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Does a Wealth Tax Improve Equality of Opportunity? Evidence from Norway

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Abstract

Does parental wealth inequality impact next generation *labor* income inequality? And does a tax on parental wealth affect the labor income distribution of the next generation? We tackle both questions empirically using detailed intergenerational data from Norway, focusing on effects on wages rather than capital income. Results suggest that a net wealth of NOK 1 million increases wages of the children by NOK 14,000. Children of wealthy parents also have a higher labor income mobility. The estimated hypothetical wage distribution without the wealth tax is more unequal. Moreover, suggestive evidence indicates parental wealth is associated with higher labor risk taking.

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I Introduction

At the heart of the current debate about sharp and increasing wealth inequality is its potential impact on income inequality in the next generation—an aspect reflecting equality of opportunity.[1] If children of wealthy parents are not only more likely to earn higher capital income—as suggested in the literature[2]—but also higher *labor* income than peers from less wealthy families with otherwise similar characteristics, then parental wealth entails a privilege that reduces equal prospects of earning income. In this sense, a causal effect of parental wealth on intergenerational wages and labor income mobility reflects better opportunities created by the stock of parental wealth.

The debate on wealth inequality has triggered a strong interest in—and a growing recent literature on—wealth taxation. Thus far, however, the literature has not provided evidence regarding the question: does a tax on parental wealth affect the *labor* income distribution of the next generation? Arguably, it is a challenging question to answer, not least in face of demanding data requirement to establish links between parental wealth, children income when grown up, and a real-world wealth tax.

This paper empirically studies the effects of parental wealth, and its taxation during childhood, on adult income in Norway. The wealth tax in Norway—currently one of the few wealth taxes in the world—has a relatively broad coverage, providing the advantage of studying a wide spectrum of taxpayers beyond the superrich.[3] Our research design focuses on cohorts born during 1978-1980 and estimates the effect of taxing the wealth of their parents in the late 1990s (i.e., when they were at advanced stages in school) on their income in 2013-2017 (i.e., during adulthood). We focus on three outcomes for these cohorts: i) the level of wage; ii) the position on the labor income distribution; and iii) position on the labor income distribution relative to that of their parents—a measure of intergenerational income mobility.

The identification of the causal effect of parental wealth on the income of the children relies on two sources of variation: i) changes to the wealth tax rate in the late 1990s and early 2000s; and, importantly, ii) different levels of taxation of the same level of wealth, depending on the marital status. Specifically, we exploit that the wealth tax threshold and deduction of a married couple filing jointly were higher than that for single filers with the same level of wealth. Thus, we estimate an IV model using tax changes (due to marital status differences and tax law changes) as an instrument for changes in net parental wealth.[4] To address potential concerns about the

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[1]See, e.g., Piketty and Zucman (2014), Smith et al. (2020), and Boserup et al. (2018).
[2]Fagereng et al. (2021)
[3]See Scheuer and Slemrod (2020).
[4]A similar strategy was used in Jakobsen et al. (2020) who focus on the elasticity of capital with respect to the abolished Danish wealth tax.

exclusion restriction (including the possibility that divorce can directly affect future income of the children), we separately estimate the direct divorce effect on the income of the children from a sample of taxpayers that are out of the scope of the wealth tax throughout the entire sample period, and adjust our IV estimation accordingly. As we will explain later, this strategy plausibly provides an upper bound of the divorce effect.

Our analysis yields two main results, consistent across the three considered outcome variables and different rich sets of covariates to control for potential omitted variables bias. First, those who grow up in families with higher levels of net wealth tend to have higher labor incomes, controlling for the education and incomes of their parents as well as individual characteristics including education. The benchmark estimates suggest that a net wealth of 1 million USD in Norway increases future annual wages of the children by 14,000 USD, ceteris paribus. Second, based on these point estimates, we estimate the counterfactual income distribution in 2017, in our sample, in the absence of the wealth tax to answer the question: What would have happened to the labor income distribution today had Norway not implemented a wealth tax in the late 1990s and early 2000s? Our results suggest that the wealth tax has made the labor income distribution less unequal—lowering the Gini coefficient by about 1 point. Moreover, results suggest that the intergenerational *labor* income mobility is influenced by the stock of parental wealth, with children from more wealthy families experiencing higher labor income mobility than those from less wealthy families.

Extending the analysis to account for heterogeneous effects across wealth levels suggests that the impact of the wealth tax on the labor income of the children is higher at middle levels of wealth. Intuitively for the superrich, capital income plays a key role diminishing the importance of employment income whereas low levels of parental wealth do not appear to significantly increase the chances of improving the children position on the labor income distribution.

The questions as to how much and how (if at all) the income distribution should be made more equal require normative analysis as, ultimately, optimal redistribution polices are dependent on society's preferences and the social welfare function. The positive analysis in our study, however, does inform policymakers by providing empirical evidence that a wealth tax is one policy instrument that can lower the next generation income inequality.

Our paper leaves it for future research to closely study mechanisms through which the parental stock of wealth impacts the labor income of their children. However, we do provide empirical evidence pointing to directions for further research. Our results mute a potential education channel as we control for higher education and the field of the study of the children.[5] This prompts us to

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[5]Note also that affordability and access to high quality education is facilitated by the public education system in

think of further mechanisms beyond human capital formation. We provide first empirical evidence suggesting that one of those mechanisms is the risk profiles of decisions related to labor income. For example, wealth can act as a private safety net. Results indicate heterogeneous returns to labor, as higher levels of parental wealth are associated with a higher dispersion of labor income after controlling for individual and parents' characteristics. This finding complements recent evidence on heterogeneous returns to capital as one explanation of intergenerational correlation in wealth levels (Fagereng et al. (2021) and Benhabib and Bisin (2018)). In this context, our results explicitly point to the role of the heterogeneity of labor income (in addition to capital income), associated with different levels of parental wealth, in driving heterogeneous total wealth returns.

Our study links three strands of literature. The first is the empirical literature on wealth taxation, which—as surveyed in Scheuer and Slemrod (2021)—mainly looks at two broad aspects: i) the real effects of a wealth tax on capital accumulation (e.g., Jakobsen et al. (2020)); and ii) behavioral (mostly evasion) responses as well as the revenue potential of various wealth tax designs (e.g., Saez and Zucman (2019); Seim (2017); Bjørneby et al. (2020)). Secondly, a strand of the literature looks at intergenerational or regional income mobility but with a focus on describing patterns in the data without linking them to a wealth tax (e.g., Chetty, Hendren, Kline, Saez, and Turner (2014); Corak (2013); Lee and Solon (2009); and Thoresen (2009)). Finally, a related growing literature studies specific mechanisms of inequality of opportunity. For example, a series of papers—including Chetty et al. (2020), Chetty, Hendren, Kline, and Saez (2014), and Chetty et al. (2018)—relate the distribution of students' earnings in their thirties to their parents' *incomes*. They document, inter alia, that low- and middle-income students attend selective schools at much lower rates than their peers from higher-income families with the same test scores, but those that attend these schools have similar long-term outcomes. This suggests that college attendance patterns have an upward effect on income mobility.

This paper proceeds as follows. Section II summarizes the Norwegian wealth tax during the sample period. Section III presents the identification approach. Section IV discusses the results. Section V concludes.


Norway.

II   Norwegian Wealth Tax and Data

A   Norwegian Wealth Tax

Today, Norway is one of a few OECD countries that levies a tax on the net wealth of individuals.[6] The marginal wealth tax rate has varied considerably over time from a three-step progressive rate in the mid-90s—reaching a rate of 1.5 percent—to a flat rate from the early 2000s—currently set at 0.85 percent (left panel of Figure 1). One specific feature in the Norwegian wealth tax is its relatively low threshold, implying a significant number of taxpayers. The tax threshold currently is a net wealth above NOK 1.5 million (about USD 174,000)—which is doubled for married couples—compared to NOK 125,000 and NOK 150,000 for singles and married couples, respectively, in the early 1990s. In 1993, about 18 percent of Norwegian taxpayers were subject to the wealth tax, while in 2017 the number had dropped to 10 percent.[7]

Figure 1: *Wealth Tax Rates and Payments*

(a) *Top Marginal Wealth Tax Rate*   **(b)** *Tax Payments: Married vs Unmarried*
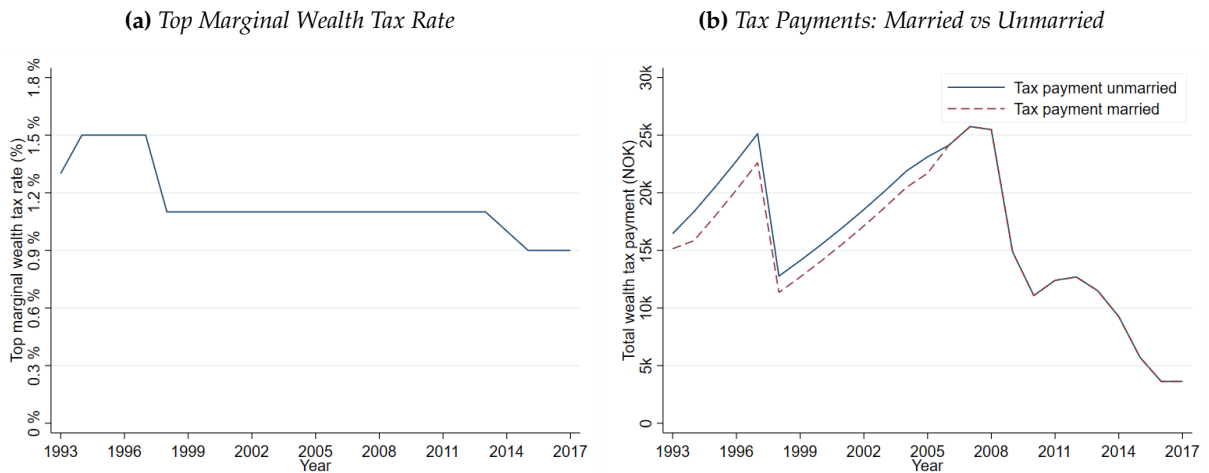
To illustrate differences in taxing the wealth based on marital status in the 1990s and early 2000s, the right panel of Figure 1 shows tax payments over time for married and unmarried couples that have the same the level of equally distributed wealth. For illustration, couples start with NOK 500,000 in 1993 (roughly USD 40,000 using 1993 exchange rate) and we increase the wealth at a predetermined rate of 5 percent annually. Figure 1 displays larger differences in tax payments between married and unmarried parents before 2006, which we exploit in our identification strategy

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[6]The Norwegian wealth tax was introduced in 1892. Currently, in OECD countries, in addition to Norway, e.g., Switzerland and Spain have a wealth tax. Ongoing discussions about a wealth tax are taking place in several countries including the United States, Argentina, and South Africa.

[7]See Bjørneby et al. (2020) and Ring (2020) for detailed descriptions of the Norwegian wealth tax.

B   Data

The source of the data is Statistics Norway's databases including the Income Statistics for Families and Persons which contains the Register of Tax Returns and other detailed information on individuals, enabling us to link parents with their children and trace their different sources of income and their net wealth since 1993. Moreover, the database contains information about education levels, including the field of study, the place of birth, and other characteristics. The Appendix describes the definitions of all variables and presents detailed descriptive statistics in the sample distinguishing between married and unmarried taxpayers (Tables A.2, A.3, and A.4). In 1993, the average net financial wealth was 85 percent of the average wage. By 2017, the average net financial wealth had risen to 135 percent of the average wage. Unsurprisingly, wealth is concentrated at the top 10 percent wealthiest owned about half of all (positive) net wealth in Norway in 2017.

Figure 2 visualizes the main finding of the paper. It presents graphical evidence showing the correlation between parental wealth in 1993-1999 and the percentiles of the income distribution of the children in 2013-2017. The correlation patterns are estimated separately for wages and capital income, controlling for characteristics including: parental wages in 1993-1999, birth in an urban area, age of the wage earner, age and education of the parents. Figure 2 shows that high parental wealth—during childhood—is associated with a better position in the labor income distribution when grown up. Furthermore, confirming existing studies in the literature, the upward slopping relationship is also observed between parental wealth and capital income.

Figure 2: *Parental Wealth, Wage, and Capital Income*
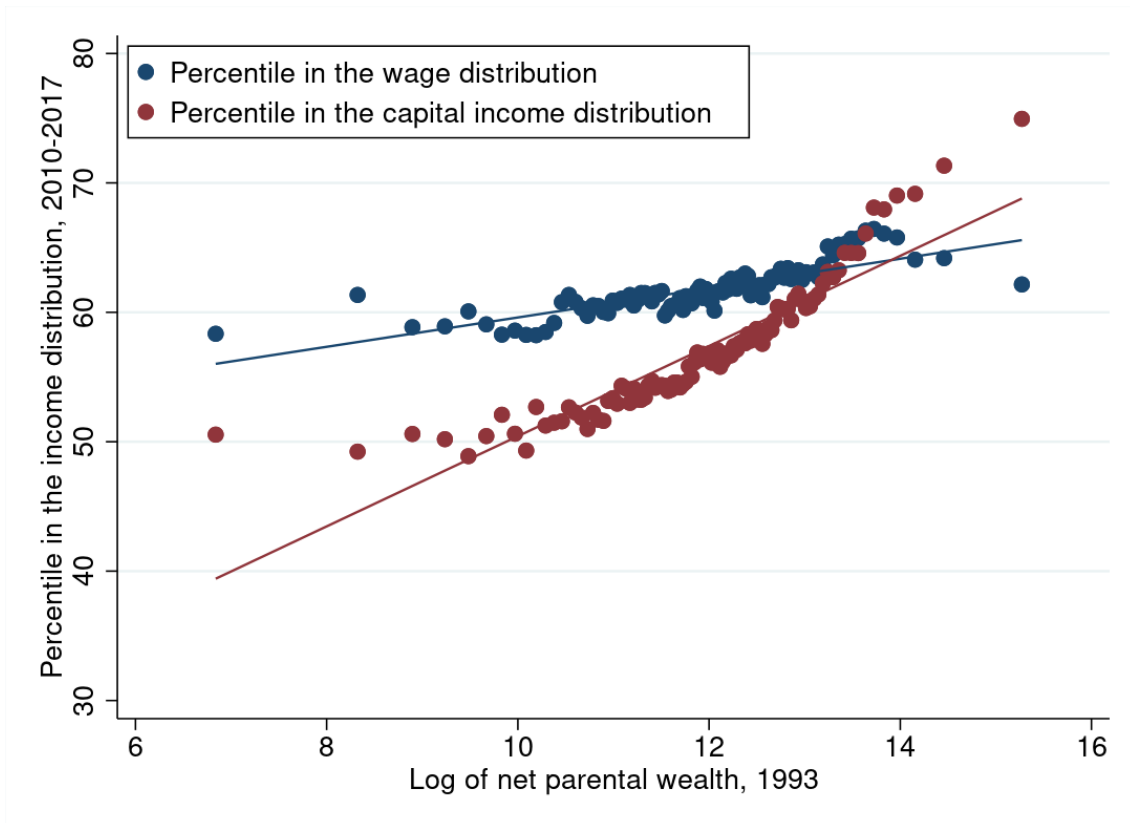
Note: The binned scatterplot shows the estimated relationship between net parental wealth in 1993 and the position on the labor income or capital income distribution in 2010-2017, controlling for parents and individual's characteristics including education.

III Empirical Approach

A IV Estimation and Clarifying the Potential Bias

The main identification strategy is to compare wage outcomes of children of married, unmarried, and divorced parents over time. These groups were taxed differently on their wealth throughout the 1990s and early 2000s. Furthermore, we explicitly account for a potential direct effect of divorce on the income of the children.

Let Y_i be the outcome (wages), X_i is the stock of parental wealth during childhood, Z_i is the instrument (parental divorce) and C_i is a confounder (unobserved variable that affects wages and is related to parental wealth). For illustrating the main point, we can safely drop the time dimension here. Assume random assignment of Z_i, which in our context means that divorce is unrelated to C_i

(i.e., Z_i and C_i are independent), the second stage equation is

$$Y_i = \alpha + \beta X_i + \epsilon_i, \tag{1}$$

where the error term is

$$\epsilon_i = \delta Z_i + \phi C_i. \tag{2}$$

The *exclusion restriction* is that $\delta = 0$, which may not hold if parental divorce directly affects earnings of the children when grown up (and we account for this possibility as described below). The first-stage is

$$X_i = \theta + \gamma Z_i + \sigma_i, \tag{3}$$

where σ_i contains all factors that affect parental wealth other than divorce. Using 2SLS, we obtain $\hat{X}_i = \hat{\theta} + \hat{\gamma} Z_i$ from the first stage estimation, and next the IV-estimator replaces X_i by $\hat{X}_i$.

The *instrument relevance* holds if $\gamma \neq 0$, and the IV-estimator $\hat{\beta}^{IV} = c\hat{o}v(Y_i, Z_i)/c\hat{o}v(X_i, Z_i)$ is then

$$\hat{\beta}^{IV_1} = \frac{c\hat{o}v\left(\beta(\hat{\theta} + \hat{\gamma}Z_i) + \delta Z_i + \phi C_i, Z_i\right)}{\hat{\gamma}v\hat{a}r\left(Z_i\right)} = \beta + \frac{\delta}{\hat{\gamma}} + \frac{c\hat{o}v\left(\phi C_i, Z_i\right)}{\hat{\gamma}v\hat{a}r\left(Z_i\right)} = \beta + \frac{\delta}{\hat{\gamma}}, \tag{4}$$

where the last step follows from random assignment.

Thus, is $\delta < 0$ and $\gamma < 0$ then $\beta^{IV} = \beta + b$, and $b > 0$ is the bias. Hence, to relax a priori assumption $\delta = 0$, we estimate δ to correct for the potential bias in the IV estimator of the causal effect of parental wealth on wages of the children.

B   Accounting for the Potential Bias

We estimate δ from a sample of individuals with wealth below the tax threshold, which means divorce does not affect their tax payments at all. The estimation equation of the direct effect of divorce is:

$$Y_j = \alpha + \beta X_j + \delta Z_j + \epsilon_j. \tag{5}$$

Under random assignment, the OLS estimator $\hat{\delta}$ identifies δ, allowing us to difference out the direct effect of Z_i on Y_i.

The adjusted second stage in the IV estimator is:

$$Y_i^{pred} = Y_i - \hat{\delta}Z_i = \alpha + \beta X_i + \theta C_i, \tag{6}$$

where Y_i^{pred} is the variation in Y_i that remains after accounting for the direct effect of Z_i. If δ is equal across samples, such that $Y_i^{pred} = Y_j^{pred}$, then $\hat{\delta}$ is an unbiased estimate of the true δ in our sample

of interest. Hence, using the corrected values, Y_i^{pred}, the IV-estimator now identifies β:

$$\hat{\beta}^{IV_2} = \frac{cov\left(\beta(\hat{\theta} + \hat{\gamma}Z_i) + \phi C_i, Z_i\right)}{\hat{\gamma}\,var\left(Z_i\right)} = \beta. \tag{7}$$

If $\hat{\delta}$ is larger for the low parental wealth sample, which is a plausible assumption, then our strategy identifies an upper bound estimate of the divorce effect on income of the children—although this assumption is not needed for the validity of our adjustment.

C Specifications

OLS and IV

Our sample includes three cohorts born during 1978-1980, who are 14-16 years old in 1993, 19-21 in 1998 and 38-40 in 2017. Individual i at time t has wage $wage_{i,t}$ and parents p with total net wealth $netwealth_{p,t}$. The OLS specification is:

$$wage_{i,t} = \alpha_t + \beta\,netwealth_{p_i,1998} + \gamma\,netwealth_{p_i,1993} + \theta\,controls_{p_i,1993} + \delta\,controls_i + \epsilon_{i,t}, \tag{8}$$

where $controls_{p,1993}$ is a vector of characteristics of the parents including wage, education, age, and marital status in $t - 20$; $controls_i$ is another vector of characteristics of the individual including the age and whether the individual is born outside of Norway; α_t are year-dummies; and $\epsilon_{i,t}$ are error terms.

However, as described above, since net parental wealth may be associated with unobservable features of each family, we also instrument $netwealth_{p_i,1998}$ by the change in wealth tax payments, which occurs because of changes in tax rules while holding individual wealth, income and marital status constant. $\Delta taxpayment_{p_i,t} = taxrule_t(netw_{p_i,1993}) - taxrule_{1993}(netw_{p_i,1993})$, where $taxrule_t$ are the tax rules for net wealth in each year. Increase in tax payments due to changes in the rules reduce net wealth in 1998, conditional on net wealth in 1993. The difference taxation of the same level of wealth drives from different tax treatments based on marital status and changes to the marital status. Hence, the IV specification is

$$wage_{i,t} = \alpha_t + \beta\left(netwealth_{p_i,1998} = \Delta taxpayment_{p_i,1998}\right) + \gamma\,netwealth_{p_i,1993} +$$
$$\eta\,marriage_{p_i,1993} + \theta\,controls_{p_i,1993} + \delta\,controls_i + \epsilon_{i,t}. \tag{9}$$

Moreover, we control for the marital status of the parents in 1993. Hence, importantly, in this specification the only source of variation in the tax treatment of the same level of wealth is divorce

(since we condition on both parents being alive in 1998). Furthermore, we control for the initial wealth levels of the parents, such that we estimate the effect of changes in parental wealth due to exogenous tax changes and their impact on wages 19 years later.

Instrument Relevance and Validity

The effect of exogenous changes in parental net wealth, β, is identified if the change in tax payments affect net parental wealth in 1998 (relevance) and is unrelated to wages other than through net wealth in 1998 (exclusion). As reported in Table A.5 in the Appendix, the $F-$statistics and R^2 form the first stage regressions support the relevance of the instrument passing the Stock-Yogo cutoffs.

As discussed above, to address concerns that the exclusion restriction may not hold, we employ a differences-in-differences design. The approach is to estimate the effect of parental divorce on wages of the children for those that not subject to the wealth tax, and use these estimates to adjust our the IV estimator as follows:

$$wage_{i,t} = \alpha_t + \xi \, divorce_{p_i,1998} + \beta \, netwealth_{p_i,1998} + \gamma \, netwealth_{p_i,1993} + \\ \eta \, marriage_{p_i,1993} + \theta \, controls_{p_i,1993} + \delta \, controls_{\underline{i}} + \epsilon_{\underline{i},t}, \tag{10}$$

where $divorce_{p_i,1998}$ is a dummy that is equal to one when the parents divorce in the period 1994-1998 and zero otherwise. $\underline{i}$ is an individual with parental wealth between NOK $-50,000$ and NOK $50,000$ during 1993-1998, whereas $\bar{i}$ are individuals above NOK $50,000$. The estimation results are reported in Table A.6 in the appendix.

Next, we linearly predict wages from (based on the estimation results from Equation 10), for all levels of parental wealth. This predicted wage is then subtracted from the original wage for $i = \bar{i}$, obtaining $w\hat{a}ge_{\bar{i},t}$:

$$w\hat{a}ge_{\bar{i},t} = \alpha_t + \beta \left(netwealth_{p_i,1998} = \Delta \, taxpayment_{p_i,1998} \right) + \gamma \, netwealth_{p_i,1993} + \\ \eta \, marriage_{p_i,1993} + \theta \, controls_{p_i,1993} + \delta \, controls_{\bar{i}} + \epsilon_{\bar{i},t}. \tag{11}$$

To summarize, if the direct effect of divorce on wages of the children is independent of parental wealth, our approach identifies the effect of exogenous changes in parental wealth on wage outcomes. If instead the direct effect is higher at lower levels of wealth, then our approach to account for it is using an upper-bound estimate of the direct effect (thereby lowering the wages of children of divorced parents that pay the wealth by the same amount as for those that do not pay the wealth tax). Hence, in this case, the true effect for the wealthy is between our non-adjusted and adjusted approaches.

Other Outcome Variables

In addition to the levels of wage of the children, we consider two other dependent variables: i) The position of the child in the wage distribution (percentiles). This variable is particularly suitable for our IV strategy because it is unlikely that divorce directly affects the *percentile* in the wage distribution of the children of parents with wealth *more than* children with low parental wealth; ii) A measure of intergenerational income mobility defined as the child position on the wage distribution relative to the parents.

IV   Results

A   Main results

Table 1 shows our main results. In columns 1-3, the variable of interest is total net wealth of the parents. The first column displays OLS estimation results whereas the second column shows the IV estimation results without adjusting for the direct divorce effect on children income. Column 3 adjusts the IV model for this effect as described in Section 3. The dependent variable in the first row is the level of wages. The OLS yields the highest estimate suggesting that a net parental wealth of USD 1 million in Norway increases future labor income of the children by USD 27,100. The IV and adjusted IV estimates are somewhat smaller at USD 16,700 and USD 14,000 respectively. The adjusted-IV point estimate is only slightly smaller than the IV indicating to a relatively low potential bias from a violation of the exclusion restriction. Columns 4-6 repeat columns 1-3 but using only the net *financial* wealth of the parents. Estimates are rather similar ranging from USD 25,500 (OLS), USD 17,900 (IV), to USD 10,100 (adjusted IV).

In the second row of Table 1, the dependent variable is the percentile of the child on the wage distribution. All estimation methods suggest that a net parental wealth has a positive impact on the position of the child on the labor income distribution, with the OLS yielding the highest effect and the adjusted IV yielding the lowest effect. The third row shows the results for the intergenerational income mobility measure as the dependent variable. Again, the three estimation models give the same finding that net parental wealth has a positive effect on the income of the child relative to the income of the parents. Redoing the analysis using total income instead of wages yields higher estimates (see Appendix, Table A.7), which is intuitive as wealth generates also capital income.

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Table 1: *Main Results*

Estimator	OLS	IV	Adjusted IV	OLS	IV	Adjusted IV
Effect of	Net parental wealth			Parental financial wealth		
On wage level	0.00271***	0.0167***	0.0140***	0.00255***	0.0179***	0.0101***
	(0.000356)	(0.00121)	(0.00119)	(0.000395)	(0.00124)	(0.00103)
On wage percentile	0.000208***	0.00135***	0.00113***	0.000218***	0.00145***	0.000745***
	(0.0000276)	(0.000104)	(0.000107)	(0.0000333)	(0.000105)	(0.000890)
On wage mobility	0.000649***	0.00317***	0.00295***	0.000633***	0.00335***	0.00206***
	(0.0000638)	(0.000180)	(0.000191)	(0.0000869)	(0.000190)	(0.000158)
Sample restrictions	0<PW	0<PW	200<PW	0<PW	0<PW	200<PW
N	480,971	480,971	270,995	480,971	480,971	270,995

Standard errors in parentheses. * $p < 0.10$, ** $p < 0.05$, *** $p < 0.01$. All monetary amounts are measured in NOK 1000. PW is net parental wealth divided by the number of siblings in 1993. The first 3 columns show the effects of the change in net parental wealth from 1993 to 1998 instrumented by the wealth tax change. Columns 4 to 6 show the effects for the change in parental net financial wealth from 1993 to 1998 instrumented by the wealth tax change. All estimation include controls and results are shown in the Appendix. Controls include wages, education and age of father and mother, parental wealth and marital status in 1993, whether the individual earns mainly capital income, age, whether the individual is born in an urban area, and year dummies. Mobility outcomes are measured in percentiles from father's wage income in 1993 to children's wage income in 2010-2017.

All reported specifications control for characteristics of the parents, including wages, education levels, marital status, and ages. Regarding individuals, controls include age, a dummy for being born in an urban area, and whether earning is mainly capital income. Unsurprisingly, education of the parents is positively associated with wages of the children. The Appendix reports the full results for the controls (Table A.8).

Figure 3 presents the estimated counterfactual distribution of wages in the absence of the Norwegian wealth tax, based on Equation 11 and corresponding to the estimates in column 3 of Table 1. We compute the Gini coefficients of the counterfactual and observed distributions of wages, and find that the latter is less unequal with a Gini coefficient of close 0.24 compared to the counterfactual Gini coefficient in the our sample close to 0.25.

Figure 3: *Counterfactual Income Distribution in the Absence of a Wealth Tax*
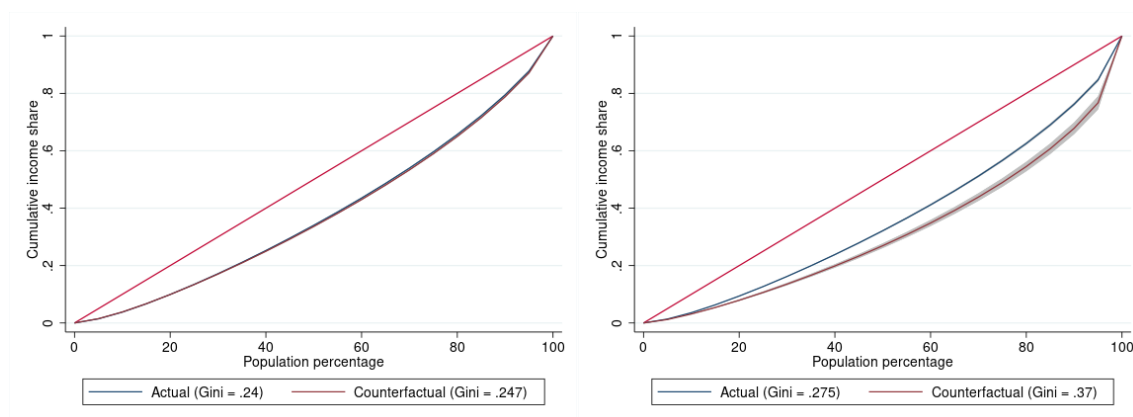
(a) *Wage Income Inequality*   **(b)** *Total Income Inequality*

B   Extensions

Heterogeneity: To explore heterogeneous effects, Table 2 presents estimation results for three ranges of net parental wealth. For the lower range (NOK 100,000 to 500,000), there is a combination of treated and untreated taxpayers by tax changes over time, and the estimates in this range are insignificant. The effect becomes significant at the middle range of wealth (between NOK 500,000 and 1.2 million). In the upper range, the effect becomes smaller but remains significant at the 1-percent level. This pattern is intuitive as at the very top of the wealth distribution, capital income becomes more important than labor income. Similarly, the effects of net parental wealth on the percentiles of the labor income distribution of the children and on their income mobility are the highest for the middle range of wealth (second and third rows of Table 2), and the effect remains significant, but smaller, at the very top. Additionally, the estimated counterfactual wage distribution in the absence of the wealth tax looks very similar after taking the heterogeneous effects into account (A.1).

Table 2: *Heterogeneous Effects across Wealth Levels*

Strategy	Adjusted IV		
Effect of	Net parental wealth		
On wage level	5.137	0.0380***	0.00790***
	(8.097)	(0.0116)	(0.00284)
On wage percentile	0.294	0.00226***	0.000519***
	(0.468)	(0.000712)	(0.000243)
On wage mobility	0.867	0.00528***	0.000321
	(1.368)	(0.00147)	(0.000374)
On total income	15.54	0.122***	0.131***
	(24.37)	(0.0359)	(0.0391)
Sample restrictions	100<PW<500	500<PW<1200	1200<PW
N	205,030	50,586	15,470

Standard errors in parentheses. * $p < 0.10$, ** $p < 0.05$, *** $p < 0.01$. All monetary amounts are measured in NOK 1000. PW is net parental wealth divided by the number of siblings in 1993. The effect is the change in net parental wealth from 1993 to 1998 instrumented by the predicted wealth tax change given parental wealth in 1993. Controls are wages, education and age of father and mother, parental wealth and marital status in 1993, whether the individual earns mainly capital income, age, whether the individual is born in an urban area and year dummies. Mobility outcomes are measured in percentiles from father's wage income in 1993 to children's wage income in 2010-2017.

Underlying mechanism: There can be various mechanisms behind our findings. For example, wealth can potentially affect human capital formation, and thus wages, possibly through: i) affordability of private education (particularly relevant for countries with higher private provision of education and less relevant for Norway); and ii) decision to invest in human capital (e.g., to attend a graduate school or not). We do replicate the main results of Table 1 after controlling for higher education and the field of study (science, business, etc) of the children. Unsurprisingly, having a higher degree, positively impact wages. Importantly, the effects of net parental wealth on the wages of the children, the position on the wage distribution, and intergenerational income mobility, are very similar—slightly smaller after controlling for the education of the children (Table A.9 in the Appendix shows). This indicates that there are other mechanisms beyond the level of education of the children through which wealth affects intergenerational labor income.

As a first assessment to trigger further research on the linkages between the stock of parental wealth and wages of the children, we compute a measure of dispersion (the coefficient of variation) of labor income corresponding to bins of the stock of parental wealth, controlling for the education of the children. This measure is indicative of "risk-taking" in the sense that wage earners' decisions can also be associated with a risk profile (e.g., via occupational choices)—for instance a graduate

with a business administration degree from a wealthy family may take different career decisions, internalizing the wealth of the parents, from someone with the same degree but zero parental wealth. Next, we estimate the relationship between the wage dispersion measure and parental net wealth controlling for individual and parents' characteristics such as the level of education. We visualize the results here in Figure 4 and report the IV estimates in the Appendix (A.10).

The results in Figure 4 and the IV estimates in Table A.10 suggest a strong correlation between net parental wealth and dispersion in the returns to labor.[8] This finding indicates a novel mechanism related to the recent literature on the concentration of wealth within families across generations. T That literature points out to determinants such as financial risk-taking by investors and direct wealth transfers through bequest, inter alia (Fagereng et al., 2021). Thus the findings suggest that in addition to the set of reasons that generally operate through increasing capital income of the children, parental wealth appears to affect their risk-taking behavior—potentially through occupational choices, among other things—, generating larger labor income dispersion for high levels of net parental wealth. This finding is also consistent with the hypothesis that parental wealth acts as an insurance in the form of a private safety net (Pfeffer and Rodems (2021)).

Figure 4: *Labor Income Dispersion and Parental Wealth Levels*

(a) *Labor Income Dispersion*   **(b)** *Labor Income Dispersion, Controlling for Education*
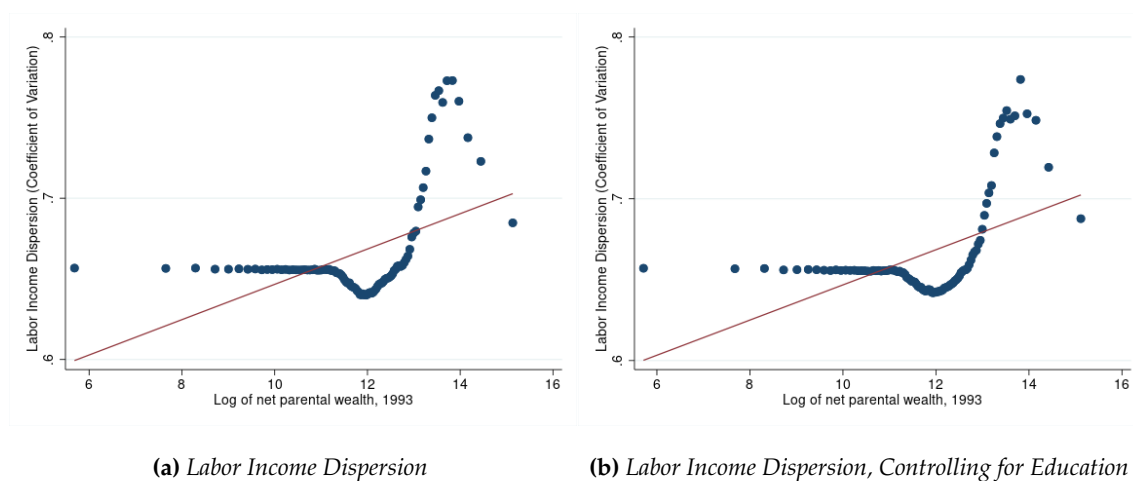
Note: The The binned scatterplot shows the estimated relationship between net parental wealth in 1993 and wage dispersion in 2010-2017, controlling for parents and individual's characteristics including education. The measure of wage dispersion is the coefficient of variation defined as the ratio of standard deviation to the mean (averaged within each bin of wealth).

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[8] Additionally, we do the same estimation for capital income, and also find that higher wealth is associated with higher dispersion of capital income (i.e., risk-taking), broadly in line with Fagereng et al., 2021 (Appendix, Figure A.2).

V   Conclusion

In an ideal world, parental wealth should not directly affect wages of the children. The discussion on wealth inequality stresses that parental wealth is a significant predictor of future wealth of the children through mechanisms such as wealth transfers and returns to wealth through links operating via *capital* income. Our findings add one more aspect to this discussion. Namely, using exogenous variations in parental net wealth, we find that children from wealthy families tend to have higher *labor* income. The analysis suggests that a wealth tax brings the income of the children closer to their peers from less wealthy families. This finding contributes to the debate on wealth taxation. It does not state that the wealth tax is the only, or the optimal, policy tool to influence intergenerational income inequality, but the results suggest that in the absence of the Norwegian wealth tax, intergenerational income mobility would have been lower.

Our results from Norway are also indicative for other countries. If wealth entails a "privilege effect" on the income of the children in a country with a relatively strong provision of public goods—especially health and education—, this raises the question whether this effect is even more pronounced in countries with lower provision of public goods. Our analysis does lend support to one—and thus far neglected—mechanism through which parental wealth impacts the income of the children. Results indicate heterogeneous returns to labor in the form of positive correlation between wage dispersion and parental net wealth. This finding suggests that the risk profile of occupational choice is influenced by the stock of parental wealth, contributing to the literature that attempts to explain why wealthy parents tend to have well-off children. Future research can shed light on further mechanisms.

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Appendix: Further Results

Table A.1: *Thresholds and Deductions in the Norwegian Wealth Tax 1993-2017*

	Singles			Married		
	Threshold 1	Threshold 2	Threshold 3	Threshold 1	Threshold 2	Threshold 3
	NOK	NOK	NOK	NOK	NOK	NOK
1993	120,000	235,000	.	150,000	260,000	.
1994	120,000	235,000	530,000	150,000	260,000	570,000
1995	120,000	235,000	530,000	150,000	260,000	570,000
1996	120,000	235,000	530,000	150,000	260,000	570,000
1997	120,000	235,000	530,000	150,000	260,000	570,000
1998	120,000	540,000	.	150,000	580,000	.
1999	120,000	540,000	.	150,000	580,000	.
2000	120,000	540,000	.	150,000	580,000	.
2001	120,000	540,000	.	150,000	580,000	.
2002	120,000	540,000	.	150,000	580,000	.
2003	120,000	540,000	.	150,000	580,000	.
2004	120,000	540,000	.	150,000	580,000	.
2005	151,000	540,000	.	181,000	580,000	.
2006	200,000	540,000	.	400,000	1,080,000	.
2007	220,000	540,000	.	440,000	1,080,000	.
2008	350,000	540,000	.	700,000	1,080,000	.
2009	470,000	.	.	940,000	.	.
2010	700,000	.	.	1,400,000	.	.
2011	700,000	.	.	1,400,000	.	.
2012	750,000	.	.	1,500,000	.	.
2013	870,000	.	.	1,740,00	.	.
2014	1,000,000	.	.	2,000,000	.	.
2015	1,200,000	.	.	2,400,00	.	.
2016	1,400,000	.	.	2,800,000	.	.
2017	1,480,000	.	.	2,960,000	.	.

Until 2006, married couples share one basic allowance and a joint threshold. From 2006, married couples share twice the threshold of singles on their total wealth. The threshold for singles and married is therefore the same independently of the distribution of couple wealth after 2006.

Table A.2: *Summary Statistics, Individuals, 2017*

Strategy	Mean in 1993		
	All	Married 1993-98	Unmarried and divorced 1993-98
Wage	513,155	526,999	454,621
	(372,967)	(372,580)	(368,756)
Capital income	31,770	31,591	32,677
	(445,701)	(363,359)	(694,284)
Total income	576,325	591,325	512,873
	(603,270)	(540,422)	(815,183)
Number of siblings	1.94	1.90	2.10
	(1.16)	(1.11)	(1.34)
Born in urban area	0.145	0.151	0.119
	(0.352)	(0.358)	(0.323)
Sample restrictions	PW>0	PW>0	PW>0
N	63,533	51,318	12,127

Standard deviation in parentheses. All monetary amounts are measured in NOK 1000. PW is net parental wealth in 1993.

Table A.3: *Summary Statistics, Parents (Main Variables)*

Strategy	Mean		
	All	Married 1993-98	Unmarried and divorced 1993-98
Married 1993	0.856		
	(0.351)		
Divorce 1993-1998	0.0552		
	(0.228)		
Net wealth, 1993	466,032	462,658	479,031
Median	233,756	252,307	153,497
	(6,420,489)	(1,096,826)	(14,450,127)
Net wealth, 1998	835,655	908,852	524,426
Median	387,268	437,132	135,752
	(4,461,313)	(5,530,931)	(8,018,887)
Financial wealth, 1993	320,826	302,948	393,668
Median	122,150	127,644	91,918
	(5,956,855)	(1,099,872)	(13,452,354)
Financial wealth, 1998	575,301	596,188	484,025
Median	138,048	150,026	84,916
	(6,703,878)	(6,639,670)	(6,974,936)
Wealth tax payment, 1993	3533	3256	4688
Median	0	0	0
	(83,412)	(13,966)	(188,735)
Wealth tax payment 1998-rules, 1993	2955	2624	4369
Median	0	0	0
	(98,126)	(11,210)	(224,388)
Sample restrictions	PW>0	PW>0	PW>0
N	63,533	51,318	12,127

Standard deviation in parentheses. All monetary amounts are measured in NOK 1000. PW is net parental wealth in 1993.

Table A.4: *Summary Statistics, Parents (Further Variables)*

Strategy	Mean in 1993		
	All	Married 1993-98	Unmarried and divorced 1993-98
Mother's wage	105,846	107,698	98,093
	(83,144)	(81,344)	(89,831)
Father's wage	199,051	213,627	136,577
	(158,989)	(153,314)	(164,258)
Mother's capital income	7307	6762	9605
	(62,510)	(55,654)	(85,728)
Father's capital income	30,340	32,100	22,565
	(291,760)	(286,937)	(311,184)
Mother's total income	127,329	130,281	114,951
	(117,451)	(111,127)	(140,487)
Father's total income	277,991	298,465	190,182
	(372,076)	(370,284)	(363,899)
Mother higher education	0.228	0.230	0.219
	(0.420)	(0.421)	(0.414)
Father higher education	0.173	0.182	0.131
	(0.378)	(0.386)	(0.338)
Sample restrictions	PW>0	PW>0	PW>0
N	63,533	51,318	12,127

Standard deviation in parentheses. All monetary amounts are measured in NOK 1000. PW is net parental wealth in 1993.

Table A.5: *First-Stage IV Estimation Results*

Effect of	Instrument
On net parental wealth	-21031.6***
	(1997.9)
t-value	-10.53
F-value	447.14
R^2	0.625
On parental financial wealth	-8983.5****
	(902.4)
t-value	-9.96
F-value	309.13
R^2	0.510
Sample restrictions	0<PW
N	480,971

Standard errors in parentheses. * $p < 0.10$, ** $p < 0.05$, *** $p < 0.01$. All monetary amounts are measured in NOK 1000. PW is net parental wealth divided by the number of siblings in 1993. The effect for Divorce IV is the predicted change in wealth tax payments given parental wealth in 1993 as a percentage of parental wealth in 1993 on the change in parental wealth between 1993 and 1998. Controls are wages, education and age of father and mother, parental wealth and marital status in 1993, whether the individual earns mainly capital income, age, whether the individual is born in an urban area and year dummies. Mobility outcomes are measured in percentiles from father's wage income in 1993 to children's wage income in 2010-2017.

Table A.6: *Direct Effect of Divorce on Wages of Children*

Strategy	OLS
Effect of	Parental divorce
On wage	-20.58***
	(2.221)
On wage percentile	-2.112***
	(0.243)
On wage mobility	-0.951***
	(0.263)
On total income	-42.41***
	(3.007)
Sample restrictions	0<PW<100
N	161,897

*Standard errors in parentheses. * $p < 0.10$, ** $p < 0.05$, *** $p < 0.01$. All monetary amounts are measured in NOK 1000. PW is net parental wealth divided by the number of siblings in 1993. The effect is parental divorce in the period 1993 to 1998. Controls are wages, education and age of father and mother, parental wealth and marital status in 1993, whether the individual earns mainly capital income, age, whether the individual is born in an urban area and year dummies. Mobility outcomes are measured in percentiles from father's wage income in 1993 to children's wage income in 2010-2017.*

Table A.7: *Total Income*

Strategy	OLS	IV	Adjusted IV	OLS	IV	Adjusted IV
Effect of	Net parental wealth			Parental financial wealth		
On total income	0.0329***	0.0879***	0.0871***	0.0352***	0.0887***	0.0796***
	(0.000877)	(0.0116)	(0.0126)	(0.0101)	(0.0110)	(0.0122)
Sample restrictions	0<PW	0<PW	200<PW	0<PW	0<PW	200<PW
N	480,971	480,971	270,995	480,971	480,971	270,995

*Standard errors in parentheses. * $p < 0.10$, ** $p < 0.05$, *** $p < 0.01$. All monetary amounts are measured in NOK 1000. PW is net parental wealth divided by the number of siblings in 1993. The effect is the change in net parental wealth from 1993 to 1998 instrumented by the wealth tax change. Controls are wages, education and age of father and mother, parental wealth and marital status in 1993, whether the individual earns mainly capital income, age, whether the individual is born in an urban area and year dummies. Mobility outcomes are measured in percentiles from father's wage income in 1993 to children's wage income in 2010-2017.*

Table A.8: *Main Results with Effect of Controls*

Strategy Effect on	OLS	IV Wage	Adjusted IV
Change in net parental wealth 1993-1998	0.00271*** (0.000356)	0.0167*** (0.00121)	0.0140*** (0.00119)
Net parental wealth 1993	0.00133*** (0.000182)	0.00773*** (0.000560)	0.00650*** (0.000551)
Parents married in 1993	35.35*** (1.194)	33.85*** (1.209)	34.74*** (1.250)
Earning mainly capital income 2013-2017	-442.9*** (0.930)	-449.4*** (1.153)	-459.9*** (1.698)
Father's wage 1993	0.176*** (0.00342)	0.142*** (0.00471)	0.134*** (0.00593)
Mother's wage 1993	0.179*** (0.00548)	0.184*** (0.00567)	0.181*** (0.00763)
Born in an urban area	15.81*** (1.252)	16.76*** (1.258)	15.75*** (1.841)
Father has higher education	23.37*** (1.316)	25.06*** (1.341)	25.78*** (1.863)
Mother has higher education	23.72*** (1.085)	21.16*** (1.127)	17.64*** (1.465)
Sample restrictions	PW>0	PW>0	PW>0
N	481319	481319	292673

Standard errors in parentheses. * $p < 0.10$, ** $p < 0.05$, *** $p < 0.01$. All monetary amounts are measured in NOK 1000. PW is net parental wealth divided by the number of siblings in 1993. The first effect is the change in net parental wealth from 1993 to 1998 instrumented by the wealth tax change. Mobility outcomes are measured in percentiles from father's wage income in 1993 to children's wage income in 2010-2017.

Table A.9: *Results: Controlling for Educational Level and Field*

| Strategy	OLS	IV	Adjusted IV	OLS	IV	Adjusted IV
Effect of	Net parental wealth			Parental financial wealth		
On wage level	0.00196***	0.0133***	0.0117***	0.00226***	0.0112***	0.00777***
	(0.000310)	(0.00103)	(0.00104)	(0.000238)	(0.000904)	(0.000897)
On wage percentile	0.000209***	0.00130***	0.00108***	0.000248***	0.00106***	0.000670***
	(0.0000272)	(0.000101)	(0.000104)	(0.0000219)	(0.0000873)	(0.0000862)
On wage mobility	0.000652***	0.00313***	0.00291***	0.000602***	0.00281***	0.00209***
	(0.0000637)	(0.000177)	(0.000188)	(0.0000507)	(0.000161)	(0.000155)
Sample restrictions	0<PW	0<PW	200<PW	0<PW	0<PW	200<PW
N	480,971	480,971	270,995	480,971	480,971	270,995

*Standard errors in parentheses. * $p < 0.10$, ** $p < 0.05$, *** $p < 0.01$. All monetary amounts are measured in NOK 1000. PW is net parental wealth divided by the number of siblings in 1993. We control for a dummy on whether the individual has completed higher education and a dummy on whether the higher education field was in business or science. The first effect is the change in net parental wealth from 1993 to 1998 instrumented by the wealth tax change. The second effect is the change in parental financial wealth from 1993 to 1998 instrumented by the wealth tax change. Controls are wages, education and age of father and mother, parental wealth and marital status in 1993, whether the individual earns mainly capital income, age, whether the individual is born in an urban area and year dummies. Mobility outcomes are measured in percentiles from father's wage income in 1993 to children's wage income in 2010-2017.*

Table A.10: *Labor Earnings Dispersion*

Strategy	OLS (no controls)	OLS	IV
Effect of	Net parental wealth		
Wage income dispersion	0.0000213***	$1.85 * 10^{-6}$***	0.0000135***
	$(7.77*10^{-7})$	$(1.19*10^{-7})$	$(9.35*10^{-7})$
Total income dispersion	$2.19 * 10^{-6}$***	0.000136***	0.0000770***
	$(5.01*10^{-7})$	$(7.13*10^{-7})$	$(4.46*10^{-6})$
N:	481,319	481,319	481,319

*Standard errors in parentheses. * $p < 0.10$, ** $p < 0.05$, *** $p < 0.01$. All monetary amounts are measured in NOK 1000. The effect of parental wealth on dispersion is calculated by constructing 100 groups of parental wealth and calculating dispersion within each of these groups, before running an OLS regressions of parental wealth in 1993 on the income dispersion measure. The parental wealth groups are constructed beginning with a bin of 100,000 and increasing it by a factor of $bin^{1.1}$, to measure dispersion also at the top.*
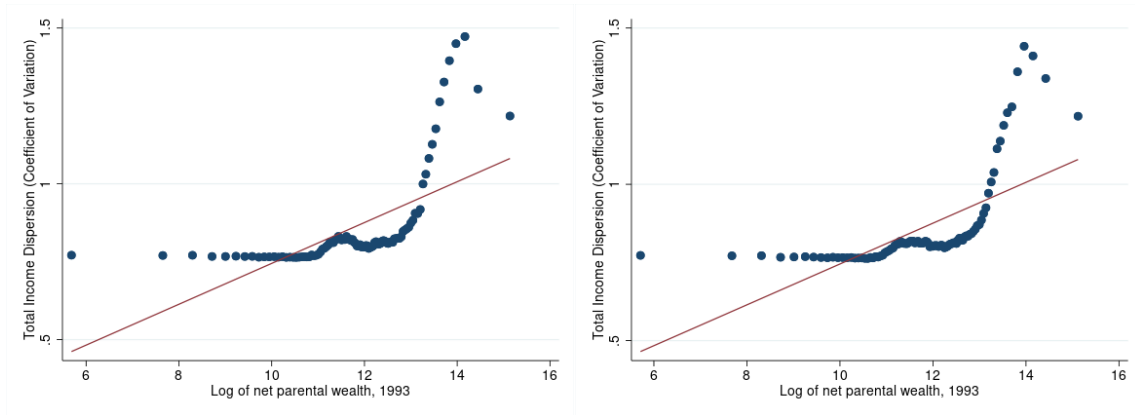
Figure A.1: *Income Inequality (Considering Heterogeneous Effects of Parental Wealth on Income)*
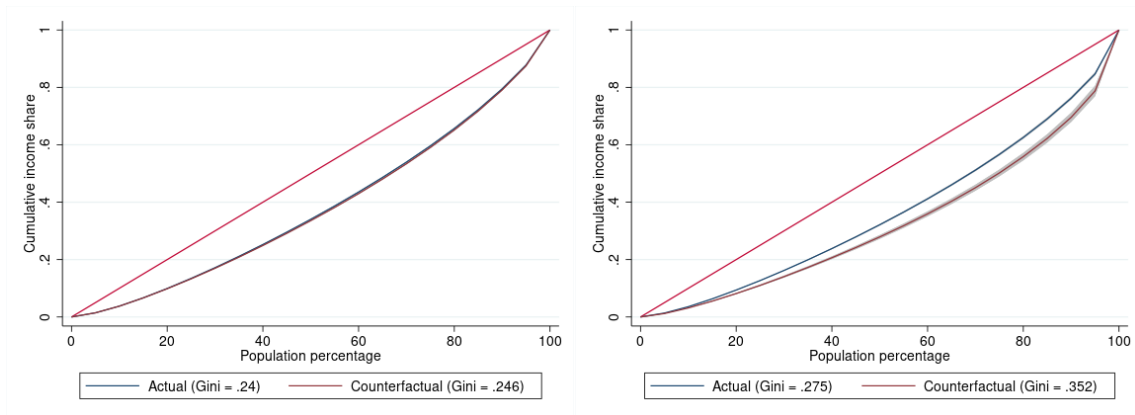
(a) *Wage Income*   **(b)** *Total Income*

Figure A.2: *Total Income Dispersion and Parental Wealth Levels*

(a) *Total Income Dispersion*   **(b)** *Total Income Dispersion, Controlling for Education*

Note: For each bin of the logarithm of net parental wealth in 1993, the figure shows the estimated relationship between net parental wealth and capital income dispersion, controlling for parents and individual's characteristics including education. The measure of total income dispersion is the coefficient of variation defined as the ratio of standard deviation to the mean (averaged within each bin of wealth).