Distributional effects of a minimum wage in a welfare state - The case of Germany

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Abstract

While employment effects of minimum wages have been extensively investigated, their effects on the distribution of incomes have received much less attention. Yet, a popular argument for a federal minimum wage is that it will prevent in-work poverty and reduce income inequality. We examine this assertion for Germany, a welfare state with a relative generous means-tested social minimum and high marginal tax rates. Our analysis is based on a microsimulation model that accounts for the interactions between wages, the tax-benefit system and net incomes at the household level as well as employment and price effects on the distribution of incomes induced by the introduction of a minimum wage. We show that the impact of even a relatively high federal minimum wage on disposable incomes is small because low wage earners are scattered over the whole income distribution and wage increases would to a large extent be offset by reductions in means-tested welfare transfers and high marginal tax rates. Taking into account negative employment effects and increases in consumer prices induced by the minimum wage would wipe out any positive direct effects on net incomes of households affected by the minimum wage.

KEYWORDS: minimum wage, wage distribution, employment effects, income distribution, inequality, microsimulation

JEL classification: I32, H31, J31

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Contents

1 Introduction

The extensive literature on the economic effects of minimum wages primarily focuses on employment (Brown, 1999; Neumark and Wascher, 2008). Far less attention has been devoted to the question if and to what extent minimum wages affect the distribution of disposable household incomes. Distributional effects are addressed by two strands of the minimum wage literature. The first strand refers to the question to what extent a minimum wage affects the wage distribution and inequality of labor earnings. The second strand refers to the impact of a minimum wage on the distribution of disposable household incomes and overall inequality. One important result of this literature is that wage gains induced by the minimum wage are not necessarily concentrated on people living in households with low incomes. Another important result is that wage gains are to a large extent offset by high marginal tax rates in the presence of means-tested social transfers. The empirical literature mainly refers to Anglo-Saxon countries[1], although statutory minimum wages are in place in most OECD countries, with the notable exception of Germany (Immervoll, 2007).

In the wake of rising wage and income inequality (Antonczyk et al., 2010; Biewen and Juhasz, 2012), the introduction of a statutory minimum wage has become a dominant economic policy issue in Germany in recent years.[2] One line of argument refers to the decline in union coverage in the economy (Antonczyk et al., 2010). In this view, the wage bargaining system may no longer prevent 'excessive' downward wage pressure. Another argument holds that a modest minimum wage is a necessary complement to wage subsidies in the low-wage sector to prevent 'wage dumping' and 'unfair' wage competition. From a social policy perspective, a minimum wage is often seen as a means to mitigate income inequality and to prevent in-work poverty. This perspective is particularly relevant in the German welfare state with a relatively

[1] See, e.g., Johnson and Browning (1983), Burkhauser et al. (1996), Macurdy and McIntyre (2001), Addison and Blackburn (1999), Neumark and Wascher (2002), Neumark et al. (2005) for the U.S., Goldberg and Green (1999) for Canada, Gosling (1996) and Sutherland (2001) for the UK, and Maloney and Pacheco (2012) for New Zealand.

[2] Contract wages set at the industry level can be declared generally binding by the government on the basis of a special regulation contained in the law on the posting of workers. This law was first introduced in the construction industry in order to prevent firms from other EU countries to compete at lower wages than the contract wage set by German employers and labor unions; see Rattenhuber (2011). Since then it has been extended to the waste industry, to roofers and electricians, to the laundry industry, to painters and varnishers, and to care services.

generous level of the means-tested social minimum and very high marginal tax rates on low earnings (Knabe and Schöb, 2009; Müller and Steiner, 2009). Referring to the one or the other of these arguments, the introduction of a statutory minimum wage of 8.50 €/hour has recently been suggested by the Social Democratic Party and the labor unions, while the Leftist Party even propagates a minimum wage of 10.00 €/hour.

In this paper we analyze the implications the introduction of a statutory minimum wage would have on the distribution of disposable net incomes in a welfare state like Germany with a relatively generous social minimum and high marginal tax rates on earnings of people entitled to the social minimum. We investigate whether minimum wages of different magnitude would achieve the stated goal to increase household incomes of low-wage workers and reduce income inequality among the working population. The analysis extends previous work by Müller and Steiner (2009) where the effects of a statutory minimum wage on net household incomes and poverty were analyzed using a tax-benefit microsimulation model without taking into account employment and price effects induced by the introduction of the minimum wage. Given the complex tax-benefit system of the German welfare state, the microsimulation model is of central importance for a proper analysis of how changes in gross earnings induced by the minimum wage are translated into net household incomes. We use the same tax-benefit microsimulation model but extend the analysis in Müller and Steiner (2009) methodologically by incorporating these 'second-round' effects in the distributional analysis which are neglected in most previous studies (see Brown, 1999; Neumark and Wascher, 2008). Furthermore, we systematically simulate the distributional effects for various levels of a minimum wage representing the different strands of the political debate sketched above. The analysis is based on the most recent data from the German Socioeconomic Panel (SOEP).

In the next section we present our methodological approach to assess the distributional implications of a statutory minimum wage. Our simulation results presented in Section 3 show that a statutory minimum wage would have little impact on the overall distribution of net household incomes and the reduction of inequality. This would even hold if the minimum wage was set at a relatively high level. If negative employment effects are taken into account, the gain in net incomes is reduced by

half. Considering also increases in product prices induced by the minimum wage would wipe out all positive effects of the minimum wage on household incomes. The ineffectiveness of a minimum wage to increase net household incomes of the working poor and to reduce income inequality can be explained by the spread of low wage earners over the whole range of the net income distribution, household composition, the German system of means-tested income support, as well as negative employment and price effects induced by the minimum wage. We thus conclude that, at least for the German welfare state, the minimum wage is not an effective tool to mitigate income inequality and to prevent in-work poverty.

2 Empirical Methodology

We analyze the distributional impacts of the introduction of a minimum wage in several steps. First we discuss how we simulate the impact of different minimum wage levels on the distribution of hourly wages. Then we describe the microsimulation model that is used to translate shifts in the wage distribution into changes of net household incomes and how we account for employment and price effects ('second-round' effects) induced by the introduction of a minimum wage. Although we go beyond most previous empirical studies on the distributional effects of minimum wages by accounting for these second-round effects, our approach is limited in several ways. The simulation of wage effects rests on the assumptions about full compliance and no wage spillovers. Although we account for employment and price effects, we do not conduct a general equilibrium analysis. In particular, we do not consider adjustments of the capital stock induced by the minimum wage and also do not account for the distribution of increased government revenues resulting from reductions in social transfers and increased tax revenues on higher earnings. Nevertheless, our microsimulation approach has considerable advantages for the distributional analysis we address here.

2.1 Wage effects

We calculate minimum wage effects by comparing the observed wage distribution in the reference year by the hypothetical wage distribution conditional on the minimum

wage. The latter is obtained by replacing the observed hourly gross wage of those persons employed at a wage below the minimum by alternative levels (5.00, 8.50, 10.00€/hour) of a minimum wage. These alternative minimum-wage levels refer to the gross hourly wage exclusive of employers' social security contributions. For employees covered by social security, the employer has to pay a flat contribution rate of currently about 20 percent up to a fairly large threshold (about double the amount of mean earnings in the economy). For marginally employed workers, the employer has to pay a flat tax of 30% of earnings. Of course, in the absence of a minimum wage the incidence of employers' social security contributions is uncertain, and at least some shifting onto the hourly gross wage seems likely. In the presence of a minimum wage shifting part or all of the burden of employers' social security contributions onto wages would be prevented and the incidence would rather fall on employment. We abstract from negative employment effects for the moment, assume full compliance with the minimum wage and rule out spillover effects, i.e. wages higher than the minimum wage are assumed to remain constant.[3]

To calculate the wage distribution for 2013, we make use of wage data from the latest available wave of the German Socio-Economic Panel Study (SOEP). The SOEP is a representative sample of households living in Germany with detailed information on household incomes, working hours and the household structure (see http://www.diw.de/en/soep). We use the current wave for the year 2011 and extrapolate wages two years in the future assuming constant growth rates.[4] For each employed person, the gross hourly wage is obtained by dividing reported earnings in the month before the interview by the number of hours worked in that month, where paid overtime hours are included.[5] To account for measurement errors in the hours and wage data resulting in very low hourly wages, we exclude wages below 3€/hour earned in regular employment. This equals roughly the first percentile of the raw

[3]The empirical evidence on spillover effects is mixed. Grossman (1983) is one of the first to provide evidence for wage spillovers of the U.S. minimum wage. Autor et al. (2010) re-investigate early studies for the U.S. and conclude that estimated spillovers may entirely be an artefact of measurement error. Dickens and Manning (2004) reject spillover effects for the U.K. minimum wage, whereas Donald et al. (2000) find evidence for spillovers with Canadian data.

[4]To check the sensitivity of the results with respect to this assumption we estimated dynamic panel data models and predicted the future wages individually. Findings did not change significantly.

[5]This hourly wage measure may underestimate the effective hourly wage, for at least two reasons: First, since the majority of people in the SOEP is interviewed in the first three months of the year, fringe benefits are underrepresented. Second, 'paid hours' may partly be paid for in later months, or may be compensated for by working less than normal hours in the future.

hourly wage distribution. However, we do not exclude hourly wages below 3 €/hour if they refer to supplementary work of people drawing unemployment benefits. We conduct sensitivity analyses of the scenarios where hourly wages below 3 €/hour remain in the analysis as measured or are set to the margin of 3 €/hour, respectively. People in full-time vocational and apprenticeship training as well as disabled employees are discarded from the sample. "Secondary jobs", i.e. jobs held in addition to the main job, are excluded in the base simulations; a sensitivity analysis is provided.

2.2 First-round income effects

Even in the absence of any negative employment effects, wage changes induced by the minimum wage do not directly translate into higher disposable household income. First, low wage earners are not necessarily concentrated in the lower part of the income distribution at the household level. Second, interactions with the tax and transfer system lead to high marginal tax rates or substitution of transfer incomes among minimum wage earners. We model the link between gross wages and net household incomes using the microsimulation model STSM (Steiner et al., 2012). The model accounts for important interactions within the German tax-benefit system, in particular means-tested income-support schemes, exemptions of very low earnings from social security contributions, and the joint income taxation of married couples imposing relatively high marginal tax rates on secondary earners. This allows us to translate an increase in gross labor earnings induced by the minimum wage into net household incomes accounting for these factors.

The STSM is based on SOEP data and contains the main features of the German tax and transfer system. Gross household income is composed of earnings from dependent employment, income from capital, property rents and other income. Earnings from dependent employment is the most important income component for the great majority of households.[6] Taxable income is calculated by deducting various expenses from gross household income. The income tax is computed by applying the income tax formula to the individual incomes of unmarried spouses; for married

[6]The SOEP also contains information on earnings (and working hours) from a "secondary job", i.e. a job held in addition to the main job, which we add to wage income for the calculation of net household income.

spouses, income is taxed jointly based on an income splitting factor of 2. Employees' social security contributions and the income tax are deducted from gross household income and social transfers are added to get net household income. Social transfers include child allowances, child-rearing benefits, educational allowances for students and apprentices, unemployment compensation, the housing allowance, and social assistance. Since income components collected in the current SOEP wave 2011 refer to 2010, we extrapolate incomes to our base year 2013 using realized average growth rates for 2011 and 2012 and expected growth rates for 2013.[7] The tax-benefit system is also updated to include all changes in regulations up to 2013.

2.3 Employment effects

Wage increases induced by the minimum wage may affect employment due to changes in both the demand for and the supply of labor. Changes in labor demand are determined by the increase in labor costs induced by minimum wage and by the elasticity of labor demand. When labor demand is considered at all in simulation studies, average elasticities are either simply assumed or taken from the literature (Johnson and Browning, 1983; Macurdy and McIntyre, 2001). Here we use empirical labor demand elasticities differentiated by region, gender, qualification level and type of contract (full-, part-time and marginal employment) estimated by Freier and Steiner (2007, 2010).[8] These elasticities are conditional on the level of output and the capital stock and estimated separately for West and East Germany. They reveal a rather complex pattern of substitution and complementarity among labor inputs (see Table A1 in the Appendix). For instance, marginally employed women and women working part-time are substitutes in production whereas marginally employed women and skilled women with full-time jobs are complements. For a given demand for goods a relatively high increase in wages for marginally employed women induced by the minimum wage will lead to a decrease in labor demand for

[7] We assume that incomes will increase with the annual growth rate in that year. Average annual growth rates are derived from the following indices for the years 2011, 2012 and 2013: 1.023, 1.021, 1.018 for consumer prices; 1.030, 1.026, 1.026 for wages; and 1.035, 1.035, 1.035 for income from profits (source: National Accounts; BMWi (2010); own calculations).

[8] We distinguish between skilled (secondary school or vocational education) and unskilled (neither secondary school nor vocational education) full-time workers, part-time workers and marginally employed workers. These groups are differentiated by gender and region (West and East Germany) yielding 8 different categories. Highly skilled workers (with university degree) are assumed to be a quasi-fixed factor in the short run.

this group and also for skilled women in full-time, but an increase in labor demand for women working part-time.

To calculate the overall effects of wage increases induced by the minimum wage on labor demand we require, in addition to the compensated wage elasticities, also the price elasticity of consumption goods.[9] Since estimates of price elasticities at the required level of aggregation are not available for Germany, we assume alternative values of the average price elasticity across all consumer goods of 0, -1, and -2, respectively.

Given empirical substitution elasticities for $L = 8$ labor groups and alternative price elasticities, the change of the demand for labor of a specific group $k(\Delta B_k)$ to a relative change in the hourly wage of this group $(\Delta w_k/w_k)$ can be estimated by:

$$\Delta B_k = \sum_{l=1}^{8} c_l \left(\sigma_{kl} + \eta\right) \left(\Delta w_l / w_l\right) B_k \tag{1}$$

where σ_{kl} is the (Hicks/Allen-) substitution elasticity, c_l is the share of the wage costs of group l in total wage costs, and η is the price elasticity of demand for goods.

We will assume that the effect of the introduction of a minimum wage on employment is determined by labor demand. Although there may also be labor supply effects, they are fairly small and would hardly affect our distributional analysis. Using the same discrete-choice household labor supply model as in

Based on the estimated labor demand changes we predict the share of people who become unemployed $(\Delta B_k/B_k)$ for a given minimum wage level and for each labor type k.[10] We then draw a weighted random sample of the same size among those who are affected by the minimum wage (i.e. earn wages below the level of the minimum) per group k with the weights being determined by the distance between the earned wage and the minimum wage. The individuals selected in this manner become unemployed under the simulated minimum wage scenario. The unemployment probability varies with individual characteristics and the distance of the observed wage from the minimum wage level. We thus capture the distributional implications of potential disemployment effects. To account for the random nature

[9] We do not consider adjustments of the capital stock here. In the long run it is likely that low-skilled labor is substituted by capital.

[10] Depending on the assumed size of η the demand change is positive for some i. Since we abstract from labor supply effects and in order to simplify the analysis we disregard positive employment changes in this version of the simulation. The only group where this simplification is relevant are women working part-time in West Germany.

of individual unemployment probabilities, the procedure is repeated and average net household incomes are simulated 50 times.

2.4 Price effects

Firms facing higher labor costs because of a minimum wage will pass all or part of these costs onto consumers. The extent to which higher costs will be shifted into higher consumer prices will depend on market structure, aggregate demand and the time horizon. Under perfect competition and the assumption that the supply of goods is perfectly elastic in the long-run, higher labor costs will be fully borne by consumers. We follow this standard incidence assumption here and model the incidence of the price increase at the household level as in Macurdy and McIntyre (2001) who relate the rise in the cost of labor for different industries to price increases for various consumer goods using input-output tables.[11] Price increases for goods Δp_n produced in sector n result from wage increases in the same sector Δw_n (scaled by the share of wage costs ws_n), wage increases Δw_m in all other sectors m where intermediary inputs for sector n are produced (scaled by their share of wage costs ws_m), and the share of intermediary inputs in sector n in relation to all inputs as measured by the input coefficient a_{mn}:

$$\Delta p_n = (\Delta w_n) ws_n + \sum_m a_{mn} (\Delta w_m) ws_m \tag{2}$$

The increase in product prices is borne by all households depending on their level and structure of consumption expenditures. The consumption patterns at the household level are derived from the micro data of the Continuous Household Budget Survey ("Laufende Wirtschaftsrechnungen", LWR) provided by the German Federal Statistical Office (Statistisches Bundesamt, 2007). We use the one-digit classification of 12 non-durable consumer goods which can be linked to the production side using the input-output tables of the German Federal Statistical Office.[12]

Given our incidence assumptions, price increases induced by the minimum wage reduce real household incomes according to the level and the structure of household budgets. Thus, households who spent most of their income on consumption of goods

[11] Macurdy and McIntyre (2001) show that poor households are disproportionately affected by higher consumer prices induced by the minimum wage because of their above-average consumption rates, even though richer households bear the larger share of this burden in absolute terms.

[12] We thank Martin Beznoska for providing us with these calculations.

whose prices increase due to the minimum wage would be affected most. However, estimated price effects would only reduce real household incomes to the full amount if households did not adjust their expenditures. Since fully accounting for price and income effects would require the estimation of a fairly large expenditure system, we do not explicitly incorporate these effects in our distributional analysis here. [13]

3 Effects on the wage distribution

The impact on the wage distribution – disregarding employment effects for the moment – crucially depends on the level at which the minimum wage is set. Given our maintained assumption of no spillover effects discussed above, the minimum wage by definition only affects lower parts of the wage distribution: A minimum wage of 5.00 €/hour would only affect the first 5 percentiles, a minimum of 8.50 €/hour alters the distribution up to the 15th percentile and set at a level of 10.00 €/hour up to the 20th percentile. As Table 1 shows, a minimum wage of 5.00 €/hour amounts to about 30% of the median and 33% of the average gross hourly wage in the German economy.[14] These ratios increase to about 56% and 51% under a minimum of 8.50 €/hour and to 66% and 60% for a minimum wage in the amount of 10.00 €/hour. Only about 1% of all German employees would be affected by a minimum wage of 5.00 €/hour, whereas the incidence increases to more than 11% (19%) for a minimum of 8.50 €/hour (10.00 €/hour). Assuming full compliance with the minimum wage, it would disproportionately affect younger employees, those with low qualification, marginally employed people and those working in small firms (see Table A2 in the Appendix for a minimum of 8.50 €/hour).

The introduction of a minimum wage of 8.50 €/hour would increase the total wage bill by about 13.3 billion €/year, which is about 1.2% of the wage bill in 2013. The increase in the wage bill would be substantially lower for a moderate minimum of 5.00 €/hour and only amount to about 0.1% of the total wage bill. An increase in the minimum wage level to 10.00 €/hour on the other hand doubles the increase in the total wage bill to 26.5 billion €/year or 2.4% of the total wage bill.

[13] Müller and Steiner (2010) account for income effects but neglect price effects on consumption. We will refer to potential income effects on consumption when we discuss simulation results below.

[14] As mentioned above, wages below 3/hour are only included if they refer to supplementary work of peoply drawing unemployment benefits. People in full-time vocational and apprenticeship training as well as 'secondary jobs', i.e. jobs held in addition to the main job, are excluded here.

Table 1: The effects of a minimum wage on the wage distribution in Germany 2013

	No MW		MW=5.00 €/hour		MW=8.50 €/hour		MW=10.00 €/hour	
Incidence								
MW as % of								
Median				32.20		54.73		64.39
Mean				28.25		48.02		56.50
Affected (%)								
overall				2.33		12.93		19.95
1st decile				22.98		100.00		100.00
Change in wage sum								
Million €/year				954		13,339		26,492
% wage sum				0.09		1.22		2.43
Wage inequality								
10/50 percentile ratio (in %)	49.85	(48.74; 50.95)	49.85	(48.74; 50.95)	54.73	(53.87; 55.59)	64.39	(63.38; 65.40)
Δ (Δ %)			0.00	(0.00)	4.88	(9.79)	14.54	(29.17)
Gini coefficient (× 100)	29.62	(28.78; 30.46)	29.48	(28.64; 30.31)	27.81	(27.00; 28.62)	26.28	(25.48; 27.07)
Δ (Δ %)			-0.14	(-0.47)	-1.81	(-6.11)	-3.34	(-11.28)
Mean log deviation (× 100)	14.78	(13.95; 15.60)	14.43	(13.61; 15.24)	12.31	(11.56; 13.06)	10.98	(10.27; 11.70)
Δ (Δ %)			-0.35	(-2.37)	-2.47	(-16.71)	-3.80	(-25.71)
Atkinson ($\epsilon = 2$) (× 100)	25.37	(24.35; 26.39)	24.39	(23.42; 25.35)	20.00	(19.12; 20.88)	17.63	(16.78; 18.49)
Δ (Δ %)			-0.98	(-3.86)	-5.37	(-21.17)	-7.74	(-30.51)

Notes: Only employed people aged 18-65 are included. Wage projections for 2013 are based on average growth rates. Weighted data using sample weights to obtain population means. Δ wage bill is the difference between the wage sum with and without the minimum wage, with wage sum = $\sum$ (hourly wage × weekly working hours × 4.2); employers' social security contributions not included. The Gini coefficient is sensitive to changes in the middle of the income distribution. The mean log deviation of equivalent income is a 'bottom-sensitive' inequality measure. The Atkinson inequality measure is calculated for a high degree of inequality aversion ($\epsilon = 2$); see Cowell (2000). 95%-confidence bands are given in parentheses.

Source: Own calculations based on SOEP, wave 2011.

To assess the effects on wage inequality several synthetic measures are reported in Table 1. The ratio of the 10%-percentile to the median clearly shows no change relative to the status quo if a minimum wage as low as that 5.00 €/hour was introduced, but substantial increases in this ratio if the minimum wage was set at 8.00 or even 10.00 €/hour. Overall inequality, as measured by the *Gini coefficient*, would also only change significantly if the minimum wage was introduced at a relatively high level. The *Mean log deviation*, which is a bottom-sensitive inequality measure, and the *Atkinson inequality measure* (with the inequality-aversion paremeter $\epsilon = 2$) yield qualitatively similar results.

The wage simulations proved robust with respect to the forecasting with average growth rates. Estimating dynamic wage growth regressions and using individual growth rates does not affect the results. Another sensitivity check concerns the treatment of secondary jobs which are exempted from employees' social security contributions if held in addition to a main job. Including those jobs leads to higher simulated wage gains in the first decile, but overall findings change only marginally without affecting our conclusions. We therefore continue the following analysis on the basis of the simulation results in Table 1.

4 Employment effects

The employment effects of the minimum wage crucially depend on the associated increase in relative costs for the different labor groups. Assuming that working hours and average labor productivity remain constant within groups, labor costs will increase proportionally to the higher hourly gross wage induced by the minimum wage. Proportionality in the shift of gross wages and wage costs rests on the incidence of employers' social security contributions. As described above, social security contributions (or the wage tax) are more or less paid by employers at a constant rate and would increase labor costs proportionally to the wage if there was no shifting of the wage tax paid by employers onto gross wages. Since a minimum wage would prevent backward-shifting of the wage tax, labor costs would only increase at the same rate as the hourly wage if employers' social security contributions were actually borne by them in the absence of a minimum wage. As there is no convincing evidence in the literature on the incidence of the wage tax, we will work with this incidence

assumption in the following derivation of employment effects.

In Table A3 in the Appendix the simulated wage increases are broken down to the labor types used in the labor demand estimations. The incidence and wage changes obviously depend on the minimum wage level. For a given minimum wage, the highest incidence would be among marginally employed workers who would also experience the highest relative wage increase. For example, between about 50 and 60% of all currently marginally employed men in West and East GErmany would be directly affected by a minimum wage of 8.50 €/hour and the induced increase in the hourly wage would amount to 12% in West Germany and 28% in East Germany. Part-time employed and unskilled women working full-time would also be strongly affected.

In Table 2 the employment effects for different minimum wages are reported which were calculated on the basis of the demand elasticities, the wage changes for each labor type, and three alternative assumptions of the price elasticity of the demand for goods (0, -1, -2). [15]Note that labor demand effects cannot be calculated for highly skilled workers because this group is modeled as a quasi-fixed production factor.

The overall employment effects strongly depend on the assumed level of the minimum wage and the price elasticity of the demand for goods. If the latter was perfectly inelastic, overall labor demand would decrease by about 11,000 persons for a minimum wage of 5.00 €/hour, by 100,000 individuals for a level of 8.50 €/hour, and by 165,000 persons for a level of 10.00 €/hour. In these scenarios the loss of marginal employment would partially be compensated by an increase in demand especially for part-time employed women. If the demand for goods was highly elastic with respect to price changes (assumed elasticity of -2), the overall decrease in demand for labor would amount to about 65,000, 900,000, and 1.8 million persons, respectively. Again the lion's share of employment losses concerns marginal employment. In the simulation with an assumed price elasticity of demand for goods of -1, which we regard the most plausible one for the German economy, the demand for

[15]For various reasons, our estimated employment effects are not directly comparable to those obtained in some of the previous simulation studies for Germany. Most of these studies use older data and refer to a minimum wage of 7.50 €/hour. Some of them simply assume values for labor demand elasticities common to all groups. As shown by Müller (2009), the main reason for differences in simulated employment effects seems to be, however, that some of these studies are based on much larger relative wage changes induced by a minimum wage than we observe in our data.

Table 2: Changes in labor demand (heads) after the introduction of a legal minimum wage, Germany 2013

			MW=5.00 €/hour Output price elasticities			**MW=8.50 €/hour** Output price elasticities			**MW=10.00 €/hour** Output price elasticities		
			0	-1	-2	0	-1	-2	0	-1	-2
Full-time	Skilled	*Women*	-2,768	-8,258	-13,748	-26,755	-109,407	-192,059	-47,115	-218,148	-389,182
		Men	3,321	-6,739	-16,800	39,360	-111,959	-263,277	73,686	-239,542	-552,770
	Unskilled	*Women*	-111	-778	-1,446	-2,041	-12,017	-21,993	-6,479	-27,181	-47,884
		Men	737	-576	-1,890	4,275	-15,423	-35,120	5,615	-35,201	-76,016
Part-time		*Women*	5,481	223	-5,034	46,243	-32,739	-111,720	73,593	-89,969	-253,530
		Men	347	-469	-1,285	5,352	-6,924	-19,200	9,892	-15,520	-40,932
Marginally employed		*Women*	-14,450	-16,352	-18,253	-128,559	-157,070	-185,581	-213,171	-272,258	-331,346
		Men	-3,667	-4,398	-5,129	-38,037	-49,047	-60,058	-61,727	-84,506	-107,285
Total			-11,110	-37,348	-63,586	-100,162	-494,586	-889,009	-165,706	-982,326	-1,798,945

Notes: Own- and cross-wage elasticities taken into account. Demand changes in numbers of employees ('heads').
Qualification categories according to Freier and Steiner (2007, 2010): 'skilled' = secondary-school education or vocational training, 'unskilled' = neither secondary-school education nor vocational training.

Source: Own calculations based on elasticity estimates taken from Freier and Steiner (2007, 2010), SOEP wave 2011.

skilled full-time labor would also shrink considerably due to the strong reduction in the demand for goods. The resulting decrease in labor demand for a minimum wage of 5.00 €/hour amounts to about 37,000 persons, for a minimum wage level of 8.50 €/hour to about 500,000 individuals, and for a level of 10.00 €/hour to 980,000 persons. We use this scenario for the simulation of household incomes that include employment effects in the next section.

5 Average income effects and changes in income inequality

5.1 Average income effects

To what extent are the substantial increases in hourly wages we observe at the bottom of the wage distribution translated into higher net household incomes, and how is this relation affected by employment and price effects induced by the minimum wage? This is answered by Table 3 which shows, in the upper panel, for simulations without and with behavioral effects and alternative levels of the minimum wage the simulated changes in the absolute and relative average amounts of monthly net household income. Second-round effects are reported for simulations with employment effects only and simulations with both employment and price effects.

Table 3 shows the overall share of households affected is 3.5%, 16.3% and about 24.8% for the alternative levels of the minimum wage. Without accounting for employment and price effects, a minimum wage set at 5.00 €/hour would increase net yearly incomes for those households affected by it by only about 80 € (0.2%), on average. When the minimum wage is set at 8.50 €/hour this amount increases to about 900 € (3%), and to about 1350 € (4%) for a level of 10.00 €/hour.

When employment and price effects are not considered the income change would amount to roughly 35 million €/year in total when the minimum is set at 5.00 €/hour. The total sum increases to 3.9 billion €/year and 8.9 billion €/year for minimum wages of 8.50 €/hour and 10.00 €/hour, respectively. The absolute sums are substantially smaller compared to the total increase in the wage bill (see Table 1). The shares of net income gains from the increases in gross wages equal 9% for a minimum of 5.00 €, 41% for a minimum of 8.50 € and 45% for a minimum

Table 3: Minimum wage effects on net incomes of households affected by the minimum wage, 2013

	MW= 5.00 €/hour	**MW= 8.50 €/hour**	**MW= 10.00 €/hour**
Incidence (%)	3.5	16.3	24.8
Avg. income no MW (€/year)	32,827	32,064	32,346
Δ Avg. income with MW			
No behavioral effects (€/year)	81	901	1,356
No behavioral effects (%)	0.2	2.8	4.2
With empl. effects (€/year)	-1	375	498
With empl. effects (%)	0.0	1.2	1.5
With empl. & price effects (€/year)	-318	-245	-221
With empl. & price effects (%)	-1.0	-0.8	-0.7
Δ Total income with MW			
No behavioral effects (mill. €/year)	35	3,923	8,986
With empl. effects (mill. €/year)	-1	1,632	3,299
With empl. & price effects (mill. €/year)	-298	-1,066	-1,466

Notes: Incidence = Households affected by the minimum wage as percentage of all households in each group. Percentage changes of average income refer to households within the respective group, percentage changes of total income are calculated relative to the whole population. Employment status refers to the situation before the introduction of a minimum wage. When accounting for employment effects of a minimum wage a fraction of the employed is simulated to become unemployed according to demand side constraints of Table 2. Wage projections for 2013 are based on average growth rates. Population results are derived using SOEP household weights.

Source: Own calculations based on SOEP, wave 2011.

of 10.00 €/hour. In the first-round simulations the smaller increase in net incomes can be explained by the substitution of means-tested income transfers by higher wage incomes, the loss of means-tested social transfers, and progressive taxation. Since means-tested transfers are related to the presence of children in the household and to the employment status of the spouse, the minimum wage leads to smaller increases of net household income for families with children.[16]

Taking employment effects into account, the average monthly income gain for households affected by the minimum wage is roughly cut by half. For a minimum set at 8.50 €/hour it decreases from about 900 € to 375 € per year. For the low minimum wage level of 5.00 €/hour the income effect becomes even slightly negative because of the negative employment effects. Likewise the total increase in household incomes shrinks considerably. As would be expected, employment losses due to the legal minimum further reduce the modest increases in household incomes substantially.

If the increase in consumer prices induced by the minimum wage is also taken into

[16]Detailed simulation results for different minimum wage levels, household types and region are available from the authors upon request.

account, the change of net incomes becomes negative for all three minimum wage levels. Households affected by the federal minimum wage would, on average, suffer a small overall income loss of 320 €, 245 €, and 220 € per year for the alternative levels of the minimum wage. These simulations assume, however, that households do not adjust their demand for consumption goods to changes in relative consumer prices and real net household income. [17]

5.2 Distributional effects

The effects of the minimum wage on the distribution of household incomes and overall income inequality depend on household composition, the distribution of minimum wage earners across different income levels and the average income changes of affected households at different locations of the income distribution. To account for household composition we calculate net equivalent incomes using the new OECD scale which gives a factor of 1 to the head of household, of 0.5 to each adult person and of 0.3 to each child. Population results are derived using SOEP personal weighting factors adjusted by equivalence weights.

Table 4 shows first-round and second-round distributional effects of a minimum wage of 8.50 €/hour, simulation results for the alternative minimum wage levels are summarized in Tables A5 and A6 in the Appendix. A first interesting result is that the share of persons affected by the minimum wage in the bottom decile of the net equivalent income distribution is substantially smaller than the incidence rates in each of the 2nd-6th deciles. Only in the higher deciles of the distribution does this share decline below the level it obtains in the bottom decile. This pattern holds regardless of the level of the minimum wage. This confirms the international evidence refered to in the Introduction that the minimum wage would not be targeted at poor households.

Not taking into account employment and price effects, net equivalent income would increase for households affected by the minimum wage of 8.50 €/hour by about 650 € per year, or 3%, on average (Table 4). The largest relative increase in

[17] As shown in Müller and Steiner (2010) for a minimum wage of 7.50 €, the negative price effect on net household income may be partly compensated by a reduction in the demand for goods with a relatively high income elasticity. As mentioned in the methodological section, accounting for substitution effects between consumer goods would require detailed demand elasticity estimates which are not available for Germany.

Table 4: Effects of a minimum wage of 8.50 €/hour on net equivalent incomes of households affected, Germany 2013

Decile	**Avg. income no MW** (€/year)	**Affected by MW (incidence)** (%)	**MW: without behavioral effects** Δ avg. income (€/year)	(%)	**MW: with employment effects** Δ avg. income (€/year)	(%)	**MW: with employment & price effects** Δ avg. income (€/year)	(%)
1st	8,910	18.3	909	10.2	450	5.1	-19	-0.2
2nd	12,779	35.1	985	7.7	482	3.8	52	0.4
3rd	15,497	30.7	616	4.0	178	1.1	-114	-0.7
4th	17,948	27.6	655	3.6	267	1.5	-155	-0.9
5th	20,077	20.5	516	2.6	23	0.1	-237	-1.2
6th	22,632	17.3	551	2.4	-36	-0.2	-281	-1.2
7th	25,643	17.6	253	1.0	-42	-0.2	-299	-1.2
8th	29,068	10.8	159	0.5	-18	-0.1	-305	-1.1
9th	34,207	6.7	301	0.9	118	0.3	-324	-0.9
10th	51,304	10.3	365	0.7	72	0.1	-342	-0.7
Average	23,802	19.5	657	2.8	198	0.8	-155	-0.7

Inequality measures	**Status quo: no MW**	(CI)	**MW: without behavioral effects** (Δ)	(%Δ)	**MW: with employment effects** (Δ)	(%Δ)	**MW: with employment & price effects** (Δ)	(%Δ)
Gini coefficient × 100	26.82	(26.11; 27.53)	-0.23	(-0.86)	-0.09	(-0.34)	0.01	(0.04)
Mean log deviation × 100	12.40	(11.71; 13.09)	-0.19	(-1.53)	-0.04	(-0.32)	0.00	(0.00)
Atkinson ($\epsilon = 2$) × 100	25.51	(23.07; 27.96)	-0.25	(-0.98)	0.19	(0.74)	0.04	(0.16)

Notes: Deciles for the distribution of net equivalent incomes are calculated for the wage structure in 2013 (without minimum wage). Incidence = households affected by the minimum wage as percentage of all households within a given decile of the net equivalence income distribution. Δ avg. income = change of average incomes measured in equivalence units for affected households within a given decile. Wage projections for 2013 are based on average growth rates. 95%-confidence bands for the inequality measures are given in parentheses.

Source: Own calculations based on SOEP wave 2011.

average equivalent income amounting to about 10% of net equivalent income would occur in the bottom decile of the income distribution, although the second decile receives the largest absolute income gain of nearly 1000 €/year (8% of this group's net equivalent income in 2013). In relative terms, income gains are monotonically decreasing across the income distribution.

In the simulations that take employment effects into account net equivalent income gains decline considerably: for a minimum wage of 8.50 €/hour the remaining average increase in equivalent income amounts to about 200 €/year (less than 1% of average net equivalence income; see Table 4). Only half of the relative income gain (about 5%) remains in the bottom decile, income gains fall throughout the distribution and the 6th-8th deciles even have to bear small income losses.

When higher prices of consumer goods resulting from the minimum wage are also considered, net household equivalent incomes even decline slightly across the whole income distribution, where the average loss is about 150 €/year for a minimum wage set at 8.50 €/hour. As shown in Tables A5 and A6 in the Appendix, net household incomes would also decline slightly, on average, if a minimum wage was introduced at a lower or higher level. As already mentioned above, this neglects, however, that households may adjust consumption expenditures due to income and substitution effects, which could partly or even fully compensate the direct price effect.

To investigate the potential effects the introduction of a legal minimum wage would have on income inequality, the lower part of Table 4 reports standard summary inequality measures. For the scenario without employment and price effects the *Gini coefficient* does not record any significant change. The bottom-sensitive mean logarithmic deviation (MLD) measure reveals a very small decline in income inequality, which is also recorded by the Atkinson measure assuming a relatively high value for the inequality aversion parameter ($\epsilon = 2$). As Tables A5 and A6 in the Appendix show, this also holds for the two alternative minimum wage levels considered.

6 Conclusion

We have analyzed the effects of the introduction of a nationwide minimum wage on the distribution of disposable household incomes in Germany. On the basis

of individual- and household-level data from the German Socio Economic Panel (SOEP) we simulate wage changes, estimate employment and price effects and incorporate them into a micro-simulation model. This model allows us to account for the complex interactions between individual wages, the tax-benefit system and net household incomes and for second-order employment and price effects induced by the minimum wage. We compare simulations with different levels of the minimum that were suggested in the recent policy debate. Simulation results show that a minimum wage set at not too low levels would induce substantial increases at the bottom of the hourly wage distribution, but would have only a rather limited impact on average net household incomes regardless of the level at which it is set and even abstracting from any behavioral adjustments. This discrepancy can be explained by the substitution of means-tested transfers and progressive income taxation.

The minimum wage becomes even less effective in reducing income inequality when negative employment effects are taken into account. This is illustrated by the smaller differences for the inequality measures compared to simulation results not accounting for negative employment of the minimum wage. The already small redistributive effects of a minimum wage are further reduced or vanish completely when price effects on consumption are also taken into account. In this case, income inequality could even increase due to the introduction of a minimum wage, as indicated by a slight increase in some of the inequality measures. The minimum wage would also not be well targeted at low income households, and would only have negligible effects on income inequality. Therefore, the minimum wage does not seem to be an effective policy instrument for income redistribution in welfare states like Germany.

Although our simulation results rest on several critical assumptions and do not fully take into account general equilibrium effects, we are confident that these limitations do not fundamentally affect our main conclusion because the various mechanisms analyzed in this paper – the tax-and-transfer system, the position of minimum wage earners in the income distribution, employment and price effects – all operate in the same direction and diminish the redistributive efficiency of the minimum wage.

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Appendix

Table A1: Compensated own- and cross-wage elasticities (number of workers)

West Germany	FT,U,M	FT,S,M	PT,M	ME,M	FT, U,W	FT,S,W	PT,W	ME,W
FT, U, M	**-0.510**	0.419	0.003	-0.001	0.050	0.034	-0.048	0.055
FT, S, M	0.085	**-0.200**	0.001	0.004	0.032	0.062	0.002	0.017
PT, M	0.023	-0.001	**-0.070**	-0.110	0.031	-0.268	0.204	0.186
ME, M	-0.019	0.316	-0.246	**-0.130**	-0.093	0.187	0.148	-0.162
FT, U, W	0.108	0.367	0.012	-0.013	**-0.370**	-0.055	-0.081	0.030
FT, S, W	0.020	0.136	-0.014	0.005	-0.009	**-0.160**	0.071	-0.051
PT, W	-0.044	0.007	0.033	0.011	-0.044	0.196	**-0.260**	0.099
ME, W	0.255	0.495	0.144	-0.058	0.056	-0.805	0.483	**-0.570**
East Germany	FT,U,M	FT,S,M	PT,M	ME,M	FT, U,W	FT,S,W	PT,W	ME,W
FT, U, M	**-0.300**	-0.086	-0.076	0.028	-0.036	0.487	-0.008	-0.008
FT, S, M	-0.002	**-0.110**	-0.008	0.005	0.006	0.091	0.015	0.005
PT, M	-0.135	-0.235	**-0.290**	0.006	0.114	0.235	0.302	-0.002
ME, M	0.172	0.476	0.019	**-0.300**	0.152	-0.778	0.332	-0.073
FT, U, W	-0.060	0.099	0.116	0.041	**-0.250**	-0.273	0.237	0.091
FT, S, W	0.044	0.128	0.012	-0.011	-0.014	**-0.230**	0.076	-0.010
PT, W	-0.010	0.063	0.055	0.018	0.040	0.245	**-0.440**	0.032
ME, W	-0.038	0.323	-0.008	-0.053	0.248	-0.582	0.437	**-0.330**

Notes: FT, U, M - Full-time unskilled men; FT, S, M - Full-time skilled men; PT, M - Part-time men; ME, M - Marginally employed men; FT, U, W - Full-time unskilled women; FT, S, W - Full-time skilled women; PT, W - Part-time women; ME, W - Marginally employed women.
Numbers in italics are own-wage elasticities.

Source: Freier and Steiner (2007, 2010).

Table A2: Mean hourly gross wage (in €) with and without a minimum wage of 8.50 €/hour, within first decile of the hourly wage distribution, 2013

	Affected (in %)		**No MW**	**MW**		
	Overall	1st decile	€/hour	€/hour	Δ €	% Δ
Germany overall	12.93	100.00	6.01	8.50	2.49	41.43
Gender & Region						
Men West Germany	7.06	70.72	7.21	8.65	1.44	19.97
Men East Germany	16.85	100.00	5.59	8.50	2.91	52.06
Women West Germany	14.53	100.00	5.69	8.50	2.81	49.38
Women East Germany	24.94	100.00	4.89	8.50	3.61	73.82
Age						
18-25 years	31.27	100.00	5.81	8.50	2.69	46.30
26-35 years	13.43	100.00	6.02	8.50	2.48	41.20
36-45 years	10.54	100.00	6.20	8.50	2.30	37.10
46-55 years	10.15	100.00	6.10	8.50	2.40	39.34
56-65 years	12.68	100.00	5.79	8.50	2.71	46.80
Qualification						
High	5.74	100.00	6.04	8.50	2.46	40.73
Medium	13.70	100.00	6.00	8.50	2.50	41.67
Low	21.36	100.00	6.02	8.50	2.48	41.20
Employment status						
Employed full-time	8.05	100.00	6.27	8.50	2.23	35.57
Employed part-time	15.98	100.00	6.16	8.50	2.34	37.99
Marginally employed	45.66	100.00	5.58	8.50	2.92	52.33
Firm size						
$<$ 5 employees	22.93	100.00	5.65	8.50	2.85	50.44
5-10 employees	20.58	100.00	6.06	8.50	2.44	40.26
11-20 employees	18.03	100.00	6.13	8.50	2.37	38.66
21-100 employees	13.27	100.00	6.14	8.50	2.36	38.44
101-200 employees	9.86	100.00	6.43	8.50	2.07	32.19
201-2000 employees	7.34	100.00	6.17	8.50	2.33	37.76
$>$ 2000 employees	5.34	100.00	5.99	8.50	2.51	41.90
Missing, not assignable	33.41	100.00	6.68	8.50	1.82	27.25

Notes: Wage data for 2010 are extrapolated to 2013 using average growth rates (see text), weighted using SOEP personal sample weights to obtain population means.

Source: Own calculations based on SOEP, wave 2011.

Table A3: Changes in wages after the introduction of a legal minimum wage, 2013

			MW=5.00 €/hour				MW=8.50 €/hour				MW=10.00 €/hour			
			Affected (%)	No MW (€/hour)	MW (Δ €)	MW (Δ %)	Affected (%)	No MW (€/hour)	MW (Δ €)	MW (Δ %)	Affected (%)	No MW (€/hour)	MW (Δ €)	MW (Δ %)
West Germany														
Full-time	Skilled	*Women*	0.44	16.39	0.01	0.03	6.40	16.39	0.09	0.53	14.08	16.39	0.24	1.45
		Men	0.58	19.87	0.00	0.02	4.20	19.87	0.08	0.41	7.27	19.87	0.17	0.86
	Unskilled	*Women*	3.44	13.71	0.03	0.25	16.70	13.71	0.34	2.50	29.88	13.71	0.72	5.22
		Men	0.61	16.85	0.01	0.05	12.49	16.85	0.22	1.31	19.40	16.85	0.46	2.76
Part-time		*Women*	2.15	15.83	0.02	0.10	12.88	15.83	0.26	1.66	21.91	15.83	0.53	3.33
		Men	1.95	16.21	0.02	0.13	17.37	16.21	0.31	1.92	31.72	16.21	0.66	4.08
Marginally employed		*Women*	11.34	10.29	0.10	1.01	42.75	10.29	1.09	10.57	56.07	10.29	1.89	18.40
		Men	6.44	11.40	0.11	0.93	47.78	11.40	1.34	11.75	57.41	11.40	2.30	20.17
Total			2.28	15.07	0.04	0.25	11.83	15.07	0.47	3.10	18.35	15.07	0.87	5.78
East Germany														
Full-time	Skilled	*Women*	2.84	12.77	0.02	0.19	25.11	12.77	0.42	3.31	33.42	12.77	0.88	6.89
		Men	2.24	13.88	0.01	0.11	17.00	13.88	0.29	2.08	29.71	13.88	0.64	4.63
	Unskilled	*Women*	2.45	15.25	0.01	0.05	20.13	15.25	0.35	2.27	28.03	15.25	0.69	4.55
		Men	2.22	14.61	0.01	0.05	20.81	14.61	0.27	1.83	28.53	14.61	0.64	4.41
Part-time		*Women*	3.07	13.64	0.03	0.25	26.64	13.64	0.47	3.46	37.37	13.64	0.96	7.05
		Men	10.06	12.65	0.11	0.90	21.83	12.65	0.73	5.73	31.20	12.65	1.18	9.30
Marginally employed		*Women*	24.35	9.78	0.31	3.14	49.54	9.78	2.03	20.78	55.18	9.78	3.05	31.18
		Men	15.83	7.93	0.21	2.66	60.77	7.93	2.25	28.33	64.40	7.93	3.44	43.32
Total			4.14	12.57	0.09	0.72	22.17	12.57	0.85	6.77	32.23	12.57	1.44	11.43

Notes: Qualification categories according to Freier and Steiner (2007, 2010): 'skilled' = secondary-school education or vocational training, 'unskilled' = neither secondary-school education nor vocational training.

Source: Own calculations based on SOEP wave 2011.

Table A4: Heterogeneity of minimum wage effects (MW=8.50€/hour) on net incomes of households affected by the minimum wage, 2013

	Overall			Couples					Singles		
	Total	No children	With children	Total	No children	With children	Both work	One works	Total	No children	With children
Incidence (%)	16.3	12.3	23.6	22.2	17.2	26.5	26.2	15.5	11.9	10.2	18.3
Avg. income no MW (€/year)	32,064	22,551	41,205	42,710	35,227	46,888	45,683	31,548	17,393	13,233	25,902
Δ Average income											
No behavioral effects (€/year)	901	1,133	679	871	1,117	734	937	615	943	1,145	529
No behavioral effects (%)	2.8	5.0	1.6	2.0	3.2	1.6	2.1	1.9	5.4	8.7	2.0
With employment effects (€/year)	375	609	150	290	573	132	293	264	491	636	195
With employment effects (%)	1.2	2.7	0.4	0.7	1.6	0.3	0.6	0.8	2.8	4.8	0.8
With employment & price effects (€/year)	-245	-154	-332	-441	-336	-500	-457	-386	25	-20	119
With employment & price effects (%)	-0.8	-0.7	-0.8	-1.0	-1.0	-1.1	-1.0	-1.2	0.1	-0.2	0.5
Δ Total income											
No behavioral effects (mill. €/year)	3,923	2,416	1,506	2,197	1,009	1,188	1,878	171	1,725	1,407	318
With employment effects (mill. €/year)	1,632	1,300	332	733	518	214	587	73	899	782	117
With employment & price effects (mill. €/year)	-1,066	-328	-737	-1,112	-303	-809	-917	-107	46	-25	71

Notes: Incidence = Households affected by the minimum wage as percentage of all households in each group. Percentage changes of average income refer to households within the respective group, percentage changes of total income are calculated relative to the whole population. Employment status refers to the situation before the introduction of a minimum wage. When accounting for employment effects of a minimum wage a fraction of the employed is simulated to become unemployed according to demand side constraints of Table 4. Wage projections for 2013 are based on average growth rates.

Source: Own calculations based on SOEP, wave 2011.

Table A5: Effects of a minimum wage of 5.00 €/hour on net equivalent incomes of households affected, Germany 2013

Decile	**Avg. income no MW** (€/year)	**Affected by MW (incidence)** (%)	**MW: without behavioral effects** Δ avg. income (€/year)	(%)	**MW: with employment effects** Δ avg. income (€/year)	(%)	**MW: with employment & price effects** Δ avg. income (€/year)	(%)
1st	8,910	5.1	263	3.0	192	2.2	-49	-0.6
2nd	12,779	8.9	165	1.3	142	1.1	-82	-0.6
3rd	15,497	5.1	23	0.1	-40	-0.3	-178	-1.2
4th	17,948	6.5	48	0.3	-152	-0.8	-228	-1.3
5th	20,077	4.3	-83	-0.4	-114	-0.6	-247	-1.2
6th	22,632	3.2	-294	-1.3	-297	-1.3	-332	-1.5
7th	25,643	3.2	-27	-0.1	-40	-0.2	-236	-0.9
8th	29,068	2.9	-47	-0.2	-53	-0.2	-313	-1.1
9th	34,207	1.5	58	0.2	-12	0.0	-272	-0.8
10th	51,304	3.4	39	0.1	45	0.1	-318	-0.6
Average	23,802	4.4	73	0.3	-12	-0.1	-196	-0.8

Inequality measures	**Status quo: no MW**	(CI)	**MW: without behavioral effects** (Δ)	(%Δ)	**MW: with employment effects** (Δ)	(%Δ)	**MW: with employment & price effects** (Δ)	(%Δ)
Gini coefficient × 100	26.82	(26.11; 27.53)	-0.01	(-0.04)	0.00	(0.00)	0.04	(0.15)
Mean log deviation × 100	12.40	(11.71; 13.09)	-0.01	(-0.10)	-0.01	(-0.08)	0.00	(0.00)
Atkinson ($\epsilon = 2$) × 100	25.51	(23.07; 27.96)	-0.03	(-0.12)	-0.01	(-0.04)	0.06	(0.24)

Notes: Deciles for the distribution of net equivalent incomes are calculated for the wage structure in 2013 (without minimum wage). Incidence = households affected by the minimum wage as percentage of all households within a given decile of the net equivalence income distribution. Δ avg. income = change of average incomes measured in equivalence units for affected households within a given decile. Wage projections for 2013 are based on average growth rates. 95%-confidence bands for the inequality measures are given in parentheses.

Source: Own calculations based on SOEP wave 2011.

Table A6: Effects of a minimum wage of 10.00 €/hour on net equivalent incomes of households affected, Germany 2013

Decile	**Avg. income no MW** (€/year)	**Affected by MW (incidence)** (%)	**MW: without behavioral effects** Δ avg. income (€/year)	(%)	**MW: with employment effects** Δ avg. income (€/year)	(%)	**MW: with employment & price effects** Δ avg. income (€/year)	(%)
1st	8,910	22.2	1,182	13.3	561	6.3	-5	-0.1
2nd	12,779	48.2	1,529	12.0	647	5.1	111	0.9
3rd	15,497	45.3	1,245	8.0	396	2.6	-59	-0.4
4th	17,948	39.7	942	5.3	195	1.1	-177	-1.0
5th	20,077	34.8	771	3.8	49	0.2	-232	-1.2
6th	22,632	31.9	797	3.5	126	0.6	-212	-0.9
7th	25,643	24.8	510	2.0	62	0.2	-267	-1.0
8th	29,068	18.9	357	1.2	-99	-0.3	-411	-1.4
9th	34,207	13.3	379	1.1	4	0.0	-380	-1.1
10th	51,304	13.4	569	1.1	128	0.2	-344	-0.7
Average	23,802	29.3	999	4.2	262	1.1	-148	-0.6

Inequality measures	**Status quo: no MW**	(CI)	**MW: without behavioral effects** (Δ)	(%Δ)	**MW: with employment effects** (Δ)	(%Δ)	**MW: with employment & price effects** (Δ)	(%Δ)
Gini coefficient × 100	26.82	(26.11; 27.53)	-0.46	(-1.72)	-0.12	(-0.45)	-0.01	(-0.04)
Mean log deviation × 100	12.40	(11.71; 13.09)	-0.35	(-2.82)	-0.02	(-0.16)	0.00	(0.00)
Atkinson ($\epsilon = 2$) × 100	25.51	(23.07; 27.96)	-0.40	(-1.57)	0.50	(1.96)	0.03	(0.12)

Notes: Deciles for the distribution of net equivalent incomes are calculated for the wage structure in 2013 (without minimum wage). Incidence = households affected by the minimum wage as percentage of all households within a given decile of the net equivalence income distribution. Δ avg. income = change of average incomes measured in equivalence units for affected households within a given decile. Wage projections for 2013 are based on average growth rates. 95%-confidence bands for the inequality measures are given in parentheses.

Source: Own calculations based on SOEP wave 2011.