Abstract

Introduction

The rise of the welfare state throughout the industrialised countries in the middle of the twentieth century was justified by social security and an improvement of living standards. Since then, government spending has continued to rise. Even in the 80’s and 90’s when a renewed conservatism unsuccessfully tried to limit social spending. Increasing government spending and redistribution seems to be an unstoppable tide. But will this continue? The likely answer is no!

Instead it is relevant to ask which factors will set a limits to social spending.

With improved living standards, comes increasing life expediency and thus more people relying on the generosity of government spending without participant in the production in the economy.

Lindert has famously argued that demography (the ratio of people over 65 to people in the working age) will set the limit to social spending – while controlling for rising deadweight costs due to higher taxation to finance increasing redistribution. Lindert focus was on demography versus deadweight costs from taxation thus excluding another very important factor limiting social spending. That factor is informality.

The aim of this paper is to shed light on the subject of limits to social spending by expanding the framework developed by Lindert to also including informality in the economy.

1. What effects social spending?

Social spending can be measured in numerous ways. In this paper, spending (measured in USD in constant 2005-prices) per capita will be used and we differ between social spending and non-social spending. Education will be included independently. Social spending will be divided into the subcategories pensions, health, welfare and unemployment. Non-social spending is defined as the residual between all spending and the sum of social spending and education. In order to compare across countries, the different types of spending are divided with the total population[[1]](#footnote-1) thus creating variables containing spending pr. capita.

To investigate the limit of social spending, the following competing theories are explained and the validity is explored: deadweight cost of taxation, informality in the economy and demography.

* 1. Burden of taxation: there ain’t no such thing a free lunch.

In economic theory, it is a general assumption that taxes are distortionary, and that taxes and transfers reduces productivity. It is straight forward to argue, that the limits to social spending is set by rising marginal deadweight costs of the redistributive welfare state: increasing taxation needed to finance the redistributive welfare state will choke of either the ability or the willingness to raise taxes and spending. Since the days of Adam Smith, warnings have been made, that costs rise on two fronts and distort labour-leisure choices both for the taxes and the subsidized – the welfare state creates its own limit.

It is not straightforward to measure the degree of distortion due to taxes and transfers. However, heavy distortionary due to taxes and transfers are ought to be visible through a negative effect on income.

* 1. Effect of informality

Taxes affects labour-leisure choices, but it also stimulates labour supply in the informal economy, here defined as the untaxed part of the economy. It has been argued that the main cause to the increase of the informal economy is to the rise of taxation and social security (Williams, Schneider, 2013). The argument is straight forward: as taxes are distortionary, the higher the tax rates, the more distortion and the bigger a shadow economy.

Others have argued that firms are willing to be taxed at reasonable rates, but unwilling to put up with over-regulation and corruption, and thus explaining the rise of the informal economy and decline of government revenue by poorly managed tax systems (Friedman, E. et al, 2000, La Porta et al, 1999).

No matter the reason, a rise in the share of the informal economy will by all likelihood decrease government revenue, especially the part of government revenue generated by income and profit taxation. This might result in a vicious circle where tax rates on the formal economy are increased to keep funding the public provision of goods – often combined with a decline in quality goods provided by the public sector and poor administration – with the consequence of additional growth in the informal economy (Enste, Schneider, 2000).

Following this line of argument is straightforward to argue that, informality will affect all government spending negatively. A high degree of informality might make it difficult to obtain a high level of government spending, as the share of people paying taxes and thus funding the welfare state is low.

* 1. Demography

An important factor for society’s priorities and government expenditure are the age distribution of the population. As the population grow older, the politics of social spending shift in favour of the policies catering to the needs of the elderly: health, pensions and welfare programs. This development has been there since life expectancy began to accelerate in the late nineteenth century (Lindert, 2004). The effects from an ageing population on social spending are twofold: when numbers of entitle recipient increase, the share of GDP spent on their support will rise even with unchanged policies. However, observing historical numbers shows that between the 1880 and the 1930 transfer per old person has increased. (Lindert, 2004). This gives reason to believe that an older population tips political and social sentiment in favour of granting security and income. The older the population (or median voter), the more the concern of the elderly will mobilize the old and middling age through the political system. However, as retirees becomes to numerous social spending catering to this group becomes very costly. Pensions are generally still financed through a pay-as-you-system and protest from the working adults would stop the rise of pension benefits and thus the generosity of the programs will start to decrease. This implies, that the effect from the age distribution of the population could have non-linear effect on social spending.

1. Setting up the models

2.1. Variable selection

The two competing models, deadweight costs and age distribution, are well-developed. Both explanatory and control variables are chosen based on past literature and only a brief introduction to the setup is necessary. How to include a measure of informality in the analysis might require a short discussion.

*Deadweight-cost* theories predict as mentioned that spending on various social programs are expected to have a negative effect on income in the economy, but government spending on investment in human capital (education) and infrastructure (non-social spending) are on the other hand likely to have a positive effect on income. Different types of government spending should then enter separately in the model. Income will be measured as the natural logarithm to GDP pr. capita measured in USD dollar in 2005 prices.

When investigating the theory of rising deadweight costs as a limit to social spending, it is essential to control for other factors effecting income-level. These factors include initial income-level, globalization, investment in real (and human capital) and whether or not national institutions are negotiating pay, employment and fiscal policies among organized representatives of labour, business and government.

Looking at the effect from age-distribution on social spending, it is obvious that various variables for the development of the demography should enter in the analysis: the ratio of young people (0-19), school\_age (5-19), young\_adult (20-39) and old (65 +) to people in the working age (20-64). As mentioned earlier, the relationship between demography and social spending might as well be non-linear, and the squared term will also enter in the analysis.

Choosing control variables are based on literature that have argued that income level, income distribution and a number of political factors also affects social spending. It is often found, that higher average income raises both the level of government spending and the share of national income (Lindert, 1996). There is not consensus to why these “development” effects arise. Some argues positively that high income allows for social insurance, whereas other pessimistically argues that development and high income creates the need for insurance. No matter the reason, it is predicted that both total and share of government spending should rise with average income. Another interesting income-variable when trying to predict social spending is income distribution**,** especially the significance of the median-voter. The central question here is which group the median voter sympathizes with: the poor or the rich? The closer to the poor, the median voter feel, the more the median voter will favour redistribution and egalitarian spending. On other hand, if the median voter feels closer to the rich they will vote against taxation. (Meltzer and Richard, 1981 cited in Lindert, 1994).

Turning to political factors, the most relevant electoral variables for the period of interest are voter turnout and executive turnover. Both these variable might have a positive effect on redistribution and social spending. As voter turnout generally are more elastic among lower income voters, a high turnout tends to favour redistribution. Executive turnover is thought to be a measure of political stability, and fast turnover may raise spending.

Additional to these variables, this paper extents control variables to also including labour force participation for males. This variable will be used throughout as a proxy variable, in order to measure the degree of informality in the economy. Earlier studies have used the difference between the official and actual labour force (cited in Williams, Schneider, 2013). The weakness of this method is that the difference in labour may have other causes (i.e. norms for whether or not women are participating on the labour market). Moreover, people can work both the formal and the informal economy. As males still are the primary breadwinner, only using male labour force participation might be a better indicator for the size of the informal economy.

This variable will only enter as a control variable when explaining social spending and not when investigating the effect of rising deadweight costs on the income growth.

Even though some has argued that a big informal sector might dampen economic growth, as there might be a negative relationship between informality and investment in public infrastructure (Loayza, 1996). These findings are widely discussed, as it builds on the assumption that public investment in infrastructure is necessary to develop production technology and the data set only contains Latin American countries with poor institutions (Schneider et al p. 13, 2000).

Controlling for the effect of these factors, the two competing theories can now be tested against each other to find the limit of social spending.

2.2. Data selection

The data set includes 34 OECD member states from the period from 1980 to 2011. This also includes 5 countries that used to be under Soviet control (Poland, Estonia, Slovak Republic, Slovenia and the Czech Republic). Data from these countries are unavailable for many variables before the beginning of the 90’s. Data from Chile, Israel, Mexico and Korea are also missing in the beginning of the period. This implies an unbalanced panel data set. The data is extracted from OECD.Stat when possible to ensure consistency in definitions, but supplemented by data from the World Bank and from Penn World data. Data sources and definitions are elaborated in the appendix.

2.3. Model selection

Working with a panel data set containing observations for each country and year, the error terms are likely to contain both international heteroscedasticity and serial correlation. To deal with serial correlation a 4-year average[[2]](#footnote-2) is calculated for all variables. As social spending will be effected by business cycles, averages over a time period removes some of these fluctuations. Thus, the data set contains 244 observations containing 4-year average of 34 countries rather than 934 observations containing annual observation for the same 34 countries.

Random effect is applied on the panel data to deal with international heterogeneity.

2.2.1. Random effects

This panel data set contains both a cross-sectional and a time dimension. For any economic analysis of the data, we cannot assume that the observations across countries are independently distributed across time. Any national propensity toward one social program or national tax moral that effects social spending in the 80’s will most likely also affect the social spending in the 90’s. Within the sample there are big differences across countries.

Denmark and Switzerland are two countries that looks very similar in terms of income, population size and age distribution, but varies greatly when looking at the level of social spending. This is a strong argument for using random effect, as it gives us reason to believe that national differences play an important role in determining social spending. A requirement for using random effect is that the country specific error terms should be uncorrelated with each explanatory factor (Wooldridge, chp. 14). This is a rather strict assumption and requires good control in the equation. That fact that, some variables might not be available, can lead to omitted variable bias. Another drawback to using random effect, is that the interpretation of the coefficients is tricky, as they include both within-country effects and between-country effects. In the case of time series cross sectional data represents the average effect of the explanatory variable on social spending when the explanatory variable changes across time and between country by one unit. (Princeton, pp)

An alternative approach is using a fixed effect estimator, which would allow to assess the net effect from the predictors on social spending. However, arguing that these country-specific really are uncorrelated with the explanatory variables, trying to remove these country specific effect would lead to inefficient estimators. (Wooldridge, chp. 14)

We can write our random effect model for each of the six types spending:

Where a\_i are the unobserved country specific error and u\_it are the error term. p = pensions, welfare, unemployment, education, non-social, health, all expenditure, social expenditure. i=country, t=time. x= explanatory variables briefly discussed above and presented in table 1.

The key assumption here is that the unobserved country specific effect a\_i is uncorrelated with all explanatory variable in all time periods:

The ideal random effects assumption includes all fixed effect assumptions plus the additional requirement that a\_i is independent of the explanatory variables in all periods. (Wooldridge, chp. 14, assumption). These assumptions are presented in the appendix???

Using the same line of argument, where national differences might be due differences in propensity toward one program, the model for the rising costs of social spending are:

2.2.2. Shortcomings

Looking at the equation (1)-(8) and (10) it is clear that we are implicitly assuming that income and social spending are chosen simultaneous (jointly determined). As argued earlier, the extension of the welfare state financed by higher taxation, is distortionary and has negative effect on income. On the other hand, richer countries tend to have more redistribution. This implies that social spending is correlated with the error term in equation (10) or/and that income is correlated with the error term in equation (1) - (8), which will lead to simultaneity bias. (direction) Thus, there are reasons to explore simultaneous relations between income level and social spending.

A drawback to panel data are cross-country dependency (i.e. correlation between countries)

1. Presentation of results

The results from the panel regression are presented in Table 1. In each row the effect from one independent variable on the types of spending are presented. These effects will be reviewed:

Income effects, summarized in the first two rows, shows up only faintly. Spending on welfare programs are the only program where the income effect is significant – and only on a 10 pct. significance level. This implies zero (or small positive) effect from higher living standard on the size of the welfare state in general.

The age distribution are reported in the next six rows.

“Given the relative high levels of spending reached since 1960, and the relative ease of forecasting future movements in the age distribution, we should give age variables a chance to show that their influence on social spending is not monotonic.”

Electoral variables not showing any significant effect on social spending. Only for total spending are the effect from voter turnout significance, but very small (and economic irrelevant effects).

3.1. Determinant of social spending

|  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| TABLE 1: | All gov't exp | | Nonsocial exp | | Social exp | | Pensions | | Welfare | | Unemployment | | Education | | Health | |
| VARIABLES | Coefficient | pval | Coefficient | pval | Coefficient | pval | Coefficient | pval | Coefficient | pval | Coefficient | pval | Coefficient | pval | Coefficient | pval |
|  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |
| ln(GDP/capita) | 0.898 | (0.139) | -4.431 | (0.320) | 5.875 | (0.190) | 0.570 | (0.391) | 4.711\* | (0.0708) | -0.715 | (0.811) | -1.510 | (0.323) | 0.577 | (0.357) |
| sqaured | 0.0749 | (0.374) | -0.0815 | (0.891) | 0.236 | (0.695) | -0.00327 | (0.972) | 0.422 | (0.215) | -0.214 | (0.587) | -0.343\* | (0.0808) | -0.0516 | (0.544) |
| Young adults (20-39) | -3.646 | (0.621) | 73.11 | (0.241) | -70.22 | (0.262) | 1.248 | (0.888) | -21.51 | (0.593) | -52.62\* | (0.0519) | -19.34\* | (0.0669) | -3.953 | (0.779) |
| squared | 2.354 | (0.756) | -83.81 | (0.209) | 79.61 | (0.237) | -0.860 | (0.926) | 25.13 | (0.554) | 58.57\*\* | (0.0394) | 19.26\* | (0.0873) | 3.018 | (0.836) |
| School age (5-19) | -1.201 | (0.369) | 0.656 | (0.930) | -2.524 | (0.746) | 2.230 | (0.201) | -9.084\*\* | (0.0195) | -3.322 | (0.543) | 1.148 | (0.442) | 7.116\*\*\* | (0.00169) |
| squared | 3.127\* | (0.0976) | 2.369 | (0.816) | 0.715 | (0.948) | -8.352\*\*\* | (0.00293) | 17.86\*\*\* | (0.00327) | 6.887 | (0.284) | -0.373 | (0.848) | -16.31\*\*\* | (0.000175) |
| Over 65’s | 8.848\*\* | (0.0214) | -68.65\* | (0.0741) | 73.39\* | (0.0603) | 15.53\*\* | (0.0222) | 34.62 | (0.280) | 34.00\*\* | (0.0445) | 12.12\* | (0.0995) | 4.982 | (0.565) |
| squared | -15.77\*\* | (0.0378) | 120.5\* | (0.0945) | -127.4\* | (0.0807) | -24.81\* | (0.0515) | -61.18 | (0.316) | -59.29\* | (0.0647) | -24.67\* | (0.0744) | -8.091 | (0.628) |
| Executive turnover | -0.00605 | (0.602) | -0.143 | (0.337) | 0.154 | (0.309) | -0.0108 | (0.245) | 0.0978 | (0.355) | 0.0575 | (0.259) | 0.00385 | (0.781) | -0.00939 | (0.295) |
| Voter turnout | 0.539\* | (0.0803) | 1.542 | (0.358) | -1.046 | (0.555) | -0.0867 | (0.792) | -0.822 | (0.306) | -0.482 | (0.697) | -0.435 | (0.180) | -0.390 | (0.189) |
| Inequality | -0.391\*\*\* | (0.00253) | 2.714\*\*\* | (2.50e-05) | -2.918\*\*\* | (2.08e-06) | -0.298\*\* | (0.0103) | -1.660\*\*\* | (1.87e-06) | -0.913\*\* | (0.0334) | -0.222 | (0.170) | -0.138 | (0.180) |
| Male labour force participation | 0.0893\*\*\* | (0.00160) | 0.0683 | (0.630) | 0.0239 | (0.881) | -0.0283 | (0.389) | 0.0220 | (0.778) | -0.0155 | (0.869) | 0.0269 | (0.445) | 0.0518\* | (0.0627) |
| - squared | -0.000482\*\*\* | (0.000553) | -0.000394 | (0.589) | -9.18e-05 | (0.910) | 0.000131 | (0.407) | -0.000143 | (0.721) | 0.000152 | (0.751) | -0.000178 | (0.388) | -0.000246\* | (0.0803) |
| Constant | -1.110 | (0.665) | -59.40\*\*\* | (5.45e-06) | 57.61\*\*\* | (1.24e-05) | 9.348\*\*\* | (0.00152) | 21.64\*\*\* | (0.00792) | 15.27\* | (0.0725) | -0.0915 | (0.980) | 7.832\*\* | (0.0151) |

3.2. Determinants of income level

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| TABLE 2 | EQ. 1 |  | EQ. 2 |  |
| VARIABLES | Coefficient | pval | Coefficient | pval |
|  |  |  |  |  |
| ln(GDP/cap), t-10 | 0.366\*\*\* | (8.77e-08) | 0.0788 | (0.237) |
| ln(real investment), t-1 | 0.0893 | (0.290) | 0.0758 | (0.360) |
| Open | -0.00521 | (0.636) | 0.00175 | (0.891) |
| Primary enrollment, t-10 | -0.000374 | (0.831) | -0.000754 | (0.629) |
| Secondary enrollment, t-10 | -0.00202 | (0.120) | 9.11e-05 | (0.905) |
| Teritary enrollment, t-10 | -0.00166\* | (0.0689) | -0.00157 | (0.101) |
| Young (0-19) / workage | -0.894\*\*\* | (3.76e-05) | -0.486\*\* | (0.0124) |
| Young adult (20-39) / workage | -0.511 | (0.325) | 0.0673 | (0.892) |
| Over 65 / workage | -0.507 | (0.286) | -0.215 | (0.642) |
| Health exp |  |  | 0.131 | (0.737) |
| squared |  |  | 0.0191 | (0.524) |
| Pension exp |  |  | -1.444\*\*\* | (7.58e-05) |
| squared |  |  | 0.0927\*\*\* | (0.000302) |
| Welfare exp |  |  | -0.111 | (0.336) |
| squared |  |  | 0.0102 | (0.336) |
| Unemployment exp |  |  | 0.106 | (0.620) |
| squared |  |  | -0.0189 | (0.355) |
| Nonsocial exp | -0.408 | (0.694) | 0.120 | (0.689) |
| squared | -0.00623 | (0.736) | 0.00325 | (0.564) |
| Educational exp | 0.621\*\*\* | (0.00602) | 0.0743 | (0.699) |
| squared | 0.0614 | (0.161) | -0.0197 | (0.598) |
| Social exp | -0.535 | (0.556) |  |  |
| squared | 0.00932 | (0.566) |  |  |
| Constant | 0.778 | (0.707) | 1.894 | (0.410) |
|  |  |  |  |  |
| Observations | 224 |  | 224 |  |
| Number of country\_num | 31 |  | 31 |  |
| Robust pval in parentheses |  |  |  |  |
| \*\*\* p<0.01, \*\* p<0.05, \* p<0.1 |  |  |  |  |

1. Discussion, comparing to other literature

Key to the free lunch: bigger welfare states choses less distortionary tax systems, ensures that young people don’t avoid training and work. Transfers to retirement and unemployment benefits ensure higher productivity in the active labour force (Lindert, 2004, p. 227)

Besides the total tax burden, the system that a government uses to collect tax have an effect on the deadweight costs. Countries with a high degree of re-distribution in general chooses a mix of taxes that are less distortionary, compared to countries with smaller welfare states, while also developing tools to ensure young adults do not avoid training and work. (Lindert, 2004).

As plausible as these ideas seems to be, they have failed to explain the great difference in size of the welfare state among industrialised countries.

* 1. Improving method of estimation

As mentioned, social spending and income are chosen simultaneous, but are ignored throughout this analysis. The appropriate way of dealing with simultaneity is through a simultaneous-equation model: in one equation spending is allowed to depend on income, and in another spending is allowed to effect income negatively. Thus, we treat social spending and income as endogenous variables and all other variables as exogenous variables. In this case we have six equations for spending and one for income, making the SEM rather complicated.

When using SEM we need to make sure that the model meets the rank condition, which states that “*the first equation in a two-equation simultaneous equations model is identified if, and only if, the second equation contains at least one exogenous variable (with a nonzero coefficient) that is excluded from the first equation”* (Wooldridge, p. 554). We the number of equations excess two, identification is not that straight forward and there are many subtle ways that identification can fail in complicated SEMs. As we have 7 equations, SEM rather complicated in this case. Thus, for simplicity we look solely at the sum of social spending, giving us the model:

Z is a vector containing the exogenous variables used in the panel regression and as Z\_1!=Z\_0 the rank condition is met for both equations, implying that both equations are identified. The equations can now be estimated by 2SLS, where instrument variables consist of the exogenous variables in Z\_0 or Z\_1, where the first stage entails GLS of ln(Y) on social spending and the second stage combines the resulting predicted values (the hat’s) and their squared terms with the other variables in a GLS. This approach deals with simultaneity, heteroscedasticity and serial correlation. (must be tested, chp. 15, Wooldrigde)

* 1. Comparing to other literature

1. Conclusion

References

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Appendix A: Data

Most of the data is extracted from OECD.Stat. This includes data on government expenditures, GDP, demography, income inequality, voter turnout, unemployment, taxation and labour force participation. Expenditures, tax revenue and GDP are measured in USD in 2005-prices.

As a measure for inequality the P90/P50 ratio is used. This is the ratio of the upper bound value of the ninth decile to the median income. An increase in the ratio will imply more distance between the median voter and the rich.

The variable of interest, social expenditures, are divided into the sub-categories health, welfare, unemployment and pensions. All categories include both benefits in cash and benefits in kind. Social expenditures are the sum of these expenditures, thus excluding spending on housing and education. Non-social expenditures are defined as the residual of total government spending. These expenditures are divided by population, also extracted from OECD.Stat, to obtain spending per capita.

Data on expenditures on education and number of student enrolled are extracted from the World Bank. Data on import, export and capital formation are extracted from Pen World Tables. The variable open is defined as sum of export and import as a share of GDP. Corporatism is a crude index developed by Bruno and Sachs [1985] and Schmitter [1989] of national institutions negotiating pay, employment and fiscal policies among organized representatives of labour, business and government. Executive turnover is measured as the number of changes in president/premiere minister over the last decade and The Archigos data set “A Data Base on Leaders” is used. The variables linc is the natural logarithm to GDP pr. capita.

Appendix B: Assumptions:

1. An alternative measure could be expenditure divided with the population in the target group if one wanted a stronger focus on how the specific program affects incentives of those being eligible for it. [↑](#footnote-ref-1)
2. Comparing to 3- or 5-year average, both significance level and coefficients rises with longer averages. 4-year average is chosen to ensure comparison to Lindert’ paper. [↑](#footnote-ref-2)