When institutions reciprocate -turning European welfare states around[1]

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The trends in European welfare states are reversed. From rising generosity and declining earnings differentials, the trends have changed to stagnating generosity and increasing inequalities in gross earnings. The shift is visible in most European countries, though to varying degree, and it happened before the financial turmoil in 2008. The turning point seems to have occurred in the late 1980s, mirroring a similar change that occurred ten years earlier in the US.

In this chapter we document the reversal. We are less interested in identifying the specific shocks that actually initiated the change. We offer instead an answer to the more important question why equality in gross earnings and welfare spending move in tandem in an egalitarian direction before the turning point, and in an inegalitarian direction after. When welfare spending and earnings equality tend to move together, any shock that is sufficiently strong can in fact reverse the trends. We claim that the co-movement between earnings equality and welfare spending is caused by institutional reciprocity.

Two institutions de facto reciprocate when each strengthens the effects of the other**.** For instance, two mutually complementary institutions, that can reduce or increase income inequalities,

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end up strengthening each other's impact either in an egalitarian or non-egalitarian direction as long as there is a positive feed-back between the two arrangements. In this way institutions can enhance each other's qualities.

In this chapter, that builds on Barth and Moene (2009), we emphasize the mutual complementarities between institutions in the labor market and in the political arena. While institutions in the labor market shape the earnings distribution that is decisive for the actual political preferences of the voters, the resulting social policies that the distribution of earnings leads to, affect the earnings distributions. We claim that wage equality enhances welfare spending and that welfare spending enhances wage equality.

What we denote the equality magnifying effect captures how a more equal earnings distribution fuel welfare generosity via political competition. What we denote the wage equalizing effect captures how a more generous welfare state can fuel increasing wage equality via empowerment of weak groups in the labor market. Reciprocity between institutions can be positive or negative, enhancing the impacts of exogenous stimuli. It might trigger a reversal of trends.

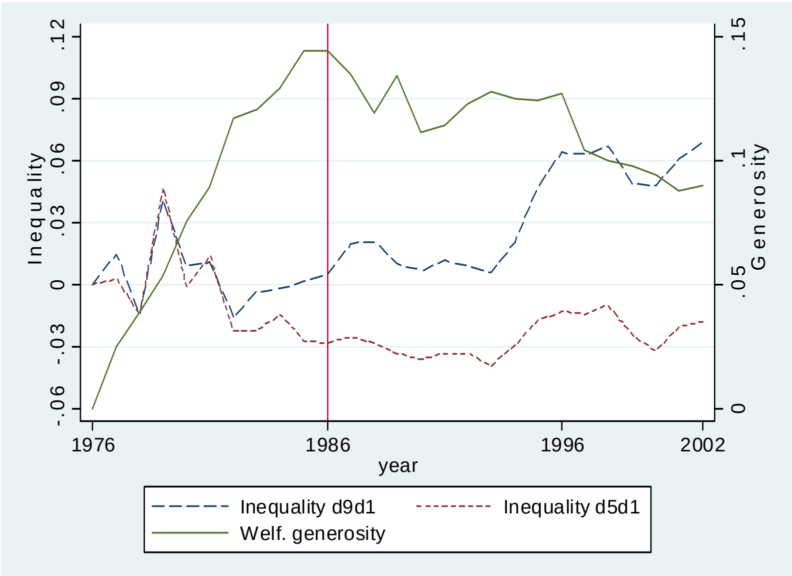
Up till the mid-1980s the average performance of Western European countries exhibited positive reciprocity. Since then, negative reciprocity seems to have taken over. Below we first illustrate empirically this reversal by the recent developments in European countries. Next we comment upon relevant literature and discuss some of the determinants of the processes of positive and negative reciprocity in more detail. We show how equality or inequality can multiply as the cumulative processes evolve, emphasizing the equality multiplier that we have estimated using the experiences from 18 countries over thirty years. We conclude with a few comments on the current crisis in European welfare states.

From positive to negative reciprocity in Europe

While, according to Figure 1, the generosity of welfare spending in European countries is first increasing and then declining, gross earnings inequality is first declining and then increasing. The exposition in Figure 1 is based on the experience of 13 European countries over twenty five years. It shows how earnings inequality in each year tends to be negatively associated with the new levels of welfare generosity for that year.

To measure the level of welfare generosity we use an index developed by Lyle Scruggs.[4] It captures the generosity of income support in the case of illness, unemployment and disability, and old age of each country year cell. The generosity index is constructed using the replacement ratio, coverage, entitlements and timing of different schemes. In Figure 1 we set the average level of welfare generosity equal to zero in 1976. Thus the figure shows the average accumulated growth rate in welfare generosity. Average growth rate is measured by the year dummies in a regression of the log of the overall welfare generosity index on year and country dummies. Growth in earnings inequality (the decile ratio of gross wages) is calculated and illustrated in the same way, using country and year dummies from 1976 to 2002. [5]

Figure 1. Welfare generosity and wage inequality 1976-2002. Average accumulated growth, 1976==0.



Note: Wage inequality is measured by the log of the ratio of the 9th decile to the 1st decile (d9d1) and d5d1 of gross earnings, taken from OECD Stat Extracts, ECHP and OECD Employment Outlook, 1996. Welfare generosity is measured by the log of the overall generosity index obtained from Comparative Welfare Entitlement Dataset developed by Lyle Scruggs. Countries included are AU, BE, DK, FN, FR, GE, IR, IT, NE, NO, SZ, SW, UK. The figure shows the coefficients for year dummies (1976=0) in separate regressions including country dummies and controls for data source.

The figure indicates that we first have a period of positive reciprocity from 1976 to 1986. This first period is characterized by a decline in average wage inequality and a rise in the generosity of European welfare states. The process is not smooth as the developments of the welfare generosity and

[4] University of Connecticut (Comparative Welfare Entitlement Dataset, http://sp.uconn.edu/~scruggs/wp.htm)

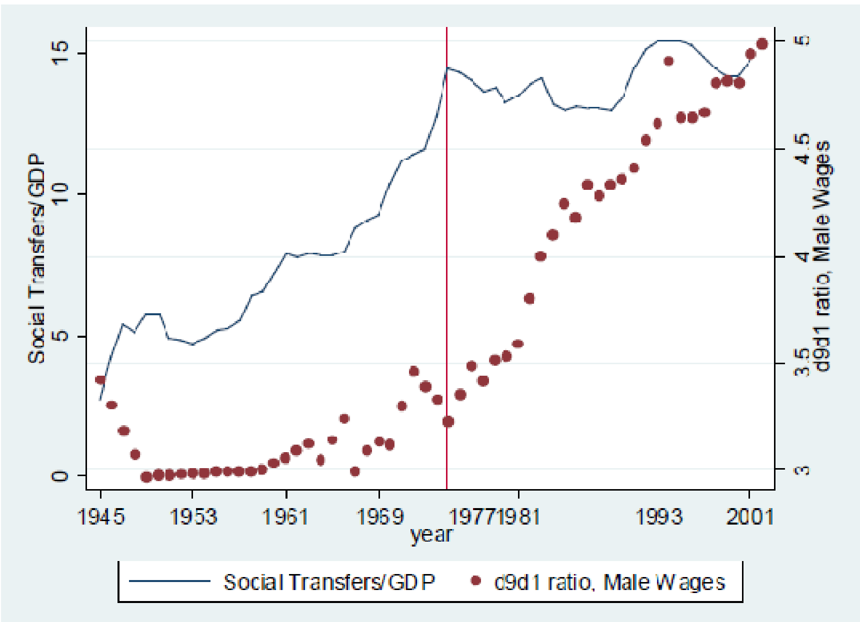
[5] Including dummies for annual or monthly versus weekly earnings, and for data set in some countryxyear cells that were supplemented with data from ECHP and earlier OECD sources.

wage inequality in each country, in addition to being affected by each other in the process of positive reciprocity, are affected by other systematic factors and random impulses.

The figure also indicates that we have a period of negative reciprocity from 1986 to 2002. This second period is characterized by an increase in average wage inequality across countries, to a large extent driven by increasing dispersion in the upper part of the distribution, but also by increased wage dispersion in the lower part of the distribution (d5d1) after 1993, and a stagnating or declining generosity of European welfare states. Again the non-monotonic developments in some of the time series must be explained by other factors and random impulses. Yet there is a clear pattern of negative reciprocity.

A similar pattern of first positive and then negative reciprocity can also be found in the development in the US as demonstrated in Barth and Moene (2009). The period after 1945 into the 1960's, was characterized by positive reciprocity. This era of "the great compression" as Goldin and Margo (1992) denote it, referring to the compression of the wage structure, was accompanied with high growth in social spending. Perhaps initiated by the oil crisis and the end of the Vietnam war the period after 1975 was characterized by negative reciprocity. It includes the attacks on the trade union rights and the era of welfare retrenchment of Ronald Reagan and was accompanied by steep growth in wage inequality (see Figure 2).

Figure 2. U.S welfare generosity and wage inequality 1945-2002.



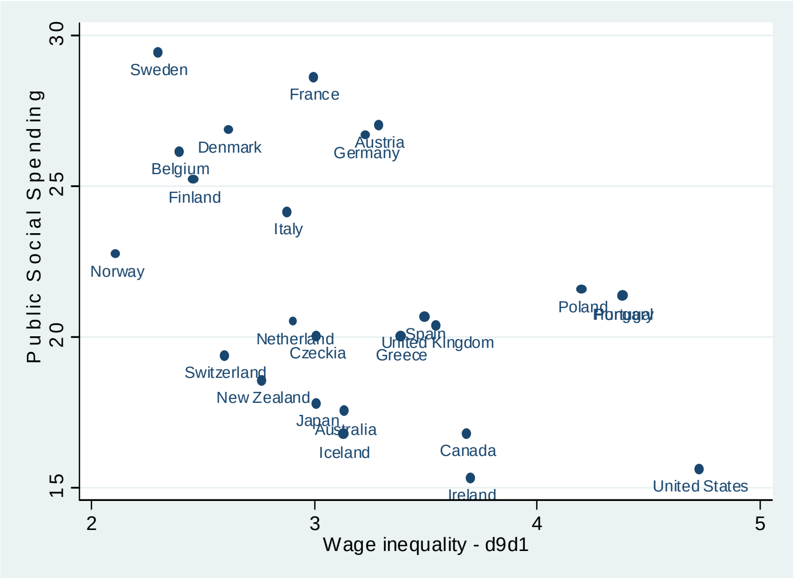
Source: Social Transfers 1945-1959, Historical Statistics of the United States, Millennial edition (includes Social insurance, public aid, health and medial programs, veterans programs, housing and other social welfare programs); 1960-2001 from the OECD Lindert-Allard Data Set (2009). d9d1 ratio, Male Wages from Goldin and Katz (2007) See Barth and Moene (2011:Figure 2) for details.

The pattern of change in Europe followed a similar pattern to that of US, but with a lag of almost a decade. Still the US had consistently higher levels of earnings inequality and lower levels of welfare generosity. It may be the case that the "Reagan revolution" got a quicker start in the US, simply because unions were weaker and earnings inequality was larger in the first place, whereas the shift in Europe took longer time to take hold because unions and the popular support of the welfare state were stronger at the outset, and cuts in the welfare state faced more opposition in the electorate.

Cross country pattern

Institutional reciprocity also shows up in the observed variations across countries. High levels of welfare spending accompany low levels of wage inequality and vice versa. An example of this pattern is shown in Figure 3, where we display the average level of public social spending per capita between 2000 and 2005 for 24 OECD countries against the average d9/d1 decile ratio of gross weekly wages between 2000 and 2007 from the same countries. We find a clear negative relationship between public spending and pre-tax wage inequality in the labor market just as the institutional reciprocity implies. Negative reciprocity implies that some countries end up in the south-east corner of Figure 3, while positive reciprocity implies that some countries end up in the north-west corner of the figure.

Figure 3. Public social spending and wage inequality. OECD countries 2000-2007



Note: Public social spending is measured as pct of GDP and obtained from OECD Social Expenditure Database (2000-05), and the decile ratio of gross earnings is obtained from OECD Stat Extracts (2000-07).

Europe since the 1980s

As the trends of European welfare states turned to negative reciprocity from the mid 1980s many countries have experienced a widening of the wage distribution and retrenchment in welfare generosity. In figure 4 we show the level of welfare generosity and wage inequality in the same countries as we used above from the mid 1980s and from the early 2000. As a reflection of the pattern in Figure 1, the most prevalent pattern after 1985 is one of negative reciprocity, i.e. increasing wage inequality and decreasing welfare generosity. This is most visibly displayed in countries like Germany, Sweden and Denmark, though at very different levels, while the trends in wage inequality and welfare generosity are more varied in several of the other countries.

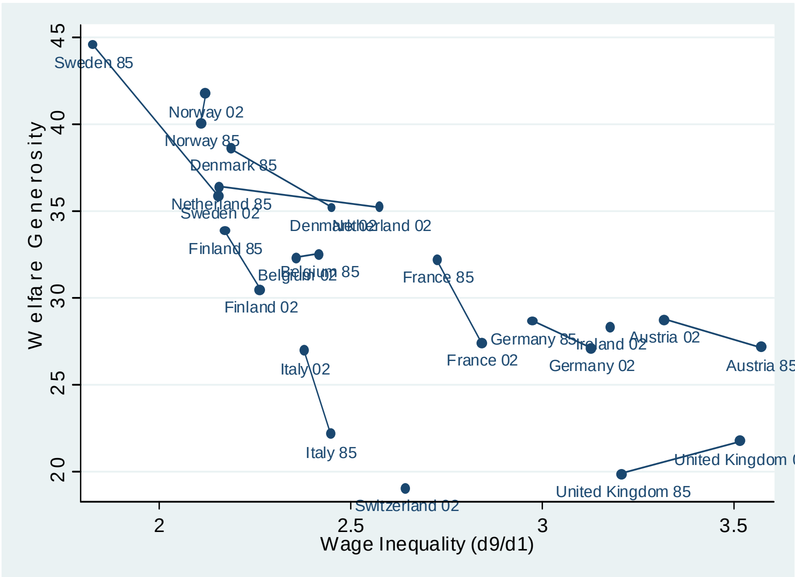
As stated it is not easy to identify the specific shock that turned the process. Most countries have experienced a technology shock of skill-biased technical change and internationalization, but it is difficult to believe that this shock is the single basic change that explains the reversion. Denmark, for instance, experienced high unemployment early in this period, and Sweden was hit by a serious financial crisis and recession early in the 1990s. One response to the crisis in both countries was to reduce welfare generosity somewhat (see Dølvik, Goul Andersen and Vartiainen in this volume). Together with high unemployment and restructuring in the labour market these changes could also have contributed to trigger the process of negative reciprocity. Similarly, Germany faced severe labor market adjustment and financial strain after the reunification, generating political pressure to reduce welfare spending and deregulate labour markets (see Hassel, Carlin & Soskice in this volume).

Italy and Austria, display the opposite pattern of Denmark, Sweden and Germany over this period. Yet their development of increasing welfare generosity accompanied by a compression of wage dispersion is consistent with our assertion. Belgium and Netherlands have experienced a relatively flat development in welfare generosity. The UK and Norway, in contrast, display both increasing wage dispersion and increased social spending after 1985[6]. In the UK, the Thatcher period brought cuts in the welfare state, and the later expansion of welfare generosity may be a reversion to the mean as New Labour increased public spending (see e.g. Mayhew & Wickham-Jones in this volume). The Netherlands show a similar picture, with severe cuts in the late 1980s being followed by

[6] Note that when we measure welfare generosity by the overall generosity index, Norway's rank increases relative to the position shown in Figure 3, where welfare generosity is measured by Public Social Spending as a share of GDP. This is a reflection of the high GDP in Norway, including oil revenues, but also a low take-up rate due to low unemployment and high employment/population ratio.

a certain welfare state expansion in the 1990s (see Afonso & Visser in this volume). Norway's expansion of welfare generosity is noteworthy. Unlike Denmark, but in line with Sweden and Finland, Norway was also hit by a serious banking crisis in 1990. It was not met by cuts in welfare however, as the right wing government was replaced by social democrats with governmental finances that allowed the country to overcome the crisis rather swiftly.

Figure 4. Welfare generosity and Wage inequality, mid 1980s and early 2000s.



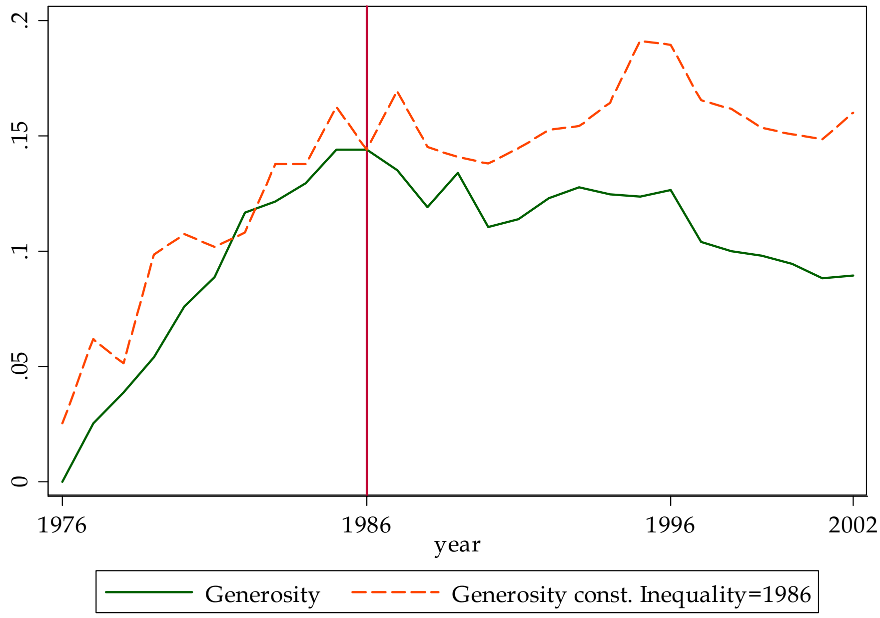
Note: Own calculations on the data underlying Figure 1. Years marked 1985 are averages between 1983 and 1987, years marked 2002 are averages between 2000 and 2004. See Figure 1 for data sources.

Counterfactual developments

To the extent that the turning points in most cases may be identified in social policy responses to economic and labor market shocks, it is particularly interesting to exhibit how the institutional reciprocity implies changes in the wage distribution. One way of doing this is to make the counterfactual thought experiment that wage inequality stayed constant, and then predict the development of welfare generosity that then would have emerged. Figure 5 shows the actual development of average generosity. On top of that we have drawn a counterfactual predicted welfare generosity under the condition that wage inequality remained constant at its low 1986 level. The gap between the dotted line and the solid line thus illustrates the impact of the (in)equality magnifying effect of wage dispersion on welfare generosity in this case.[7]

We find that welfare generosity would have been higher in the pre-1986 period since in this period wage inequality was still in decline. The gap between factual and contra factual welfare generosity would, however, be even higher in the period after 1986 since wage inequality actually started increasing over this period. In fact, from the impact of other forces, such as higher GDP per capita and the share of elderly in the population, welfare generosity could be expected to increase rather than decline during these 16 years if it had not been for the surge in wage inequality.

Figure 5. Actual and counterfactual growth in welfare generosity 1976-2002.



Note: Actual level in 1976=0. The solid line shows actual accumulated growth, as in figure 2, whereas the dotted line shows predicted growth provided that wage inequality was set constant equal to its 1986 level. Number of countries 14. Predicted generosity is calculated on the assumption of an elasticity of -.63, as estimated in Barth and Moene (2009).

A similar thought experiment may be undertaken with respect to wage inequality, keeping generosity constant. Welfare generosity dropped by about 5 percent from 1986 to 2002, which added to the surge in wage inequality. Keeping generosity constant would have chopped off about one fourth of the increase in wage dispersion during this period.

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[7] Note that we ignore the feedback effects, of course, when we make the experiment of keeping wage inequality constant.

Reciprocity interpreted

To understand the basis for institutional reciprocity we should be concerned with how policies reflect preferences in the electorate, how these political preferences depend on the basic economic outcomes in the labor market, and finally how the implemented social policies again affect the same basic distributional outcomes in the labor market.

In short, we should be concerned with how policies affect the labor market, and how these outcomes again affect the determination of social politics. The interaction between the politics of welfare spending and labor market outcomes may take many forms. Even though the implemented policies may reflect the political preferences of the electorate in a highly imperfect manner, there are important links between the political and economic interests of certain groups in the electorate and the determination of social policies.

The starting point

Recent changes in gross earnings inequality have been attributed to both institutional factors and to technological factors affecting the relative demand for different types of skills.[8] To explain how generosity of the welfare state affects the wage distribution, we emphasize how the bargaining position of weak groups in the labor market is improved relative to other groups, both in individual bargaining, union-employer bargaining, and in union-union bargaining.

To explain how the earnings distribution affects welfare generosity, we emphasize how protection against risks has been more universally sought and has been more important for the expansion of the welfare state, than pure redistribution of resources (Baldwin 1990, Barr 1992).

[8] See eg. Kahn 1998 and Moene and Wallerstein (1997) for analyses of the influence of bargaining institutions, Autor et al. 2008 for a thorough discussion with particular focus on the recent US experience, and Autor and Acemoglu (2011) for an elaboration of hypotheses related to technology and skills. For a broad exploration on redistribution in the United States and Europe, the small book by Alesina and Glaeser (2004) contains a lot of insights for the basic question why European countries developed such different attitudes towards redistribution than the United States. It does not look deeply into the differences between European countries that we highlight.

Building on Moene and Wallerstein (2001) we focus on welfare spending as social insurance against loss of income due to sickness, unemployment, and old age.

This may sound more restrictive than it is. Clearly, not all welfare state policies represent social insurance. Moreover, not all types of welfare are affected by changes in the income distribution. Moene and Wallerstein (2003) show that the programs of welfare spending that do react most to variations in the wage distribution are social insurance programs. By applying this insurance logic to welfare spending, we challenge some prominent theories that consider the welfare state a machinery for redistribution. Early works that contain this view include the influential papers by Romer (1975), Roberts (1977), and Meltzer and Richard (1981). One problem with the approach in these papers, however, is that pure redistribution is seldom legitimate. Policies that redistribute in addition to covering social demands for which the market fails to provide (for instance as incorporated in models by Iversen and Soskice 2001, and by Moene and Wallerstein 2001), are much more likely to be both legitimate and popular.

Alesina and Angelotos (2005) is the contribution closest to our reciprocal approach, in the sense that they focus on possible complementarities between wage compression and social insurance. Yet their mechanism is rather different from ours. While they argue that the welfare state reduces incentives to human capital formation, leading to a higher proportion of wage differences being explained by luck, which again adds support to welfare state arrangements, we emphasize how welfare benefits empower weak groups in the labor market, compressing wages from below, which again adds support for welfare spending.

The equality magnifying effect

To isolate the effect of inequality from the effect of changes in average spending power, we focus attention on a mean preserving change in inequality. This mean preserving change can for example represent a compression of wages by raising the wages below the mean wage and by reducing the wages below the mean wage.

All countries have a skewed wage distribution where the majority of workers earn incomes below the mean. A mean preserving compression thus implies that the majority of voters below the mean become richer. The impact of higher wage inequality on the political support for social insurance is therefore dependent on how wage earners below the mean react to higher incomes. We claim that social insurance is a normal good in the sense that voters below the mean who obtain higher incomes, but who are exposed to the same risks as before the income gain, simply prefer to be better insured.

This proposition may seem to run counter to key empirical facts. In a cross section of a society richer voters tend to be less supportive of higher taxes and government transfers than poorer voters. So when voters below the mean get richer one may think that they should resemble those who prefer less taxes and lower generosity. It is a great difference, however, between just receiving a higher pay in the social position and job one has, and moving upwards in the social hierarchy and changing both position and pay. For instance, different social strata have different risks of job and income loss.

In contrast to moving up the hierarchy, wage compression implies that the wage distribution is changed for a given distribution of risks across social groups. A given risk class prefers better insurance when their income goes up. The members have more to lose by losing their jobs, and they prefer to smooth their income streams across periods with good and bad luck. Thus wage equalization boosts the support for social insurance since a mean preserving compression of earnings improves the incomes of the majority of the voters without altering their exposure to risk.

The converse result from increasing inequality might seem more difficult to grasp. It may simply sound counter intuitive that voters who are left behind in their income growth should be less enthusiastic about welfare spending --- and also that political parties are benefiting from running on less generous welfare state programs under the circumstances. We do insist, however, that our claim here is based on a stylized economic logic that captures realistic sentiments of voters and politicians also in these cases

First of all it relies on a view where most voters are serious. Let us consider the case from one voter's point of view. The voter cares about her own family and perhaps also about other families and citizens who are not doing so well. Thus her voting is based on her social preferences. In considering the policies that benefit her social values the most, she has a rather clear picture of the costs and benefits of tax financed welfare spending. Even though social insurance is provided on better terms for the poor than for the rich, she knows that a more generous welfare state also costs her something when employed and healthy in the form of higher tax rates on her earnings.

She determines her most preferred policy by assessing her social preferences. She strikes a balance between the concern for her family's needs for disposable income when employed and in good health, and the concern for social insurance in the case of income loss due to unemployment or sickness. The weights she puts on the different concerns, depend on how vulnerable her family is for loss of income. In addition, she most likely also puts some weight on the social needs of other families with whom she identifies. The result is her ideal policy, describing her most preferred welfare state policy.

How does her ideal policy change when her income declines? She has the same concerns as before, but she cannot afford as much of everything as before. She most likely feels that the ideal policy now should accommodate more of the immediate gratification of her family's needs when employed and healthy. It is the earnings under these normal circumstances that have declined, and she wants to strike a new balance that incorporates lower taxes to modify the decline in earnings. Thus she opts for a less generous ideal policy of welfare spending.

In other words, by opting for a less generous policy she desires a feasible change that helps smoothing the lower earnings between situations when employed and healthy and potential situations with a loss of earnings due to unemployment or sickness. With lower earnings she feels that she can't afford an ideal welfare state that is equally generous as the one she most preferred before. She might still identify with other families, but she senses that she can't afford to be equally generous towards them as before.

Even though her ideal policy of welfare generosity has gone down, she may still prefer a more generous spending than her country actually has. The decline in the ideal policy of major groups of voters, is bound to spill over on the favored polices of political parties that compete for the support of these voters.

Political parties matter

We view political parties as serious and observant. Each of them is making compromises between ideology and opportunism; that is between the ideologically preferred level of welfare spending and the chances of winning the next election. When major groups of voters experience declining earnings for given risk levels, decisive voters' ideal policy becomes less generous.

A change like that of social preferences among voters translates into political competition between the left and the right. When a majority of voters have less income the right can realize more right wing policies without losing as many voters as it would before. The left may have to run on a less generous welfare state program in order not to lose marginal voters. Thus, both the right and the left easily become less generous and more right wing in their welfare state policy when they compete for the support of voters who experience increasing earnings inequality.

Yet, to what extent the majority of voters achieve what they want in terms of actual policies, depends on the political competition between political parties and to what extent political parties compromise between ideology and opportunism. If a party does trade off its ideological preferences against higher odds of winning the election, it will commit to a program that combines the interests of decisive voters with their own ideological preferred outcome. This implies that a shift among a majority of voters in favor of less welfare generosity would lead political parties to change their programs in the same direction. There may still be political differences among parties based on their ideology.

Thus it matters which party wins the election, but all parties are likely to run on a program that is already adjusted to the more unequal earnings distribution. How generous the welfare state becomes, therefore depends on the outcome of the political competition over voters' support, but the interests of voters are shaped by the pre-tax distribution of earnings. Regardless of who wins, it follows that a more unequal wage distribution reduces the generosity of the welfare state, contingent on the party in power.

The wage equalization effect

The level of generosity of the welfare state influences wage inequality. Explaining this wage equalizing effect of welfare spending on the wage distribution, we focus on how welfare benefits empower weak groups in the labor market relative to stronger groups.

Firstly, in a sense the generosity of the welfare state sets an implicit minimum wage that effectively raises the lowest feasible wage. Secondly, social insurance may also affect the fallback position of weaker groups in other ways. Weak groups are in effect exposed to a lower risk of income loss in connection with wage disputes and job-changes. This improves the bargaining position of all workers---but weak groups are more positively affected than stronger groups. All in all, welfare spending makes weak groups stronger and freer in choosing the best job alternative. They are therefore able to command a higher pay and thus to improve their relative wage.

Higher unemployment?

The wage equalizing effect may lead to higher unemployment as the lowest pay goes up. Yet it does not have to lead to lower employment and higher unemployment. The wage equalizing effect may also be associated with improved efficiency in the labor market. A more generous welfare state may raise the productivity of low paid workers as

- i) job applicants do not have to take the first job offer they get, but are able to wait for a better match, implying that higher welfare generosity leads to improved labor allocations;
- ii) low productivity job applicants get higher productivity as welfare spending may improve their health and education;
- iii) bad jobs are transformed to better jobs.

Points i) and ii) can very well be associated with employment expansion rather than contraction. In addition, employment of low paid workers may increase if the monopsony power of employers is reduced. Point iii) reflects how welfare spending may eliminate bad jobs, or turn some bad jobs into good jobs. There is also a fourth point that may be even more important.

iv) While a low wage may discourage effort, a high wage may work as a positive encouragement. In accordance with traditional efficiency wage arguments, employers might increase wages in order to raise profits by inducing higher efforts. Yet, in low productivity jobs it is also possible to raise profits by lowering wages as long as work efforts go down relatively less than the relevant wages. Powerful employers may gain by obtaining a larger share of a smaller pie. This low-wage-trap can be costly not only to the workers, but also to society at large. Production goes down and poverty increases, as profits go up. Employers simply gain by employing human resources inefficiently. With a generous welfare state this strategy becomes less attractive as the possibility to offer low wages declines. The result is again a compression of the wage distribution from below (Moene 2011).

The reverse dynamic of increasing wage inequality and declining welfare generosity involves a weakening of vulnerable groups and may lead to a less efficient production structure. A less generous income security can force more job seekers to accept job offers with lower pay, and thus strengthening the developments in the direction of a more inegalitarian society.

Institutional reciprocity

A process of increasing inequality tends to converge to a new political equilibrium. In this equilibrium a given level of welfare generosity implies a certain degree of wage inequality; and the given wage inequality implies a certain welfare generosity. The political economic equilibrium is achieved when the initial conditions are reproduced--in other words when welfare generosity produces a wage distribution that maintains the political support for the level of welfare spending that we started with. The equilibrium is reached by gradual adjustments –a cumulative process of wage settlements and politically driven welfare state adjustments.

It is this combination of the equality magnifying effect with the wage equalization effect that produces the institutional reciprocity. The combined effect may be unintended by any individual. Yet, the result may imply strong reciprocity between institutions in the welfare state and institutions in the labor market. Positive and negative institutional reciprocity can be propagated by the same mechanisms with different initial impulses.

Propagation and impulse

The wage equalizing effect associates wage inequality negatively with welfare generosity. According to this mechanism a one percentage increase in welfare generosity may reduce wage inequality by, say *a* per cent, where *a* is likely to be less than one. In addition there are other factors that have an impact on the level of wage inequality such as bargaining structure and the composition of the workforce. On top of this come stochastic shocks or random impulses to wage inequality.

The equality magnifying effect associates welfare generosity negatively with gross earnings inequality. According to this mechanism a one percentage increase in the inequality of earnings reduces the generosity of welfare spending, say by *b* per cent, where *b* is also likely to be less than one. In addition there are other factors that have an impact on welfare generosity such as per capita income levels of the country, fluctuations in the world economy and political composition of the government. Again, on top of this come stochastic shocks or random impulses to welfare generosity.

A process of positive reciprocity can for instance be started by a random impulse that increases welfare spending. This would again feed into higher support for welfare spending. More welfare generosity again reduces wage inequality by empowering weak groups in the labor market, which again feeds back into more welfare generosity. The positive reciprocity generates more equality in gross earnings and a more generous welfare spending. Similarly, a process of negative reciprocity can be initiated by an 'exogenous' cut in welfare spending, that would lead to increased earnings dispersion that would feed back into less generous welfare spending. An exogenous rise earnings differentials, say from technological change, would have the same effect: first it would induce less demand for generous welfare spending, feeding back into even higher wage inequality, and so on. Now inequality generates more inequality both in the distribution of earnings and in the generosity of the welfare state.

Quantitatively, we can express the total enhancement of institutional reciprocity by the parameters *a* (the wage equalizing effect) and *b* (the equality magnifying effect). Consider therefore an initial one per cent increase in the generosity of welfare spending implying an *a* per cent decline in the inequality of earnings. In the next round an *a* per cent decline in inequality of earnings feeds back to a *ba* increase in generosity of the welfare state, which in yet another round lead to a $b(ab)=ab^2$ per cent reduction in earnings inequality. This would again feed into higher welfare generosity by $a(ab^2)=a^2b^2$ per cent, and so on.

For each round the additional increase in welfare generosity and the additional decline in earnings inequality becomes smaller . Summing up all the increases along the cumulative process we would find that the welfare generosity has increased by a factor of $m=[1/(1- ab)]>1$ of the initial impulse to welfare generosity. Similarly earnings inequality has declined by a factor *ma* of the initial increase in welfare generosity. The factor *m* is the *equality multiplier* of the process.

A process of negative reciprocity can for instance be started by a random impulse affecting earnings inequality. This would increase earnings inequality, which again would lead to stagnating welfare generosity and yet higher earnings inequality. Again, summing up we would find that the earnings inequality would increase with the multiplier

$m = [1/(1- ab)] > 1$

of the initial impulse to wage inequality, and that welfare generosity would decline by the factor *mb.*

Assessing the magnitude of the equality multiplier

Institutional reciprocity explains a large part of the cross country variation that we have shown above. Using a panel of 18 OECD countries over 27 years we have estimated an empirical welfare generosity curve to quantify the equality magnifying effect, and an empirical wage inequality curve to quantify the wage equalizing effect (Barth and Moene 2011). In the estimates we use three stage least squares with exogenous instruments, and we are also able to obtain estimates of the equality multiplier, denoted *m* above.

In addition to institutional reciprocity effects there are important factors that determine welfare generosity including GDP per capita, openness, the share of elderly in the population, years with right wing government and union density. The equality magnifying effect is estimated to $b = .64$ suggesting that one percent change in the decile ratio of gross wages leads to a drop in welfare generosity by a little less than two thirds of a percent.

Important factors that determine wage inequality are GDP per capita, the share of elderly, openness, union density, bargaining coordination, industrial conflicts, the share with tertiary education and the employment percent of the working population. The wage equalization effect is estimated to $a = .53$, suggesting that a one percent increase in welfare generosity compresses the decile ratio by a little more than one half of a percent.

Combining the two effects we can estimate the multiplier to be around

$m=1/(1-ab)=1.5$, suggesting that the effect of an initial stimulus on any of the two variables is magnified by 50 percent after considering all the feedback effects caused by the mutual reciprocity.

The crisis after 2008

Many European welfare states are currently in a crisis. Following the financial melt-down of 2008 there is at the time of writing a financial and political turmoil. There are fear of cascading domino effects from the trouble in Greece and other countries. Whatever the effect that these troubles have on welfare spending and wage inequality, it is likely to be magnified by the social multiplier that institutional reciprocity implies.

In this situation two important factors influence the funding of the welfare state both directly and indirectly. Firstly, as the recovery drags on national incomes may decline and the tight fiscal constraints on many countries may become more severe. This clearly tends to *reduce* social spending. Secondly, the risks of job-losses and unemployment may go up. In particular it is clear that the perceptions of such risks have been increasing. This tends to *increase* the demand for social insurance and the popularity of the welfare state goes up. The result may be a frustrating widening of the gap between political demands and economic feasibility.

Wage inequality is also likely to be affected directly and indirectly. The bargaining power of low paid workers tends to drop when unemployment rises. Higher wages may also drop with the decline in rents to be shared and as the willingness to use bonuses and performance pay goes down. Countries with high levels of bargaining coordination may be able to protect low wages and to exercise wage restraint on higher wages with their coordinated wage setting. In countries with more market based wage setting one might expect a more dramatic raise in the wage differentials.

One possibility is hence that countries with the lowest wage inequality and the most generous welfare states before the crisis may have the best opportunities to sustain their position and even improve it by positive reciprocity, whereas in countries with more inequality and lower generosity the crisis may set off a process of negative reciprocity.

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