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ABSTRACT

This article investigates whether economic forces that have led to increasing wage inequalities also place structural constraints on the ability of welfare states to protect the most vulnerable in society. Throughout the past two decades, the capacity of minimum income packages to lift low-income households above the poverty line has stagnated or decreased across much of the European Union and the United States. In evaluating the determinants behind these trends, this paper introduces a framework to conceptualize the tensions facing modern welfare states in their attempt to (1) provide poverty-alleviating minimum income protections, (2) achieve employment growth, and (3) keep spending levels in check. We argue that, due to downward pressure on low-skilled labor, it has become more difficult to balance each of those three objectives; accordingly, we observe that the stagnation of low gross wages contributes to a 'structural inadequacy' around minimum income protections for the jobless. Albeit with large differences in both levels and trends, these structural constraints span across all welfare state 'regimes'. Our findings have direct implications for future policy changes to minimum income protections, as well as growing public and academic interest in the potential of a universal basic income.

Keywords: minimum income protections, poverty, inequality, welfare state change, social policy

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1 Introduction

Adequate safety nets are likely to reduce income inequality and poverty. But, do growing inequalities also influence the generosity of safety nets? And if so, how? Recent research suggests that higher income inequality lowers social benefits in ways consistent with power resource theories. The impact of indirect mechanisms such as the squeezing of the middle class and/or the weakening of labor's bargaining power have been scrutinized. We posit that there is (also) a *direct* relationship between low wages and minimum incomes. Specifically, we evaluate whether economic changes putting pressures on low-skilled work place mechanical constraints on the adequacy of minimum income protections for the jobless.

The influential works of experts such as the late Sir Anthony Barnes Atkinson, Paul Krugman, Joseph Stiglitz, Thomas Piketty and Branko Milanović have converged on one point: globalization and technological progress are making the currents of social market economies more unequal. Technological changes, globalization, the polarization between work-poor and work-rich households, individualization, and associated policies have sparked this inegalitarian turn through complex, inextricable interplays (OECD, 2011, 2015). The prevalence of these trends across the world of rich welfare states – albeit with big differences in both levels and pace of changes – fuels the idea of the existence of strong and ineluctable forces leading not only to increasing wage inequalities, but mounting pressures on the welfare state to protect the most vulnerable in society. As Atkinson (2015, p. 75) identifies, "the expansion of transfers, the rising share of wages, the reduced concentration of personal wealth, and the reduced dispersion of wages" are candidates for explaining the period of falling European income inequality during the 'Golden Age', while "the main reason that equalization came to an end appears to be (…) that these factors have gone into reverse (welfare-state cut-backs, declining share of wages, and rising earnings dispersion) or come to an end (the redistribution of wealth)".

Analyses linking macroeconomic forces to social inequality tend to focus on widening wage structures, top incomes, or wealth inequality. Moreover, generalizations about globalization and its detrimental impact on welfare states are rarely underpinned by empirical observations about the causalities at play. The focus of this paper is on the bottom of the income distribution. We start from the hypothesis that there is a link between the inadequacy of minimum income protection for the working-age poor on the one hand and the drivers of inequality and poverty on the other. But is there empirical evidence for such a claim? Is the structural capacity of the welfare state to protect the most vulnerable declining as a consequence of exogenous forces that also favor greater inequality? Or, do we rather witness policy related and country specific episodes (i.e. Atkinson, 2015) of rising and declining welfare generosity and associated convergences/divergences across countries and welfare regimes?

These questions supplement the traditional approaches taken by political scientists and social policy researchers, who tend to stress, respectively, the role of partisan politics and the capacity of institutions, social programs, coherent policy packages and/or discourses (Hemerijck, 2017; Cantillon, Hills, Goedemé, 2018). We instead investigate how exogenous socio-economic forces constrain the development of policies aimed at reducing levels of poverty. Specifically, our policy focus is on the levels of minimum income protection for the working age population *sensu lato*, i.e. minimum incomes for jobless households, gross minimum wages, and household incomes for full-time minimum wage earners.

We find reasons for both optimism and pessimism. The paper argues that there are indeed structural constraints on the increase of minimum incomes in rich welfare democracies which are likely linked to the inequality wave. However, the enormous differences across nations and welfare regimes suggest ample maneuvering space for policy makers, especially in countries where the social floor is highly inadequate. Since the 2000s there is also no

evidence of a universal decrease of the generosity of social floors for jobless households. We find that most welfare states are "working harder" throughout the past decade, but tend to prioritize higher financial work incentives rather than more generous minimum income protections for jobless households. The story behind the data is that the persistent and almost general inadequacy of minimum income protection for the poor is structural in nature, i.e. related to the levels and trends of gross wages. However, the enormous differences across nations also points to the importance of political agency.

2 Background & Theory

2.1 Minimum income protection and classic theories of the welfare state

In *Global Inequality,* Branko Milanović puts forward the notion of 'endogenous policies:' technology, openness and policy – the 'TOP elements'– are dependent upon each other and impossible to separate from each other in any meaningful way (Milanovic, 2017, p.132). He considers that policy is *endogenous*, meaning that it is necessarily imposed by economic pre-conditions. He writes that "…institutions and policies work within what economics allows: they are, if one wishes to use this term, 'endogenous' …" (p.73). This view was also prominent in Wilensky's seminal work on the development of the post-war welfare state. With the then available data, in *The Welfare State and Equality (1975)*, he showed that in the longer term, and from a macro-social perspective, the increase in government expenditures are attributed more to the development of economic and societal structures (e.g. growth; industrialization; changing family structures; women's liberation; and technological developments, particularly in the area of healthcare) than to partisan politics or ideology.

From this functionalist perspective the post-war development of the welfare state and its distributional programs are seen as a response to socio-economic changes which all

modernizing societies faced as a result of urbanization, population growth and economic development.

Many writings have rightly criticized this position for neglecting the crucial role of political and social conflict in welfare state development. Based on the "power-resources approach" many scholars have unraveled the political and social mechanisms that have led to the golden age of the welfare state (Gough, 1979; Korpi, 1983; Offe & Keane, 1984). It has been shown that the 'worlds of welfare capitalism' have been forged by harsh social and political conflict while there is also ample evidence of the impact of the middle class, employers' interest and the women's movements on the improvement of social protection (Esping-Andersen, 1990; Korpi, 1985).

The bulk of literature on the determinants of minimum income protections has been influenced by power resources and institutionalist theories. This is perhaps due to the 'cross-sectional' focus of most minimum income analyses: rather than to explain why minimum incomes have declined within a broad range of welfare states over time, most analyses effectively measure why income protections are stronger in, say, Social Democratic countries relative to Anglo-Saxon countries. On the political front, for example, a large body of comparative literature has demonstrated the importance of the role of partisan politics and the strength of social dialogue in shaping the adequacy of the social floor (Klitgaard, Schumacher, & Soentken, 2015 ; Scruggs and Hayes, 2017). Others have shown how, due to 'institutional stickiness' and the power of path dependence, variation across nations has largely persisted (Huber & Stephens, 2001; Pierson, 2001) while social policy researchers have tried to unravel the relations between the working of 'social fabrics' and the impact of political discourse (e.g. social investment) on the one hand and the generosity of social protection for the poor on the other (Marx and Nelson, 2014; Cantillon, 2011).

In this article we take a different approach. From a functional perspective, there are good reasons to believe that today's welfare states face increasing constraints on their capacity to protect jobless households. The tendency for the share of wages in national income to fall, the sluggish growth of low wages, the persistence of long-term unemployment among the low skilled, and the associated perceived need to strengthen work incentives might indeed be identified as strong candidates for putting structural pressures on the poverty-reducing capacity of welfare states. In *Reconciling Work and Poverty Reduction*, Cantillon & Vandenbroucke (2014) describe the existence of difficult trade-offs between levels of social spending, guaranteeing decent incomes for the poor, and ensuring work incentives. They write that "… the poverty alleviation function of social spending seems to have come under pressure as a consequence of the development of work-oriented benefits in order to discourage benefit dependency, to make work more attractive, and to enhance the work-life balance. There is… no denying of the tensions and trade-offs involved" (Cantillon & Vandenbroucke, p.322).

We build on this prior research to provide a new understanding of the evolution of social protection for the poor across wealthy democracies. To the best of our knowledge, the only previous research that has explicitly studied structural determinants of variation in minimum incomes over time are the works of Nelson (2013), focusing on adequacy as we do, and Van Vliet and Wang (2017), studying the related issue of replacement rates. Both papers analyse the developments of social assistance across OECD countries during the last two decades. Nelson's main focus was the relationship between changes in social assistance and active labour market policy, finding a consistent negative association. For their part, Van Vliet and Wang find mixed evidence on how two measures of 'globalization' – capital openness and trade openness – affect the replacement rates of social assistance. Neither study focuses on minimum income packages at large (conceptualizing the relationship between

minimum incomes for the jobless and net incomes for those employed at low wages), nor do the studies narrow their analytical focus on the role of low gross wages – a central concern in our analysis.

These prior findings provide a firm starting point for understanding the trends and the drivers behind minimum income protection. Still lacking in the literature, however, is a coherent conceptual framework and explicit examination of the role of structural limitations on minimum income protection. This is where we now turn.

2.2 The 'social trilemma': an operationalization of constraints to the adequacy of minimum incomes

In order to get an understanding of the precise mechanisms underlying the relationship between inequality trends and the capacity of the welfare state to reduce income poverty, we propose a simple framework based on the association between changes in low wages on the one hand and minimum income protection of working and jobless households on the other. We posit that shifts in minimum income protections must be understood as part of a three-way trade-off among states' attempts to ensure some balance among (1) the adequacy of incomes among non-working households, (2) the 'effort' required of the welfare state, and (3) the financial incentive (at the extensive margin) for an individual to seek employment.

Figure 1: Stylized representation of the 'social trilemma' among the adequacy of minimum incomes (ADE), gross-to-net effort (EFF), and financial incentive to work (WORK)

At the core of this 'social trilemma' is a hierarchy of incomes between the state and the market: in capitalist democracies, avoidance of employment traps at the individual level requires that net income from employment exceed net income from social assistance. Thus, wages toward the bottom of the earnings distribution act as a 'glass ceiling' over the adequacy of minimum incomes; when low wages stagnate or decline relative to median incomes, it becomes increasingly difficult for minimum incomes to lift households toward or above the poverty threshold.[1]

Figure 1 depicts a stylized representation of the social trilemma. We demonstrate a decline in gross wages from time *0* (left) to time *1* (right). Here, the adequacy of minimum income protections (ADE) is conceptualized as the value of the income protections relative to

[1] Particularly as even in the most generous countries, minimum wages tend to fall short of the poverty threshold for families with dependent children.

the country's poverty threshold (or median income). The distance between ADE and net income from full-time work can be understood in our framework as the *financial incentive to work* (WORK) at the extensive margin. Net income is the sum of gross (pre-tax and pre-transfer) wages from the market at the 10th percentile gross wage distribution and any tax or transfer supplements to boost the gross wage. An increase in ADE will mechanically lead to a decrease in WORK unless net income from full-time employment also increases. We refer to the difference between *gross* and *net* gains from full-time employment as *gross-to-net effort* (EFF) to reflect the welfare state's enhancement to the value of gross incomes. In practice, policies to increase gross-to-net incomes come in several forms, including earnings-related tax credits, child benefits, housing subsidies, and reductions to existing payroll taxes (Eichhorst & Konle-Seidl, 2008; Kenworthy, 2015; Marchal & Marx, 2017)**.**

Given the decline of low gross wages in our stylized scenario in Figure 1, the only way for ADE to increase without generating a reduction in WORK is if EFF also increases. The same would be true if gross wages were stagnant, rather than declining as we depict here. This highlights the logic of the social trilemma: due to pressures on low wage growth, it is increasingly implausible for a welfare state to combine high ADE, high WORK, and low EFF.

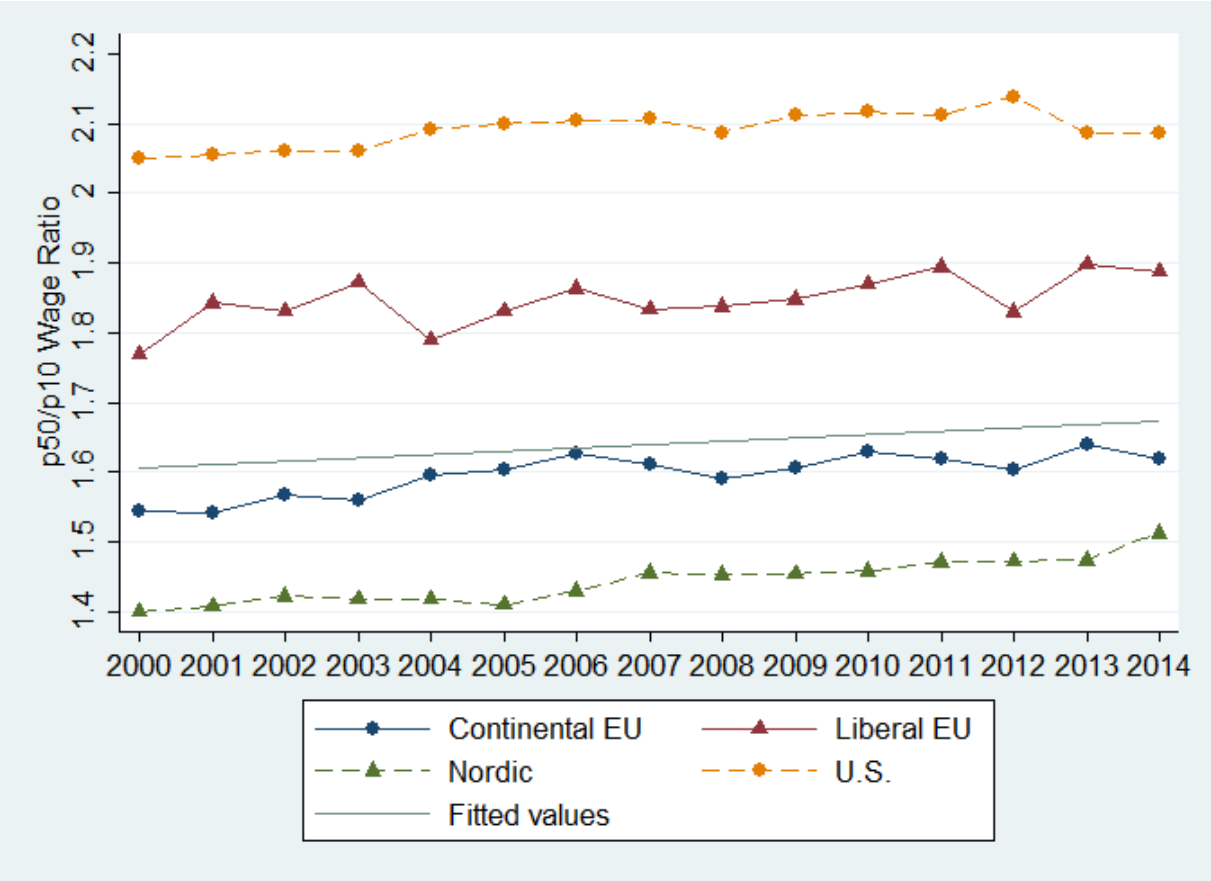
We expect that the combination of components - ADE, EFF, and WORK - that a state prioritizes is largely a product of political-institutional conditions and, due to path dependence and institutional stickiness, is unlikely to shift dramatically over the short run. For example, any cross-sectional analysis that compares the United States to Sweden, whether conducted in 1990 or 2014, is likely to find that the U.S. gives greater priority to enhancing the financial incentive to work and less to the provision of an adequate social floor, while Sweden tends to adopt the opposite approach. The more interesting question, in our view, is whether common macroeconomic forces have pushed the Swedish and American welfare states in a common direction.

We focus primarily on the stagnation or decline of low gross wages as the mechanism through which structural pressures influence minimum income packages. Specifically, we evaluate two hypotheses: (1) that declines in low gross wages relative to median income will be associated with declines in ADE and (2) in order for growth in ADE to exceed growth in low gross wages, welfare states must generally increase EFF to compensate for potential declines in WORK.

Indeed, in the event of a slow-down in the growth of low gross wages, welfare states can respond with one of two policy options to increase net incomes from employment: an increase in the statutory minimum wage and/or increased social spending (EFF) in order to compensate for falling low wages. The former pushes the costs of labour to employers, but at the risk of suppressing labour demand and lowering levels of employment (Iversen & Wren, 1998; Neumark & Nizalova, 2004; Neumark & Wascher, 2006). The latter, meanwhile, may avoid the adverse employment effects, but at the cost of increasing the effort required of the welfare state to boost net earnings.

Figure 2 demonstrates that low gross wages have stagnated or declined relative to median wages from at least 2000 onward. To demonstrate that wage stagnation is not unique to one type of welfare state, we cluster the trends by welfare state regime. In doing so, we largely follow the typical social democratic (Sweden, Denmark, Norway, Finland), conservative or continental European (Austria, Belgium, Germany, France, Luxembourg, Netherlands), and liberal (United Kingdom, Ireland, United States) welfare state breakdown (Esping-Andersen, 1990). Within the graph, however, we separate the United States from the latter grouping to highlight its uniqueness even relative to the European 'liberal' welfare states.

Figure 2: Lower-Half Wage Inequality (p50/p10) by Regime (2000 to 2014)



Note: Y-Axis does not begin at zero. Data source: OECD (2017).

Increasing wage inequalities reflect a broader set of evidence regarding the increasing pressures on low gross wages and low-skilled workers. Consider, for example, that employment rates among low-educated workers have, on averaged, declined among OECD Member States from 1994 to 2014 (OECD, 2017b). During the same timeframe, the share of workers earning low pay (defined as less than two-thirds of median earnings) has increased across the European Union (OECD, 2017b). And among countries with statutory minimum wages, we find that the value of minimum wages relative to median wages of full-time workers has remained stagnant, on average, from 2000 onward (OECD, 2018). Though we focus primarily on the evolution of low gross wages as the mechanism placing downward

pressure on minimum incomes for the jobless, the collection of trends cited above should help us to understand the 'structural' or 'functional' inadequacy of minimum income protections.

3 Data & Methods

3.1 Measuring Minimum Income Protections

To measure the dimensions of minimum income packages, we use indicators of policy inputs, rather than social spending or social outcomes, to gauge states' responses to shifting macroeconomic trends. The use of policy inputs helps to forego the common 'dependent variable problem' in social policy research and to isolate the *intent* of policies, a practice that has been applied more frequently in recent research (Cantillon, Marchal, & Luigjes, 2017; Cantillon & Vandenbroucke, 2014; Marchal & Marx, 2017). We examine the evolution of minimum income packages for single parent families in each of our cases over time, as these households tend to be among the most vulnerable to poverty and the most frequent target of social assistance policies. In a sensitivity check, we also re-analyze our results using an average of values across three different family types: a single adult, a lone-parent with two children, and a two-parent family with two children. The results are not substantively different from the results we present in our primary analysis.

We rely on three different sets of policy input data: the CSB MIPI database (Van Mechelen, Marchal, Goedeme, Marx, & Cantillon, 2011), the OECD Benefits & Wages database (OECD, 2017a), and the SaMIP (Swedish Institute for Social Research, 2015). Each dataset has its relative advantages over the other two. The CSB MIPI, for example, provides the full range of measures necessary to calculate minimum income packages, but at irregular time intervals over a long period of time (1992 to 2012); thus, it is useful for depicting long-run trends in minimum income packages, but less helpful for estimations of year-to-year changes. This is where the OECD and SaMIP databases come in: both provide annual data on

minimum income packages. The SaMIP database, however, only provides values for ADE (from 1994 onward), whereas data from the OECD can be used to calculated ADE, WORK, and EFF, but only from 2005 onward. The minimum income packages across these three datasets are heavily correlated, but are not perfectly consistent. We specify in each analysis below which dataset(s) we apply; wherever possible, we re-estimate our analyses using the alternative datasets to ensure consistency of results.

Our case selection includes 15 EU Member States and the United States.[2] This includes all cases available across our OECD, MIPI, and SaMIP datasets. Given evidence of state-level diversity and increasing divergence in social policies across the 50 United States (Parolin, 2016), the descriptive part of our evaluation separates the US into three states – New York, Michigan, and Mississippi. These three states respectively represent the most, median, and least generous states with respect to the provision of social assistance in 2014.

We use the EU poverty threshold defined as incomes lower than 60% of the median income in each country as the leading benchmark of adequacy. Two premises underlie this choice: a) each household should have at its disposal the minimum income required for participation in its society and b) on the national escalators of income growth (or decline), the discrepancy between those at the bottom and those in the middle should decrease, if success is to be claimed. Taking this perspective of relative income poverty we must of course be aware of the fact that this measure has inherent conceptual and methodological shortcomings, which may lead to overlooking some failures and/or successes (see for a discussion Decancq, Goedeme, Van Den Bosch, and Vanhille (2014)).[3]

[2] EU Member states include Austria, Belgium, Germany, Denmark, Spain, Finland, France, Ireland, Italy, Luxembourg, Netherlands, Norway, Portugal, Sweden, and the United Kingdom.

[3] This poverty threshold is also built on the assumption that economies of scale at the household level are proportional to the level of household income and constant across countries. The context for the thresholds given by reference budgets suggests however that in many cases the thresholds underestimate the minimum financial resources that a household requires for adequate social participation, especially in the poorest EU Member States (Goedemé, 2018).

Given this, we conceptualize our 'ADE' indicator as the level of income protections relative to the country's poverty threshold. For example, if a country sets its minimum income protections at 20 percent of the poverty threshold in a given year, its value for the ADE dimension is set to 20. We conceptualize 'WORK' as the net gains of full-time employment at the 10th percentile gross wage distribution *minus* ADE (see Figure 1 for visual representation). For example, if net income from employment provides an income at 100 percent of the poverty threshold, but ADE provides net income at 20 percent of the poverty threshold, then WORK would be calculated as 80 percentage points. Finally, 'EFF' is measured the difference between *gross* and *net* income from full-time employment at the 10th percentile gross wage. For example, if a set of policies increases an wage-earner's income from 80 percent of the poverty threshold to 100 percent of the poverty threshold, EFF would be calculated at 20 percentage points.

3.2 Analytical Approach

How have changes in low gross wages within countries affected changes in the adequacy of minimum income protections (ADE)? To test our first hypothesis, we use annual data on ADE from the SaMIP dataset, as it provides the longest time coverage (1994 to 2014). As we are interested in assessing changes within countries over time, we apply a fixed effects model to our panel data and estimate how changes in ADE are associated with changes in low gross wages. The model applied in this analysis is specified as follows:

$$(1) \quad (Y_{jt} - Y_{j,t-1}) = \beta_0 + \beta_1 Y_{j,t-1} + \beta_2 X_{j,t-1} + \beta_3 (X_{jt} - X_{j,t-1}) + \delta_t + \partial_j + e_{tj}$$

in which *j* indexes country and *t* indexes years. Y_{jt} is our ADE variable for the given country-year; the outcome predicted is thus the change in ADE from the previous year. β_1 measures the one-year lag of the outcome variable, a standard inclusion in models estimating

dynamic effects. X_{jt} represents low gross wages (10th percentile of the gross wage distribution in the country-year relative to median income) and is our primary explanatory variable. β_2 thus captures a one-year lag of the variable, while β_3 measures the effect of a change in low gross wages from the previous years. A positive coefficient on β_3 would suggest that changes in low gross wages do, indeed, evolve in parallel with the adequacy of minimum income protections; this would provide support for our first hypothesis. We include year fixed effects (δ_t) and country fixed effects (∂_j) to account for any unobserved heterogeneity across time or place that may affect change in ADE.

As our ADE and low gross wage variables are measured relative to median income in each year, a relationship between the two may be due primarily to changes in the median income rather than fluctuations in the actual values of ADE or gross wages. On one hand, this should not be problematic: if the adequacy of a household's income ought to be measured relative to median incomes within the country-year, then measuring our indicators relative to each year's median is in line with contemporary inequality and poverty research. To assess whether the relationship between the two variables over time is due solely to fluctuations in median incomes, however, we also present the results of an estimation in which ADE and low gross wages are set relative to a *fixed* median income (anchored at the country's median in 1994, the first year of analysis); thus, changes over time in this subsequent estimation are solely due to changes in the numerator (absolute levels of ADE) rather than the denominator (median incomes).

An analysis of our second hypothesis – that EFF will generally increase with ADE grows more quickly than low gross wages – requires usage of the OECD dataset, as we are interested in measuring EFF and WORK, as well, which the SaMIP does not provide. This limits our sample to a more recent set of years: annual data from 2005 to 2014. We evaluate our second hypothesis with the following estimation:

$$(2) \quad (Y_{jt} - Y_{j,t-1}) = \beta_0 + \beta_1 Y_{j,t-1} + \beta_2 X_{j,t-1} + \beta_3(\Delta ADE - \Delta GI) + \delta_t + \partial_j + e_{tj}$$

In equation (2), our outcome (Y_{jt}) is now gross-to-net effort (EFF). We measure change in EFF and include a one-year lag in the estimation. $\beta_2 X_{j,t-1}$ now represents two separate lag variables: one for ADE and one for changes in low gross incomes. β_3 now captures the effect of the rate of change in ADE ($\Delta ADE = (ADE_{jt} - ADE_{j,t-1})$) minus the rate of change in low gross incomes (GI). If this coefficient is positively signed, it would support our second hypothesis that increases in minimum income protections beyond the growth of low gross wages generally push the welfare state to also subsidize net incomes of low-wage earners, presumably to sustain the relative incentive to work at the extensive margin.

4 Findings

4.1 Patterns & Trends in the Social Trilemma

We first present patterns and trends across welfare states and over time. The subsequent section then formally evaluates our two hypotheses. Table 1, below, breaks down each state's approach to the social trilemma in 2001, the first year in which data for the full set of examined countries is available. The values of each component of the trilemma are presented, with standard deviations relative to the overall mean value in a given year listed underneath. These patterns from 2001 (using CSB MIPI data) provide us a starting point for understanding the different approaches states can take to balancing the three goals before we evaluate how structural changes have affected each dimension of the trilemma within countries over time.

As Table 1 shows, no cluster of states performs relatively well (above the universal mean) in each of the three sides of the trilemma. Instead, different welfare state regimes prioritize different components of the trilemma. The *Continental European* states feature

above-average ADE, but with above-average EFF and below-average WORK. The *Liberal* welfare states, on average, featured above-average WORK, but with lower ADE and higher EFF. The *Social Democratic* welfare states, meanwhile, achieve high ADE with low EFF, but at the cost of WORK (though possibly compensated by stronger activation policies). The descriptive patterns of the trilemma provide a better understanding of the nature of the differences across welfare state regimes and how different policy choices may be made in the face of common macroeconomic pressures.

Table 1: Different Approaches to the Social Trilemma By Regime (2001; values of dimension presented with standard deviations relative to the mean in parentheses)

	ADE	EFF	WORK
Austria	97.29 (1.04)	26.30 (-0.19)	0.00 (-1.13)
Belgium	83.35 (0.36)	2.03 (0.82)	20.77 (-0.16)
Germany	88.52 (0.61)	73.09 (-2.14)	50.82 (1.24)
France	88.73 (0.62)	16.52 (0.22)	25.17 (0.04)
Luxembourg	77.55 (0.07)	11.21 (0.44)	-3.78 (-1.31)
Netherlands	81.75 (0.28)	10.17 (0.48)	11.61 (-0.59)
Continential EU (Mean)	**86.20** **(0.50)**	**23.22** **(-0.06)**	**17.43** **(-0.32)**
Denmark	97.94 (1.07)	-23.62 (1.89)	-13.22 (-1.75)
Finland	91.11 (0.74)	27.36 (-0.23)	30.23 (0.28)
Norway	72.08 (-0.20)	16.46 (0.22)	21.06 (-0.15)
Sweden	91.05 (0.74)	3.34 (0.76)	7.21 (-0.79)
Social Democratic (Mean)	**88.05** **(0.59)**	**5.88** **(0.66)**	**11.32** **(-0.60)**
Ireland	71.90 (-0.21)	11.80 (0.41)	6.06 (-0.85)
United Kingdom	79.95 (0.19)	67.31 (-1.90)	48.97 (1.15)
New York (U.S.)	46.31 (-1.46)	30.32 (-0.36)	36.67 (0.58)
Michigan (U.S.)	38.53 (-1.85)	23.23 (-0.06)	33.65 (0.44)
Mississippi (U.S.)	35.15 (-2.01)	30.26 (-0.36)	57.84 (1.57)
Liberal (Mean)	**54.37** **(-1.07)**	**32.58** **(-0.45)**	**36.64** **(0.58)**

Note: Standard deviations of EFF are inverted; thus, higher EFF score indicates lower gross-to-net efforts. ADE= adequacy of social floor; WORK = financial incentive to work; EFF = gross-to-net efforts for low-wage earners. Data source: CSB MIPI.

To what extent have these patterns changed over time? Again using CSB MIPI data, we present changes in each component of the social trilemma across welfare states over two 10-year periods. The first – 1992 to 2001 – includes only the American states and six Continental European welfare states, as data was unavailable for other countries at the two time points. The second table, which measures change from 2001 to 2012, includes data for 12 welfare states (all for which data was available). We find that in both periods, EFF grows more quickly than ADE, while WORK steadily increases throughout.

Table 2: Changes in Components of Social Trilemma (1992 to 2001)

	ADE	EFF	WORK
Austria	10.75	6.94	0.00
Belgium	-3.48	3.24	5.22
Germany	-10.91	-9.71	-1.17
France	26.19	22.19	4.69
Luxembourg	-7.90	5.13	9.29
Netherlands	-24.81	21.41	16.98
Continental EU (Mean)	**-1.69**	**8.20**	**5.84**
New York (U.S.)	-7.55	2.39	8.85
Michigan (U.S.)	-3.64	4.05	9.27
Mississippi (U.S.)	-2.22	2.18	0.79
Liberal (Mean)	**-4.47**	**2.87**	**6.30**

Note: Values represent percentage-point change in variables between 1992 and 2001. ADE = adequacy of social floor; WORK = financial incentive to work; EFF = gross-to-net efforts for low-wage earners. Data source: Van Mechelen et al. (2011)

From 1992 to 2001, the adequacy of minimum income protections declined, on average, across the U.S. and Continental European welfare states, while gross-to-net effort increased. Consequently, the financial incentive to work increased across all states. Table 3 now expands the number of cases in looking at changes from 2001 to 2012, again segmented by welfare state regime.

Table 3: Changes in Components of the Social Trilemma (2001 to 2012; standard deviations relative to mean in parentheses)

	ADE	EFF	WORK
Austria	-0.87 (-0.40)	7.45 (0.08)	3.39 (0.16)
Belgium	3.82 (-0.09)	9.29 (0.56)	-3.24 (-0.15)
France	-14.69 (-0.88)	6.62 (0.38)	7.35 (0.34)
Luxembourg	14.42 (0.39)	25.80 (-0.76)	16.45 (0.77)
Netherlands	14.07 (0.34)	9.65 (0.34)	6.41 (0.30)
Continental EU (Mean)	**3.35** **(-0.13)**	**11.76** **(0.12)**	**6.07** **(0.28)**
Denmark	8.41 (-0.03)	35.20 (-0.52)	18.77 (0.88)
Finland	-4.48 (-0.49)	4.05 (0.28)	-9.84 (-0.46)
Social Democratic (Mean)	**1.97** **(-0.26)**	**19.63** **(-0.12)**	**4.47** **(0.21)**
Ireland	40.10 (1.48)	52.24 (-2.53)	36.84 (1.72)
United Kingdom	7.67 (0.10)	-14.85 (0.55)	-11.41 (-0.53)
New York (U.S.)	1.11 (0.13)	6.62 (0.04)	12.10 (0.56)
Michigan (U.S.)	-0.58 (0.12)	8.72 (0.08)	19.78 (0.92)
Mississippi (U.S.)	1.29 (0.23)	10.90 (-0.24)	14.57 (0.68)
Liberal (Mean)	**9.92** **(0.41)**	**12.73** **(-0.42)**	**14.38** **(0.67)**

Note: Percentage-point change in value is listed, with change in standard deviations relative to year-specific mean in parentheses below. Standard deviation of EFF is inverted; thus, negative SD of EFF change indicates increase in gross-to-net efforts (as indicated by positive absolute change). ADE = adequacy of social floor; WORK = financial incentive to work; EFF = gross-to-net efforts for low-wage earners.

From 2001 to 2012, we see that the social floor generally sees small increases relative to median household incomes, but not at the same rate as gross-to-net effort or the financial incentive to work. Importantly, the end point of this time period falls near the end (in many

states) of the Great Recession and thus may reflect policy reactions to the increases in joblessness during this period, as well as the declining value of median incomes and, thus, the poverty threshold (Marchal & Marx, 2017).

We highlight three brief observations from this descriptive data on patterns and trends in the social trilemma before advancing to our analyses of longitudinal determinants. First, the general inadequacy of minimum income protections in lifting lone-parent households above the poverty thresholds stands out. Though income protections in two states (Ireland and Denmark) briefly eclipse the poverty line after the onset of the Great Recession, the majority of states fail to provide poverty-alleviating levels of social assistance for jobless single-parent households. Within the United States, even the most generous state (New York) falls short of *half* the poverty line.

Second, states' relative prioritization of ADE, EFF, and WORK appears to change little during the 2000s. What does change, however, is a near-universal increase in EFF and WORK, as documented in Table 2.

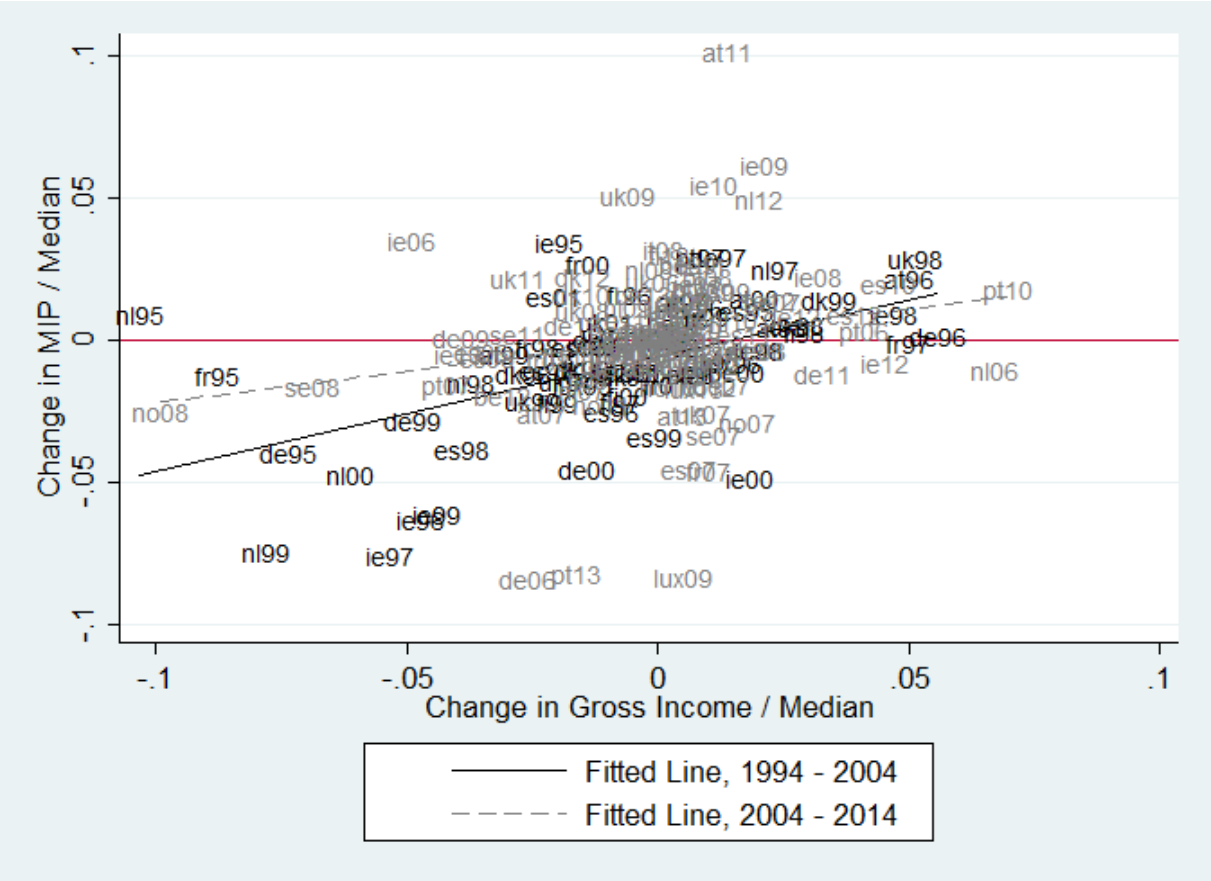
This leads into the third observation: from at least 2001 onward, we find that EFF and WORK grow more rapidly, on average, than ADE. In other words, the welfare state has worked harder in recent decades to subsidize low gross wages and to increase the financial incentive for households to seek employment. In many states, ADE has stagnated or declined; in most, it has grown more slowly than efforts to 'make work pay.' As detailed, we hypothesize changes in minimum income protections are partially driven by stagnating low gross wages, which contribute to a 'structural inadequacy' of minimum income protections. We now turn to our formal estimation of these hypotheses.

4.2 Effect of Low Wages on Minimum Income Protections

Figure 3 displays the bivariate relationship between annual changes in ADE and changes in low gross wages (10^{th} percentile) relative to the poverty thresholds over time.

As the figure shows, a positive correlation (r=0.36 across all years) exists between change in low gross wages and change in minimum income protections. In other words, we tend to see that ADE grows more rapidly when and where low gross wages also increase. Conversely, declines in low gross wages appear to constrain any growth in minimum income protections. These correlations do not assess a hard 'glass ceiling' effect, per se, but do show that ADE and gross wages tend to evolve in tandem. Though Figure 3 depicts changes when each variable is set relative to median incomes, the positive relationship remains when we apply our variables set relative to a fixed median (R=0.213). Thus, the relationship between gross wages and minimum incomes is not merely a product of changes in the median income; rather, declines in the former perhaps constrain growth in the latter. Although the correlation is not very strong, these findings provide tentative support for our first hypothesis.

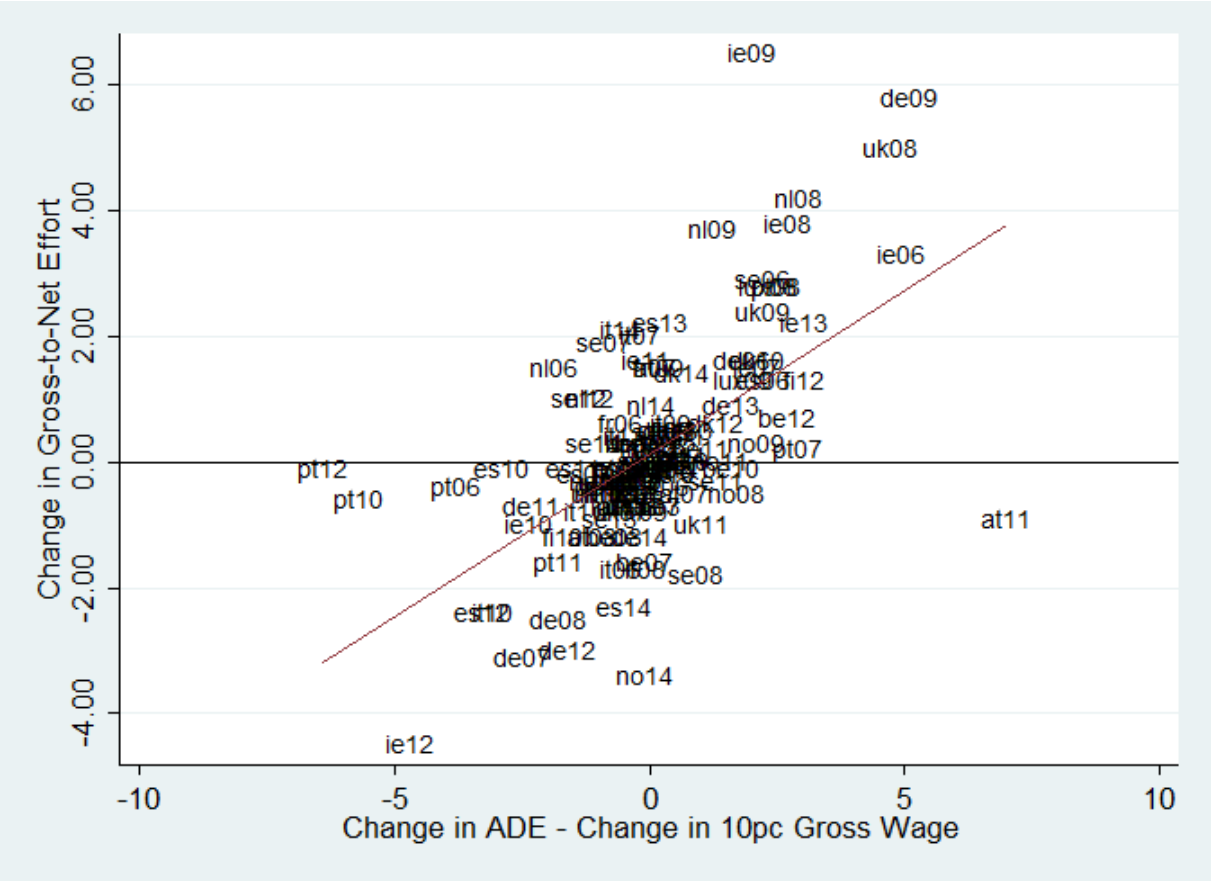
Figure 3: Change in Value of Low Gross Wages (p10) vs. Change in Adequacy of the Social Floor (Annual data, 1994 to 2004 and 2004 to 2014)



Note: R= 0.539 for changes between 1994 to 2004, and R= 0.202 for changes between 2004 and 2014. Gross wages and adequacy of the social floor are defined relative to poverty thresholds in the given state-year. When set to fixed poverty thresholds, the correlation among all years falls to R=0.213. Percentage-point changes between years are presented here. Data source: SaMIP (2015) and OECD (2017).

We now examine descriptive patterns related to our second hypothesis. Figure 4, below, shows bivariate relationships between changes in EFF and the rate of change of ADE to low gross wages.

Figure 4: Relationship between changes in gross-to-net effort (EFF) versus the rate of change in adequacy of minimum incomes (ADE) relative to change in low gross wages



Note: R= 0.587. Data source: SaMIP (2015) and OECD (2017).

Here, we use OECD data, which features the complete set of trilemma dimensions for each year from 2005 onward. A clear relationship exists: when the value of minimum income protections grows more quickly than the value of low gross wages, these changes tend to be coupled with increases in gross-to-net effort for working households. In some cases, the policies boosting ADE and EFF may be the same: an increase in universal child benefits, for example, will affect the incomes of both a non-working and employed single parent. In many other cases, however, the policies are de-coupled: increases in the value of employment-conditional earnings subsidies in the U.S., Belgium, Sweden, France, and elsewhere, for example, directly affect the net incomes of working households (and, thus, EFF) but not protections for the jobless (ADE). This again provides initial support for our second hypothesis.

Table 4: Fixed effects estimation of changes in adequacy of minimum income protections (ADE), 1994 to 2014

	Δ ADE	Δ ADE (Fixed Median)
Lagged Value, ADE	-0.0836	0.00403
	(-1.52)	(0.35)
Δ P10 Gross Wages	0.247***	
	(7.00)	
Lagged Value, P10 Gross Wage	-0.0811	
	(-1.13)	
Δ P10 Gross Wages (Fixed Median)		0.126*
		(2.87)
Lagged Value, P10 Gross Wage (Fixed Median)		0.00720
		(0.44)
Year Fixed Effects	X	X
Country Fixed Effects	X	X
Observations	178	192
R-Sq (Within)	0.318	0.313

Note: *t* statistics in parentheses. Data comes from SaMIP and OECD.
* $p < 0.05$, ** $p < 0.01$, *** $p < 0.001$

Do these findings hold in our fixed effects estimations? We turn to the results of our two models, as described in the prior section. Table 4 presents the results of our country and year FE model regressing change in ADE on change in low gross wages.

The first column estimates the results when ADE and low gross wages are set relative to each country-year's respective median income, while the second column presents results when the two are set relative to a fixed median. In both, we find an admittedly weak but positive and significant relationship between changes in low gross wages within a country and changes in the adequacy of minimum income protections for the jobless. In the first model, for example, our results suggest that if the 10th percentile gross wage declines by 10 percentage points relative to median income, we can expect minimum income protections for the jobless to fall by 2.47 percentage points relative to the median. If low gross wages remain

stagnant, we can generally expect to see no or little upgrading in the adequacy of minimum income protections.

Table 5: Fixed effects estimation of changes in gross-to-net effort (EFF), 2005 to 2014

	Δ Gross-to-Net Effort (EFF)
Initial Value, EFF	-0.487***
	(-5.56)
Initial Value, ADE	0.169
	(1.67)
Initial Value, P10 Gross Wage	-0.107
	(-1.93)
ΔADE - ΔGross Wages	0.176*
	(2.48)
Year Fixed Effects	X
Country Fixed Effects	X
Observations	117
R-Sq (Within)	0.499

Note: t statistics in parentheses. Data from OECD.
* $p < 0.05$, ** $p < 0.01$, *** $p < 0.001$

Of course, this is not an ironclad law: countries can (and many have) increase minimum incomes despite stagnant gross wages. When this does happen, however, welfare states must often 'work harder' to subsidize low wage earners to maintain relatively high financial incentive to work. Table 5 presents the results of equation (2), which tests this claim.

As Table 5 shows EFF is likely to increase when ADE increases at a faster rate than low gross wages. As noted before, this relationship may exist in one of two forms: first, an increase in the value of a universal benefit that affects working and jobless families would increase ADE and EFF if the value of the benefit exceeds changes in low gross incomes. Second, states may implement separate but near-simultaneous policy changes to increase ADE (through an increase in means-tested social assistance) and, to avoid a subsequent decline in WORK, then explicitly increase EFF (through employment-conditional wage

subsidies or other means). In practice, we find evidence of both occurring during the years of examination. In some countries increases in, for example, universal family benefits benefited working and non-working households (the first of the two relationships presented above); in most cases however, EFF was mostly influenced separately through an increase in tax reductions (Immervoll, 2007; Marx, Marchal, & Nolan, 2013).

5 Discussion & Conclusion

Why do rich welfare democracies fail to reduce poverty? Are the trends in social protection for the poor a consequence of lack of effective political will and/or power to protect the most vulnerable, or do they rather reflect systemic limits, structural constraints and functional pressures? While the bulk of literature on the determinants of minimum income protection seems mostly influenced by power resource and institutional theories, this paper investigates the mechanical constraints on minimum incomes. We attempted to determine how levels and trends of low wages affect the poverty-reducing capacity of the social floor for jobless households in recent years. We applied a simple model linking changes in low gross wages with the adequacy of minimum income protections, work incentives, and welfare state effort to boost low wages. The aim was to add conceptual and empirical clarity to the disappointing evolution of minimum income packages within the European Union and United States and, in doing so, to contribute to theories of welfare state change.

Our findings suggest that the inadequacy of minimum income protections cannot generally be attributed to welfare state retrenchment; on the contrary, welfare states are "working harder", albeit differently, to increase the net income of low-wage earners. This increase in gross-to-net effort, however, does little for the financial security of jobless households; as the welfare state does more to compensate stagnant or decreasing low wages

and to support working households, the social floor generally remains inadequate at lifting jobless households out of poverty.

If macroeconomic trends shift the demand for labour toward higher-skilled and higher-wage occupations, and if such processes generates downward pressures on low gross wages, then our findings pose ample reason for concern for the future of minimum income protections across Europe and the United States. As the logic of the social trilemma illustrates, welfare states would have to increasingly subsidize gains from employment in order to maintain or increase the value of the 'social floor'.

Still, the large differences in minimum income packages across nations and welfare regimes suggest ample maneuvering space for policy makers, especially in countries where the minimum floor is highly inadequate. Cross-national comparisons clearly suggest that in order to make minimum incomes more adequate, social democratic and continental countries should increase 'gross-to-net' efforts while liberal welfare states should rather rebalance adequacy and work incentives while increasing minimum wages. More generally, our analysis points at the central role of wage bargaining institutions and adequate minimum wages.

Cost compensations (e.g. child benefits) and in-kind services might be used as an alternative way out of the trade-off between adequate income protection and work incentives. Governments can try to mimic the Danish model by reinforcing non-financial (dis)incentives to work rather than merely focusing on financial incentives. Moreover, the degree to which the 'glass ceiling' holds in a specific country may furthermore highly depend on the 'pre-distribution' (Hacker, 2013), i.e. the concentration of low-wage earners. We also need to examine more in detail which characteristics of in-work benefits are most effective at achieving employment and poverty aims (Vandelannote & Verbist, 2016).

Finally, the concept of the social trilemma also has direct implications and relevance for the growing interest in the potential of a universal basic income (UBI) (Parijs & Vanderborght, 2017). The tensions inherent within discussions of a UBI mimic those within the evolution of minimum income protections: a desire to ensure an 'adequate' income for all while balancing concerns of labor supply and fiscal restraint. Exporting the framework of the trilemma to conceptualizations of the UBI would provide a clearer recognition of the trade-offs inherent within such proposals and, given trends in minimum income packages throughout the past decades, may cast skepticism over political and economic willingness or capability to implement poverty-alleviating levels of social assistance on a universal and unconditional basis.

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