase results in a higher average transfer. The increased claim reflects the higher weight of transfer recipients with respect to the median consumption in the party’s objective function. An increase in \(\omega\) raises c.p. the median income from transfers that is used for consumption. Given an unchanged income of a median employee the transfer recipients gain from this by a higher political weight, a result comparable with Peltzman’s “within distribution effect”. It follows that this weight is used to achieve a higher average transfer.

The fundamental difference between working population and recipients of public transfers with respect to public services is that the latter group does not contribute directly to public revenues. There might be only an indirect effect if the transfer payment is related to the net-working income. The burden of public revenues hence rests on the shoulders of the working part of the population. Therefore, their higher median income has a negative effect on the average transfer.

The rationale for the declining average transfers can be seen as a combination of this higher weight and the public revenue system that solely aims at taxing the working part. These results show the differences between rightist and leftist governments. For the latter, members have lower incomes on average, which result in an expansion of public expenditures to the debit of the non-party members. These expenditures may focus on social transfers while a
rightist government shows a higher interest for lowering the tax rate. Given the balanced budget rule, this leads to a cut in public expenditures.

If one takes the GDP of a state as a measure of its welfare position, one can evaluate that an increase in $Y$ during the business cycle leads to a higher average transfer:\textsuperscript{17} A first effect is that through a higher $Y_t$ governments yield higher revenues. These rise in revenues can be used either for the provision of public goods or to improve the economic situation of the transfer recipients. The detailed segmentation of extra revenues depends on the political preferences for public goods ($\lambda$) and transfers ($\delta$).

The effects of a higher share of transfer are ambiguous. First, for small values of $\gamma$ ($< 0.5$) a negative effect of the ratio of recipients on the average transfer is possible. For a positive transfer, the following condition must hold:

\[
\frac{\gamma^2}{(1-\gamma)^2} \geq 1 - \frac{\beta^\gamma}{\beta^\gamma} \Omega \mu P, \quad (1.8)
\]

The left-hand side is positive by definition. The second term on the right is the ratio of marginal propensity to consume of an employed individual and autonomous consumption, multiplied with the median income of an employed party member and the population size. The product of the latter two factors can be interpreted as an approximation of the national income. Together with the marginal propensity to consume this gives the maximum consumption that can be financed by the gross income of a society. As long as this consumption level exceeds the autonomous consumption, the ratio is larger than one and the right hand side negative for all values of $\gamma$ in the interval $\gamma \in (0, 1)$. It follows that the effect of a higher recipient ratio on the average transfer is positive.

Besides changes in the composition of the population, an absolute rise in the population size is relevant for public transfers. The total effect of an increase in $P$ on the transfer level is negative. If public revenues and expenditures for public goods remain constant, an increase of the number of potential recipients by $\gamma \Delta P$ leads to a reduction of the average transfer payment. A more realistic scenario is to look at a decreasing population size. This effect is likely for industrialized countries like Germany, Japan or Italy among others (see Arnould (2007) or Tepe

\textsuperscript{17} While the analysis at hand is based on symmetric effects, i.e. that transfers decline with a lower GDP, social transfers often increase also in times of an economic downturn.
and Vanhuysse (2009)). In combination with a changing composition, this leads to an approximation of the future demographic effects on public transfers. This is the case, if the life expectancy increases and a decrease in fertility are observed simultaneously. In the literature, this effect is named as double aging (cf. Börsch-Supan (2000)). For the presented model, such a scenario leads to a decrease of the population size $P$ and an increase in the ratio of transfer recipients $\gamma$, e.g. through a higher ratio of retirees to the working population (given a constant age of retirement). The changes in both parameters ($P \downarrow$ and $\gamma \uparrow$) have the same effect on the average transfer. The resulting transfer increase rests on the assumption that the gross income is constant over time. If instead the changes in the population go along with a potential reduction in the labor force, the growth of the gross income will slow down.\textsuperscript{18} This leads c. p. to decreasing tax revenues. In total, the positive effect of the demographic change on public transfers is outweighed by the limitation of the public budget.

Last, the optimal tax rate is equal to the optimal ratio of public expenditures to GDP. Compared to the approaches of Peltzman (1980) and Meltzer and Richard (1981), the relative growth of public expenditures depends on the supply of public goods as well as on public redistribution in the presented model. This raises the question in how far both expenditure categories follow competing purposes. In other words: do higher social transfers lead to decreasing expenditures for public goods or is the increase in social expenditures equal to an increase in total expenditures? More relevant for public policy is the question about the effects of changes in the composition of the population. A shrinking population with a higher share of transfer recipients leads to higher expenditures. For the government the problem is to decide which forms of expenditures to finance in a world with a smaller labor force and increasing public debt. One solution may be to aim at higher contributions of transfer recipients, esp. for retirees.

5 Summary
Public decisions about scope and magnitude of redistribution have been analyzed for a long time. First approaches concentrated on aspects of income inequality. In the RRMR model, differences between the income position of the median and average voter determine taxation and hence public transfers. In addition, Peltzman views inequality between income groups and within the group of beneficiaries as a source of redistribution. Newer approaches have a

\textsuperscript{18} Such an effect is assumed by the analysis of the Federal Statistical Office (Statistisches Bundesamt (2006)) or Institut der deutschen Wirtschaft Köln (2004).
broader look at redistribution. They integrate aspects of the political process, i.e. whether governments are leftist or rightist parties, or strategic voting behavior in case of an expected income increase. The latter is referred to as the upward mobility hypothesis. Moreover, the typical rich-to-poor redistribution depends on the possibility to evade taxes. If tax payers are effective in doing so, the budget available for redistribution declines. Further, if the middle class shoulders the tax burden as consequence of tax evasion of the rich, poor as well as rich groups benefit from redistribution. While all these approaches concentrate on transfers as the only form of public expenditures, the inclusion of the provision of public goods leads to possible instabilities in majority voting if some individuals decide not to work but instead benefit from transfers as their only source of income.

If the state of an individual as transfer recipient is exogenously given, the interaction of political parties and voters helps to analyze the development of public expenditures with redistribution. In the center of interest are the interactions of expenditures for public goods and social transfers and the impact of the demographic change. Based on the median voter theorem, public expenditures are positively related to output and employment but are negatively affected by the party’s ideology. Those parties with a higher median wage and capital income of their members tend to reduce expenditures on public goods whereas parties with poorer members (or more members that already retired or receive other forms of public benefits) favor higher expenditure. Social expenditures are modeled by dividing the population in an active and an inactive part. The impact of political programs on both groups is diverse: the active population has an advantage from the provision of public goods but has to finance all kinds of expenditures through their tax payments. The inactive part of the population gets a public transfer net of taxes and can consume the public good as well. The parties’ programs reflect the trade-off between both parts of the population. For the active part, increasing expenditures for the public good and social transfers go along with higher tax payments while inactive members do not bear any fiscal burden.

For future expenditure policies, the combination of the factors demography and transfer recipients is of interest. If like in many industrial countries the population size is decreasing over time and contemporaneously, the number of transfer recipients is increasing, the changing formation of the population may lead to higher transfer payments. Those payments have to be financed by a decreasing potential working population. Moreover, if this results in a slower growth of the GDP, tax revenues per capita may decrease c.p. (cf. Bach et al. (2002) und In-
stitut der deutschen Wirtschaft Köln (2004)). Hence, there is a trade-off between a political majority for increasing social benefits and a diminishing financial basis. In an aging society, the high consumption level has to be financed by fewer employees (cf. Börsch-Supan (2001), p. 205).

At last, it seems that expenditures for public goods are negatively influenced by expenditures for social security. In an ageing society, especially the level of transfer payments, the number of recipients, and the time during which benefits can be received have an impact on social transfers. In many industrialized countries, the broadening of the welfare state and of social security systems direct public expenditures away from what can be described as core expenditures.

References


19 Shelton (2008) shows that a lump-sum transfer and the tax rate are positively correlated with an increasing old-age dependency ratio.


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