

EARNINGS DISTRIBUTION, CORPORATE GOVERNANCE AND CEO PAY

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Abstract

We investigate the relationship between earnings differentials and the pay of CEOs of 186 British companies between 1970 and 1990. We find that (i) changes in the differential between the 90th and 50th weekly earnings percentiles for non-manual adult male workers explain changes in the level of real CEO salary and bonus in our sample of companies; (ii) changes in this differential also explain changes in the elasticity of CEO pay to firm size; (iii) broader measures of earnings inequality do a far worse job explaining changes in both the level and the firm size elasticity of CEO pay; (iv) fitting the model on data for 1970-83 and predicting pay levels for the period starting with the widespread adoption of executive share option schemes in 1984, our model essentially continues to predict CEO salary plus bonus, and fails to account for the additional compensation represented by the new share options.

We conclude firstly that top executive pay prior to 1984 was a stable function of both firm size and earnings differentials lower on the administrative ladder, consistent with a hypothesis advanced by Herbert Simon in 1957; and secondly that the use of share options from 1984 onward represents not simply a change in the mode of top executive compensation, but a structural break in the relationship between the pay of top executives and that of their subordinates.

JEL Classification: D31, J31

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The pay of CEOs of companies in both the US and the UK has risen significantly in real terms since 1980. In the UK, at least, this increase had been preceded, in the early 1970s, by a decline in real CEO pay. Little in the vast academic literature on CEO pay has anything to say about why these changes have occurred. The basic model employed by economists treats the pay of CEOs as a function of firm size and financial performance. The size effect is regarded as important but stable, while the effect of financial performance on pay is seen as variable, and as providing information about the mode of corporate governance. Most research focuses on the pay-performance relationship, even though this accounts for a relatively small component of CEO pay.

Even when substantial variations in the absolute level of CEO pay have caught the attention of academic economists in recent years, they have tended to turn to corporate governance explanations. For instance, Murphy (1997) argues that high (and variable) CEO pay is a sign that the interests of CEOs are becoming more closely aligned with those of shareholders, which he thinks is a good thing. Harrison (1994) views the same shift in alignment more critically, addressing the empirics of distribution rather than assuming that competitive markets will produce desirable outcomes. And O'Reilly, Main and Crystal (1988) provide evidence that high CEO pay is associated with such factors as incumbent CEO involvement in the recruitment of outside directors, implying that high CEO pay comes about with the entrenchment of personal CEO power, which most people think is a bad thing.

For all of this, it is not clear that changes in CEO pay levels *are* driven by corporate governance considerations. As Bok (1993) observes, when CEO pay is high overall income inequality and the incomes of other high-earners both tend to be high as well. Is it

possible that changes in CEO pay level are driven by broader changes in the distribution of earnings? Simon (1957) proposes that the level of CEO pay is determined by pay differentials throughout the managerial and professional ranks. Simon's model was meant to explain the apparent *stability* of the elasticity of CEO pay to firm size, but we test it by using it to predict *changes* in that elasticity and in pay levels. We also explore the question of whether the mid-1980s saw a structural change in the determination of CEO pay levels, marked by the increased use of share options in executive remuneration packages.

Data are drawn from the UK for the years 1970 to 1990. This period is well suited to our purposes, as the data display considerable variation in the relevant variables. The level of CEO pay and the inequality of earnings both varied considerably in Britain during these years: both real executive pay and inequality fell sharply in the mid-1970s, and then rose sharply throughout the 1980s. The use of share options as an important element in CEO pay packages was slight before 1984, and from 1986 on it has been considerable.

1. Data

We have data on CEO pay, sales (turnover), and other financial information for a balanced panel of 186 firms. 'Pay' is what is listed in the company's annual report as 'total remuneration' of the highest paid director. Although the measure of remuneration is supposed to include the value of benefits-in-kind, it otherwise corresponds to the salary plus bonus listing in US annual reports. Our data set is an extract from the Cambridge/DTI Databank of Company Accounts. All companies in question are private sector for-profit corporations. Finance, insurance, and property companies are not included, but other service firms are. The firms in this sample tend to be fairly large, for two reasons: first, large firms were more likely to have survived through the entire period in question and, second, through the vicissitudes of sample selection for the original data set, data on large

firms was more consistently collected than data on small firms (Meeks, Wheeler and Whittington). To give a concrete idea of the size of these firms, Figure 1 plots the distribution of employees across these firms in 1990. Summary statistics appear in Table 1.

Figure 2 shows changes in the median real pay of CEOs in our panel. The lower curve indicates salary plus bonus. We do not have data on executive share options for individual firms. We do have estimates, from Main, Bruce and Buck (1996), of the average value of share options (new options granted, plus change in value of existing options) relative to cash compensation. The Main et al series starts in 1981, while share option grants did not become an important element in UK executive remuneration packages until after the tax reform act of 1984. The upper curve in Figure 2 includes share option grants and appreciation. Figures are deflated to 1985 values using the Retail Price Index (RPI). Figure 3 shows the same figures, but deflated in this case by median earnings of adult male full time workers.¹

The very sharp drop in the relative pay of CEOs in the two years from 1974 to 1976 (Figure 3) coincides with an active incomes policy which effectively prohibited raises for those earning £10,000 or more per annum. Incomes policies soon went by the board but earnings compression did not: real CEO pay remained constant, and relative CEO pay continued to fall, until 1983. Then it rose sharply, by 1985 surpassing its 1973 peak in purchasing power. By 1989, CEO pay had reached eleven times the median full-time adult male wage before share options, and seventeen times after share options are included.

Increased inequality of earnings and income, for both individuals and households, in both the UK and the US, has been widely documented (Gottschalk and Smeeding, 1997). For the present study we use data from the New Earnings Survey (NES), which reports selected percentiles (10, 25, 50, 75, 90) of the distribution of weekly gross earnings for various categories of full-time adult workers in the UK from 1970 on. A common way of comparing changes in inequality

using data of this sort is to take ratios of selected percentiles, such as 90:10 or 75:25. Figure 4 shows changes in two such ratios: that between the 90th and 10th percentile weekly wage for all adult males in full-time employment (90:10), and that between the 90th and 50th for adult males in full-time non-manual employment(90:50). We use ratios for male workers because, for most of the years studied here, the NES does not report consolidated figures for male and female workers.

Notice that by both of these measures UK earnings inequality was falling during the early 1970s. It started rising in 1977 by the broader measure, and 1979 for higher-earning non-manual male workers. The compression of earnings differentials in the mid-seventies had several causes. Trade union power was at its zenith, and had the effect of boosting earnings at the lower end of the distribution. Progressive income taxation was also at its peak, making it more costly for employers to use high pay as an incentive (the figures here are pre-tax). And as previously noted, in certain years in the mid-1970s an active incomes policy capped increases in earnings, with the more stringent restrictions applying to the higher earnings.

2. Theory

How are we to explain changes in the level of CEO pay? Although our interest is in the relationship between CEO pay and earnings distribution, we must start with the size of the firm. Virtually all studies of CEO pay levels find that most of the variation in cross sections and short panels is due to differences in firm size. 'Size' can be measured in several ways, but much the same results are obtained whether sales, assets or number of employees is used as a proxy for size. The basic model is:

$$\text{CEO} = \beta_0 + \text{SIZE}^{\beta_1} + u'$$

taking logarithms, this becomes:

$$\ln\text{CEO} = \beta_0 + \beta_1 \ln\text{SIZE} + u \quad (1)$$

The *invariance* of the elasticity of CEO pay to firm size is often treated as a stylized fact. Rosen (1992) says that this elasticity falls in a tight range between 0.20 and 0.24, while Baker et al. (1988) and Main et al. (1996) make similar assertions. Yet if we look at the studies cited by these authors, it is hard to discern the basis for any belief in the constancy of this coefficient. Cosh (1975), in a study of UK companies between 1969 and 1971, found pay:size (with size represented by net assets) elasticities in different industries ranging from 0.17 to 0.42. Even in broader (i.e., mixed industry) samples, the studies cited by Rosen in support of his claim actually found elasticities ranging from 0.19 to 0.35. Rosen points out that these studies used not only different samples, but different measures of size and pay, and different statistical methods, so that much of the difference in estimates might be put down to differences in measurement and estimator. Yet, using the same 186 firms and the same estimator and model over a twenty one year period, we find pay:size elasticities ranging from 0.21 to 0.33. Figure 5 shows annual OLS estimates of (1), augmented by a control for profitability, for each year from 1970 to 1990:

$$\ln\text{CEO}_{i,t} = \beta_{0t} + \beta_{1t} \ln\text{SIZE}_{i,t} + \beta_{2,t} \text{PROFIT} + u_{i,t} \quad (1a)$$

Where CEO is the the salary plus bonus of the highest paid director, SIZE is the firm's sales (turnover), and PROFIT is return on capital employed (ROCE). For the robustness of cross sectional OLS estimates of the firm size:pay elasticity see Guy (1999).

Figure 5 shows changes in not only the size coefficient but also the intercept. The two coefficients are mirror images: the size coefficient falls and then rises in roughly the same pattern as both median CEO

pay and wage inequality, while the intercept in the model does the reverse.

Note the similarity between the path of the size coefficient in Figure 5 and median real CEO pay in Figure 1. When CEO pay falls or rises, it is not simply a question of the overall *level* shifting, but of the relationship between pay and firm size changing. When the median level of CEO pay in our sample rises, the CEOs of large firms get a disproportionately large increase, and those of small firms a disproportionately small increase. In other words, higher CEO pay is associated with greater inequality among CEOs. Figure 6 shows this relationship with scatter plots of median CEO pay, estimated pay:size elasticity from 1a, and 90:50.

The consistency with which wage inequality, CEO pay levels and pay:size elasticity track one another is in keeping with a model of Simon's (1957). Simon showed that β_1 in (1) could be expressed:

$$\beta_1 = \ln (d) / \ln (n) \tag{2}$$

where d is the percentage increase in pay from one level of the managerial hierarchy to the next, and n is the span of control, or number of subordinates per supervisor. Simon assumed that earnings on the lowest rung of the management ladder were determined by the market, that the span of control was constrained by cognitive limits, and that the differential between levels in the hierarchy was a matter of social convention. On the last point, Simon contended that there is a *rule of proportionality*, whereby the proportional difference between a supervisor's pay and a subordinate's is approximately constant from the bottom of a managerial hierarchy to the top.

Simon presented his model not as an explanation for changes in executive pay levels, but for what appeared to be the stability, over time and samples, of the elasticity of pay to firm size (though for Simon that invariant elasticity fell between 0.33 and 0.37, not the 0.20

to 0.24 found by Rosen). He showed that if both the span of control and the differential between supervisor and subordinate are constant, the elasticity of pay to firm size will be constant as well.

While it was intended as an explanation for the constancy of CEO pay-firm size elasticity among firms and over time, Simon's theory in fact predicts that the firm size elasticity will change in response to changes either in pay differentials between hierarchical levels, or in the span of control.

Even if this model does explain changes in the level of CEO pay over time, is it subject to a structural break in the UK in the mid-1980s? At that time, share options became a major component in CEO remuneration packages. The rhetoric associated with granting share options is that they align the interests of executives more closely with those of shareholders and less closely with those of other stakeholders. Many academic analyses are consistent with this view: Murphy (1997) sees share options as part of a revolution in corporate governance which has produced a more efficient allocation of resources, while Harrison (1994) tells the same story in terms of class conflict rather than efficiency, with the changing role of top management instrumental for restoring the profit share after a crisis in profitability in the late 1960s and 1970s. Others have argued that a different sort of change in corporate control has taken place, in the form of greater personal control on the part of CEOs (Crystal, 1991). This is consistent with the explosion of share options, since the timing of option grants appears aimed at enriching them, not at making them partners in risk-taking (Yermack, 1997).

3. Estimating the Relationship between Earnings Inequality and CEO Salary plus Bonus

We have direct measures neither of the hierarchical earnings differentials within our firms, nor of the spans of control. However, ratios of deciles of the earnings distribution contain much of the same

information as Simon's β . If the differentials within hierarchical firms are reflected in differentials between deciles of the workforce, then earnings ratios from NES data and Simon's β both are positive functions of the differential between levels in a hierarchy, and negative functions of the span of control. In particular, the difference between the 90th and 50th earnings percentiles for adult males in full-time non-manual employment (90:50) should reflect differentials at the lower end of the management ladder.

Since we are using 90:50 as a measure of earnings dispersion in the lower management ranks, it is of interest to know how earnings in this range compare with those of the CEOs in our sample. The relationship between the 90th percentile of non-manual male earnings and CEO earnings is shown in Figure 7. The former have been annualized by multiplying full-time weekly earnings by 52. The lower curve in Figure 7 is the ratio of the 10th percentile of the CEO sample with the 90th of the non-manual male sample. This ratio ranges between two and three for the entire period of the study. This is of the same order as the difference between the 90th and 10th percentiles of earnings for *all* adult males employed full time (see Figure 2). The upper curve in Figure 5 shows that the ratio of the median CEO to the 90th percentile non-manual male varies between about 3.5 and 5.25.

To estimate the relationship between higher-income male earnings dispersion and the pay of corporate CEOs, we begin with general specification:

$$\ln\text{CEO}_{i,t} = \alpha_0 + \alpha_1 \ln\text{SIZE}_{i,t} + \alpha_2 \text{INEQ}_t^{\alpha_3} \ln\text{SIZE}_{i,t} + \alpha_4 \text{INEQ}_t^{\alpha_5} + \alpha_6 \text{PROFIT} + u_{i,t} \quad (3)$$

where CEO is cash pay and INEQ is a measure of earnings dispersion. This model provides a time-varying estimate of both the pay:size

elasticity and the intercept, in keeping with what we observe in annual cross sections. The pay:size elasticity is:

$$\beta_1 = \alpha_1 + \alpha_2 \text{INEQ}_t^{\alpha_3} \quad (4)$$

and regression intercept for an annual cross section is:

$$\beta_0 = \alpha_0 + \alpha_4 \text{INEQ}_t^{\alpha_5} \quad (5)$$

We estimate (3) on the entire data set, using non-linear least squares. Results are reported in Table 2. Testing² zero (or, in the case of exponents, unit) restrictions on each coefficient individually and on each pairwise combination of coefficients α_1 to α_5 , we find that the preferred model incorporates the restriction $\alpha_1=0$, $\alpha_5=1$, or:

$$\ln \text{CEO}_{i,t} = \alpha_0 + \alpha_2 \text{INEQ}_t^{\alpha_3} \ln \text{SIZE}_{i,t} + \alpha_4 \text{INEQ}_t + \alpha_6 \text{PROFIT}_{i,t} + u_{i,t} \quad (3a)$$

Further zero restrictions are rejected, although the restriction

$$\alpha_3 = -\alpha_4 \quad (3b)$$

is accepted. Thus the strongest model, in statistical terms, requires only one additional variable (90:50) and one additional coefficient (four rather than three) compared with the model assuming no change in elasticity or intercept, *viz*

$$\ln \text{CEO}_{i,t} = \alpha_0 + \alpha_1 \ln \text{SIZE}_{i,t} + \alpha_6 \text{PROFIT}_{i,t} + u_{i,t} \quad (3c)$$

which we estimate for comparison. 3c imposes the restriction $\alpha_2=\alpha_4=0$. This specification is clearly inferior to those in which elasticity and the intercept both change over time. Figure 8 plots the pay:size elasticities (4) implied by 3a, 3b and 3c against the benchmark annual estimates obtained from 1a.

Our rationale for using percentiles from the upper half of the non-manual adult male earnings distribution (90:50) is that, given the limitations of our data, this is our best measure of inequality at the lower end of the executive career ladder. Use of this measure is consistent with Simon's theory, which dealt with a career ladder within an administrative hierarchy, not the work force as a whole. Are we right to follow Simon on this point, or is CEO pay in fact just as closely related to even broader changes in the distribution of earnings?

To check this, we use the broadest inequality measure allowed by our data, the ratio of 90th and 10th earnings percentiles for all (i.e., both manual and non-manual) adult males in full-time employment (90:10). Model 3d is the same as 3b, except that 90:10 is substituted for 90:50. We see in Table 2 that the broader inequality measure yields results which are statistically far weaker than those of the narrower one. Figure 9 plots the elasticities from 3d against 3b, 3c and 1a; visual comparison confirms the statistical judgement.

A numerical measure of the relative conformity of 3a, 3b and 3d with the benchmark 1a is given by

$$\text{Fit}(i) = 1 - ([\sum_t(\beta_{1,i,t} - \beta_{1,1,t})^2/t] / [\sum_t(\beta_{1,3c,t} - \beta_{1,1,t})^2/t]) \quad (6)$$

where $\beta_{1,1}$ is the sales coefficient from (1), $\beta_{1,3c}$ that from 3c. This measures how much of the difference between the constant-coefficient pooled model (3c) and the independent annual estimates (1a) can be accounted for by the models incorporating wage inequality terms. We obtain $\text{Fit}(3a)=0.86$; $\text{Fit}(3b)=0.85$; $\text{Fit}(3d)=0.47$. In short, most of the change in level, and firm-size elasticity, of CEO pay can be explained by changes in earnings dispersion of middle-high income non-manual male workers.

4. Model Stability and Share Options: A Structural Break in the 1980s?

The results of the previous section show that major changes in both the level and the firm size elasticity of CEO pay can be accounted for by changes in the dispersion of earnings for high-earning male workers. But is this relationship really stable over time? In particular, do the parameters of the functional relationship between earnings differentials, firm size and CEO salary plus bonus change in 1984? In that year, the tax treatment of share options changed; from that year onward, changes in the value of share option holdings became a major element in the total compensation of CEOs in British companies. If these share options simply displace cash remuneration, we would expect a structural change in the determination of the level of salary plus bonus. If, on the other hand, there is no structural change in the determination of cash remuneration, we may paradoxically be able to infer a structural change in the determination of overall executive remuneration.

We do not have data on share option grants for individual executives. However, Main et al. obtained such information for sixty large UK companies from 1981 to 1989. In 1981, changes in the value of share options accounted for just 3% of total CEO remuneration in firms in their sample. This jumped to 12% in 1982 and 1983, 25% in 1984, and between 37 and 39% (but for a sharp one-year dip in 1988) for the remaining years of their study.

First we re-examine CEO pay without share options. We refit 3b on data for 1970 to 1983, and then 1984 to 1990. An F test fails to reject structural homogeneity at the 5% level.³ We also used coefficients from the 1970-83 period to predict CEO cash remuneration for 1984-90, and plotted the results in Figure 10: the median value of CEO cash remuneration from our sample is plotted alongside the median fitted value for 1970 to 1983, and the median predicted value for 1984 to 1990.

Next, making the assumption that all CEOs receive the same proportion of their salaries in the form of share options, we obtain CEO2 (salary + bonus + change in value of share option holdings) on the basis of the Main et al. estimates. We also assume that share options were an insignificant part of CEO compensation before 1981, and we omit 1990 due to lack of data. Statistical tests of structural change in the determination of CEO2 are inappropriate, because we do not have cross sectional data on share options. We can, however, get reasonable actual, fitted and predicted median values for CEO2, and these are shown in Figure 11.

The picture we are left with is that the relationship between 90:50, firm turnover and CEO cash remuneration remains stable from 1970 to 1990, through major ups and downs in both the earnings distribution and the pay of CEOs. Starting in the mid-1980s, even as CEO cash remuneration skyrocketed along with earnings differentials, CEOs began to receive substantial share option grants. Taking share options into account, we find that the mid-1980s saw a structural break in the relationship between lower-managerial earnings differentials, firm size, and top executive remuneration. Because the additional pay for top executives came in the form of share options, it left the underlying salary relativities intact.

5. Conclusion

Changes in the level of CEO pay have attracted considerable public attention and concern. In both Britain and the US, the pay of CEOs in publicly held firms is systematically reported, while that of other highly paid individuals is not. This makes it easy to think of high CEO pay as a phenomenon isolated from the broader distribution of earnings, and perhaps driven by innovations or malfunctions in corporate governance. Economic analysis of CEO pay has reinforced this view by focusing on the corporate governance question and neglecting the relationship between CEO pay and distribution.

This study reconnects the study of CEO pay with that of the earnings distribution. We show a relationship between CEO pay and upper-income male earnings differentials which is sufficiently consistent over time that it would be hard to argue that the two are determined independently of each other. The question of causality is, of course, a difficult one. If we believe, with Simon, that CEO pay is determined by differentials lower on the administrative ladder, then we would say that wider earnings differentials lower in the ranks have pushed up the pay of CEOs. On the other hand, it could be that CEOs, having somehow secured higher pay, allowed some of the benefits to trickle down to their closer subordinates. But whichever of these is the case, we cannot view the level of CEO pay as simply a matter of corporate governance, isolated from the larger earnings distribution picture.

The movement in CEO pay is well explained by movements in earnings differentials lower on the administrative career ladder, but not so well by broader changes in earnings differentials. This suggests a vertically segmented (dual or more elaborately so) labour market, in which differentials on the management ladder move closely together, but are to a substantial extent disarticulated from differentials elsewhere in the labour force.

The heavy use of share options in top executive pay packages after 1984 represents a structural change in the determination of executive pay, associated with efforts to re-align the interests of CEOs with those of shareholders. However, these new incentives appear to have been applied *additionally* to the usual determinants of salary and bonus. The particular novelty of share options appears to be less their ability to connect CEO pay to stock market performance, than the fact that they disconnect CEO pay from its historical proportional relationship to lower management salaries.

Notes

1. The ratio is conservatively stated (and also ignores certain cyclical factors) in that the figure for median annual earnings of male workers is obtained by multiplying the weekly rate by 52, hence assuming year-round employment. The CEO figure is on an annual basis to begin with.
2. Three test statistics, the Akaike Information Criterion (Akaike), the Schwartz Bayesian Criterion (Schwartz) and Adjusted R^2 were used to compare models. All three gave the same ranking. Akaike and Adjusted R^2 are reported in Table 1.
3. $F = 2.30$. With four restrictions and 3906 observations, the critical value at the 5% level is approximately 2.37.

TABLES AND FIGURES

Table 1. Summary Statistics, Selected Years. 186 Firms, 1985 Prices

1970				
Variable	Mean	Std. Dev.	Min	Max
CEO Pay	91545.97	53644.90	25392.86	319744.91
Sales (k)	502014.78	961754.81	9392.86	7461224.50
ROCE	0.17	0.10	-0.13	0.65

1975				
Variable	Mean	Std. Dev.	Min	Max
CEO Pay	75832.26	35879.51	25083.10	242686.98
Sales (k)	621634.29	1144751.19	12914.13	8584488.00
ROCE	0.17	0.10	-0.08	0.52

1980				
Variable	Mean	Std. Dev.	Min	Max
CEO Pay	66754.89	36952.12	24045.26	383875.56
Sales (k)	614161.16	1055986.48	12236.21	8083451.50
ROCE	0.10	0.13	-0.34	0.40

1985				
Variable	Mean	Std. Dev.	Min	Max
CEO Pay	92968.42	77001.22	13000.00	883100.00
Sales (k)	704218.38	1329192.56	6171.00	10725000.00
ROCE	0.16	0.12	-0.75	0.44

1990				
Variable	Mean	Std. Dev.	Min	Max
CEO Pay	145957.47	104246.08	22951.24	768613.62
Sales (k)	749563.96	1271073.55	3747.19	9681920.00
ROCE	0.15	0.18	-0.89	0.74

Table 2

Coefficient	Model (inequality measure)			
	3a(90:50)	3b(90:50)	3c(none)	3d(90:10)
α_0 Intercept	15.48 (1.08)	16.39 (.38)	8.08 (.055)	12.71 (.43)
α_1 SIZE	-	-	0.25 (.004)	-
α_2 SIZE*(INEQ $^{\alpha_3}$)	.02 (.004)	.018 (.0022)	-	.033 (.0045)
α_3	4.55 (.35)	4.81 (.20)	-	2.09 (.14)
α_4 INEQ	-4.27 (.63)	$-\alpha_3$	-	-1.75 (.17)
α_6 PROFIT	.57 (.05)	.56 (.047)	0.76 (.053)	.62 (.050)
n = 3906				
Standard errors in parentheses				
Adjusted R ²	0.5908	0.5908	0.4694	0.5565
Akaike Information Criterion	-1581.6736	-1581.0918	-2087.9993	-1738.8095

Figure 1. Distribution of Firms in Sample by Number of Employees, 1990

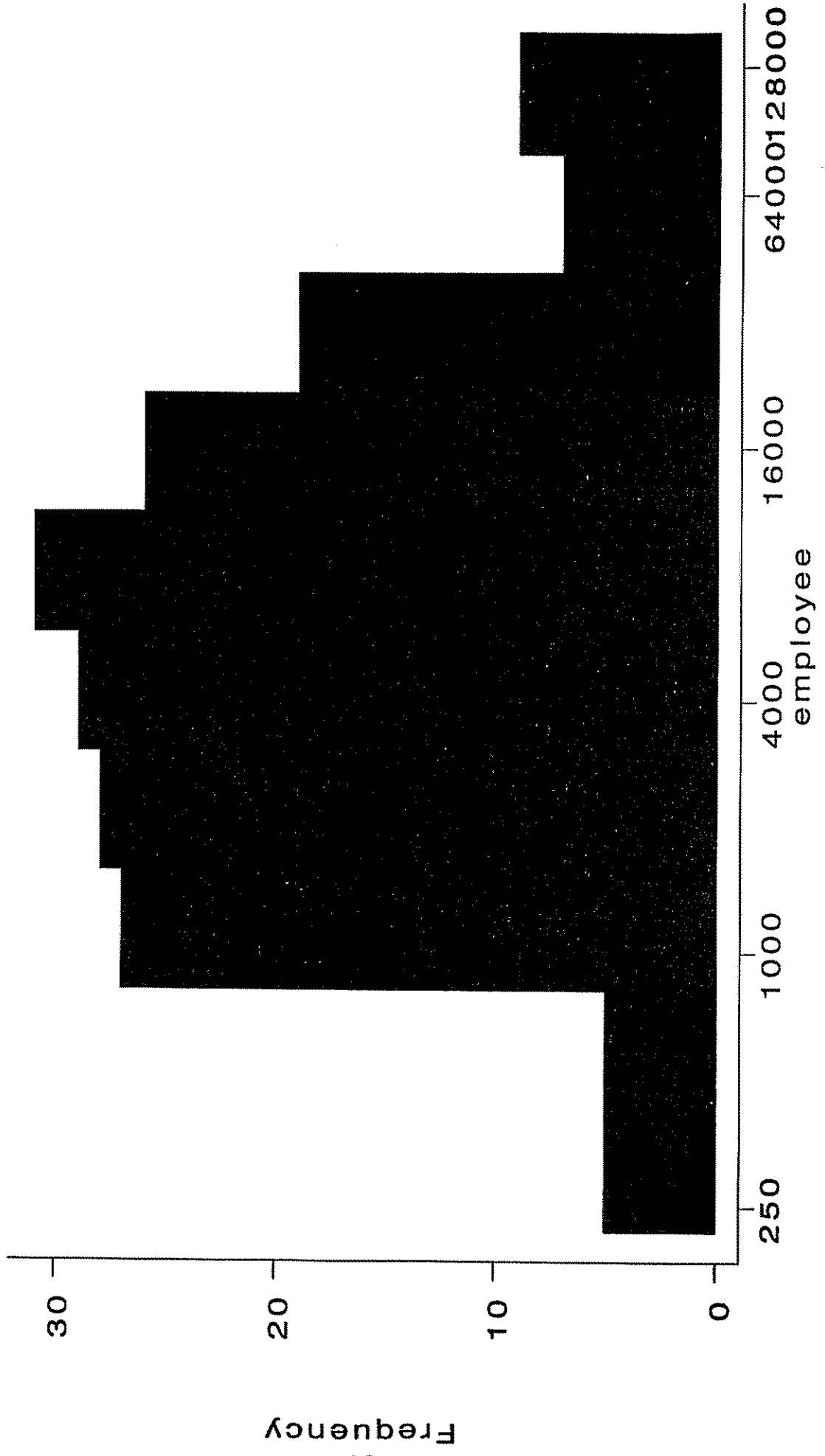


Figure 2. Median Real CEO Pay (Salary plus Bonus) from 186 Company Sample, and Median Pay plus Imputed Change in Value of Share Options, after Main et al.

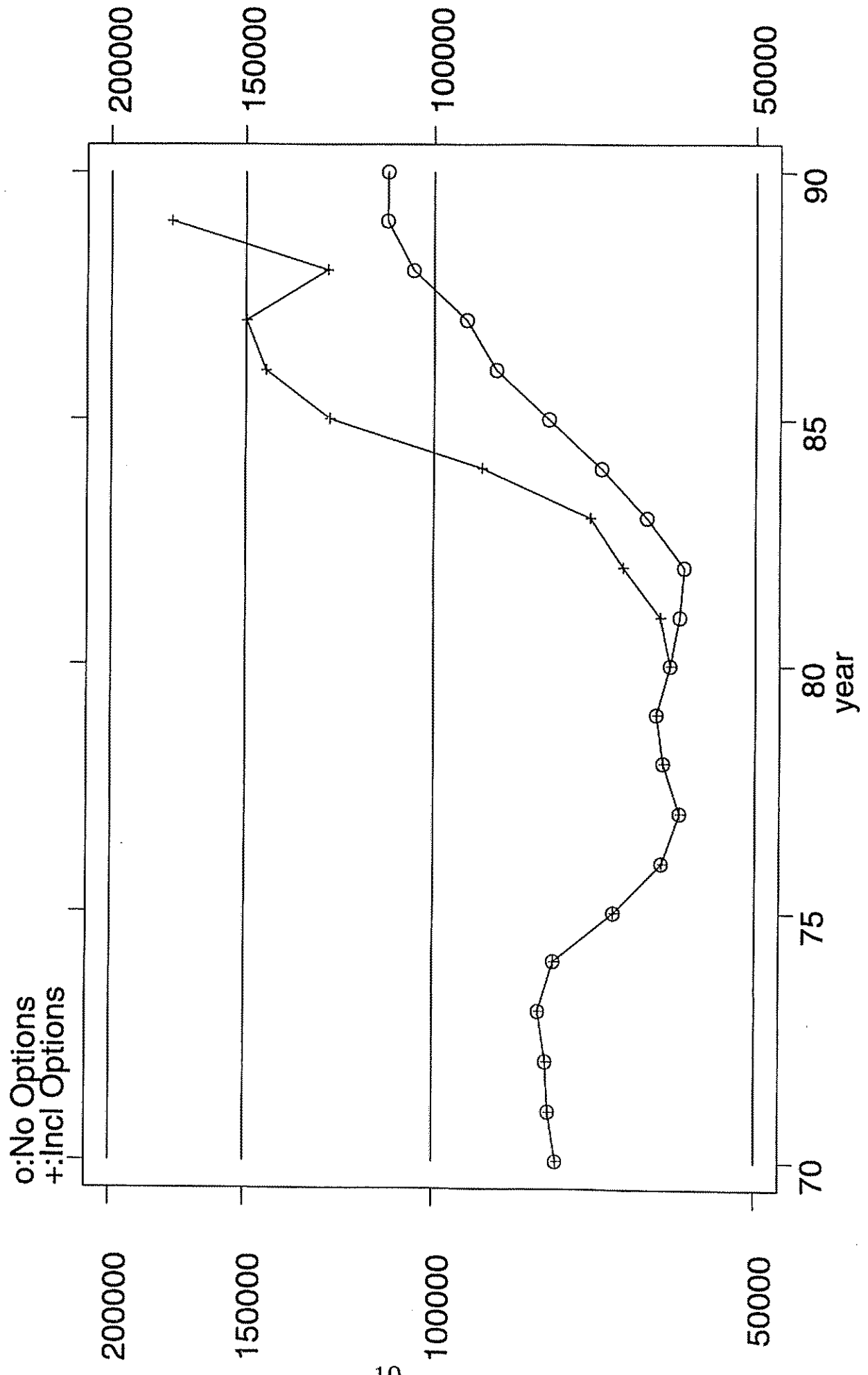


Figure 3. Median CEO Pay in 186 Company Sample, as a Multiple of Median Earnings for Adult Males in Full Time Employment (weekly earnings times 52). Upper Curve Includes Imputed Change in Value of CEO Share Options.

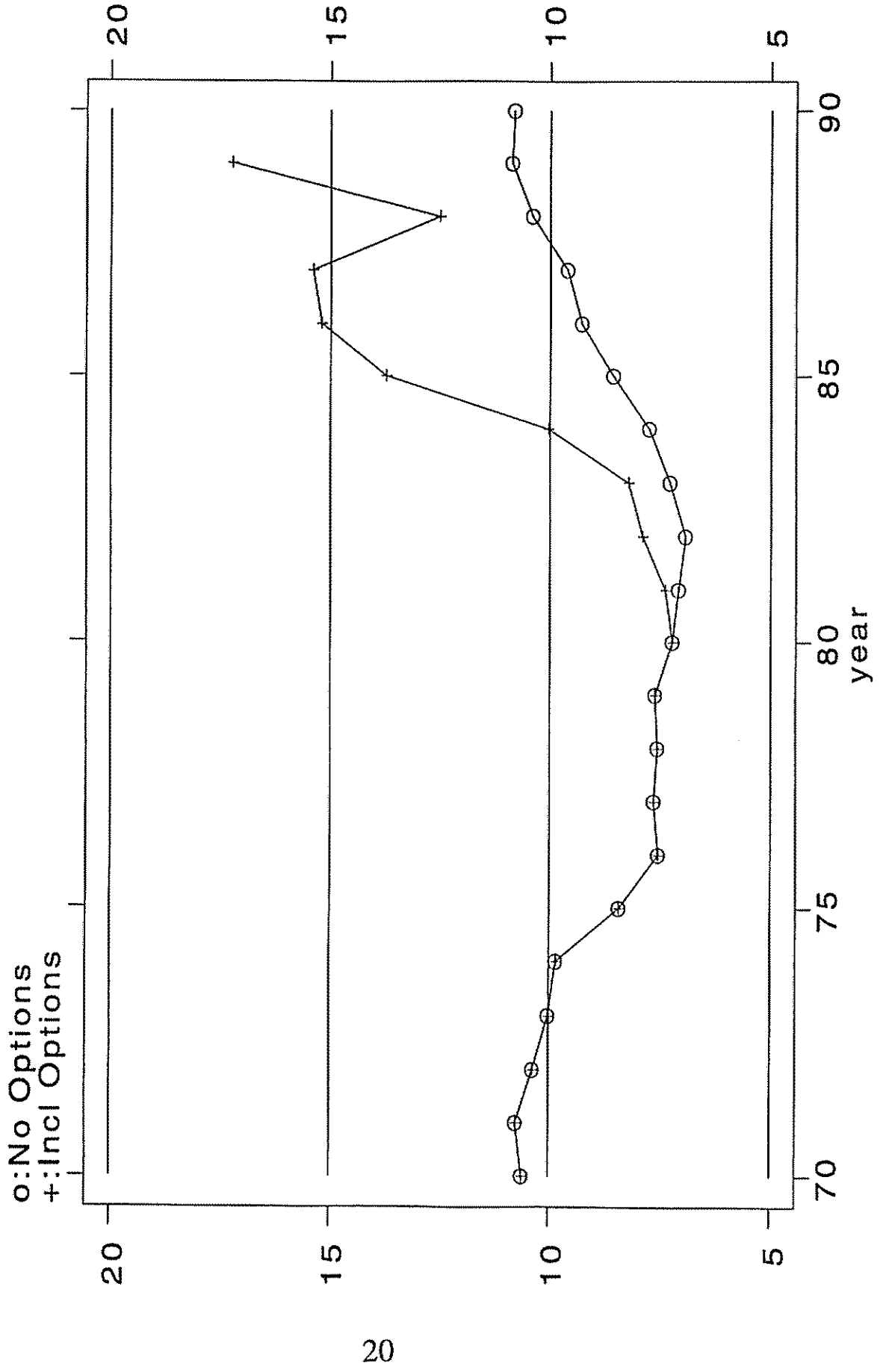


Figure 4. Two Measures of Earnings Inequality. The upper curve is the ratio of the 90th and 10th percentiles of the distribution of weekly earnings for all adult males in full time employment (90:10). The lower curve is the ratio of the 90th and 50th percentiles

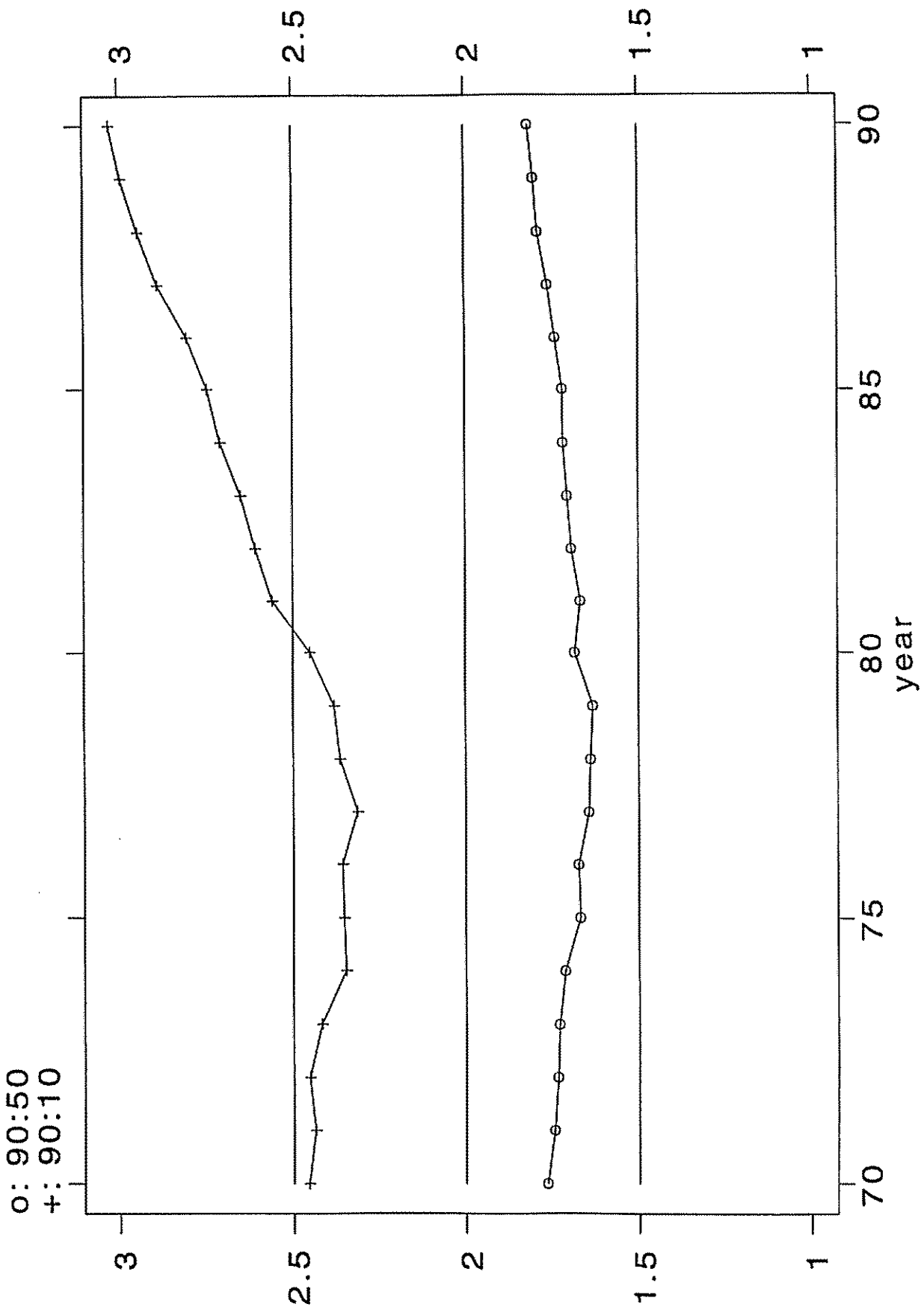


Figure 5. Elasticity of CEO Pay to Sales (β_1) and Intercept (β_0) from annual cross sections (model 1a)

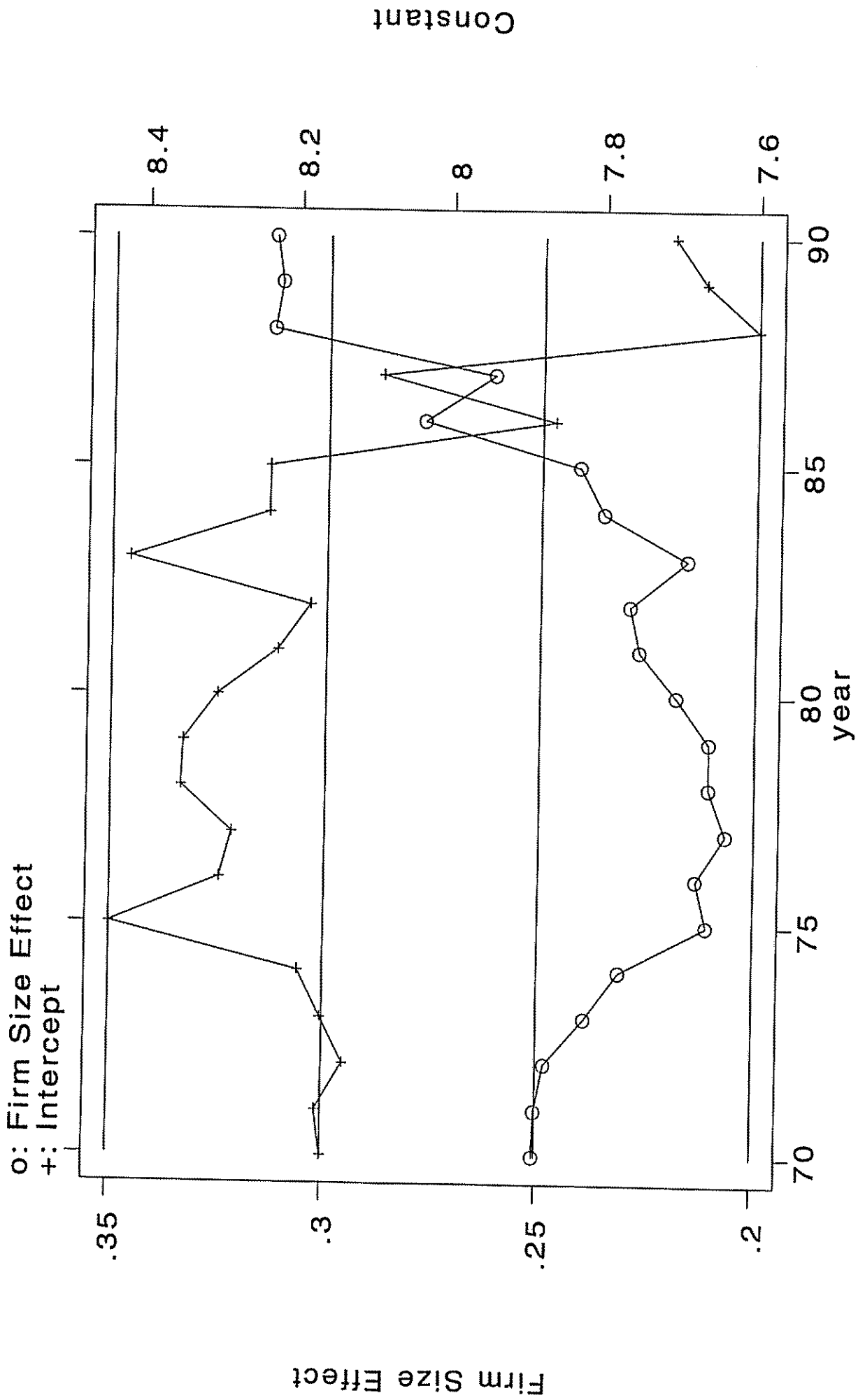


Figure 6. Scatter plots of Median Real CEO Pay, CEO Pay Firm Size Elasticity (model 1a), and Earnings Inequality Among Higher Earning Males (90:50). Each dot represents an annual observation

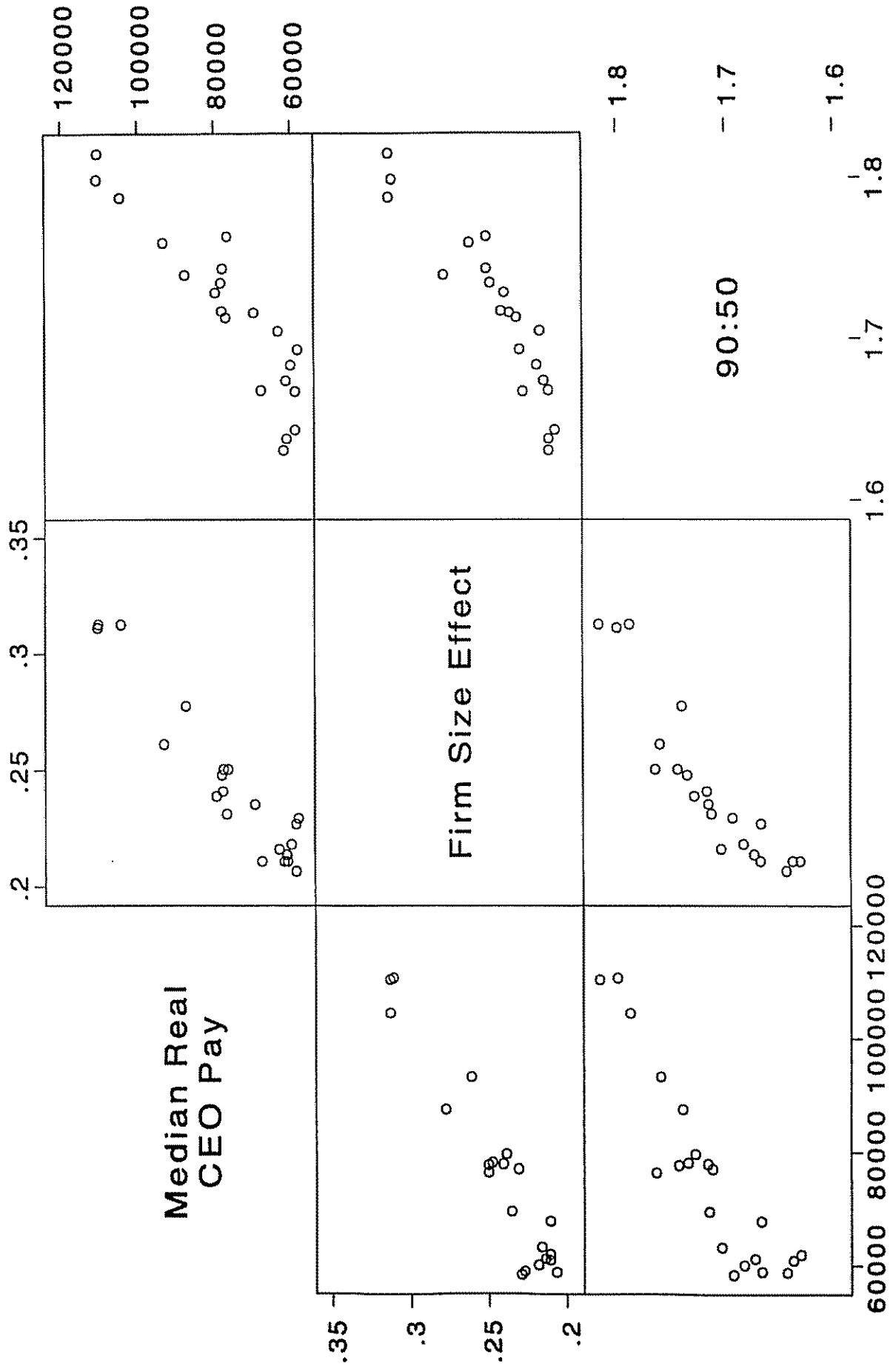


Figure 7. 50th and 10th percentiles of CEO pay in 186 company sample as multiples of 90th percentile of earnings for full-time non-manual adult male workers (weekly earnings times 52).

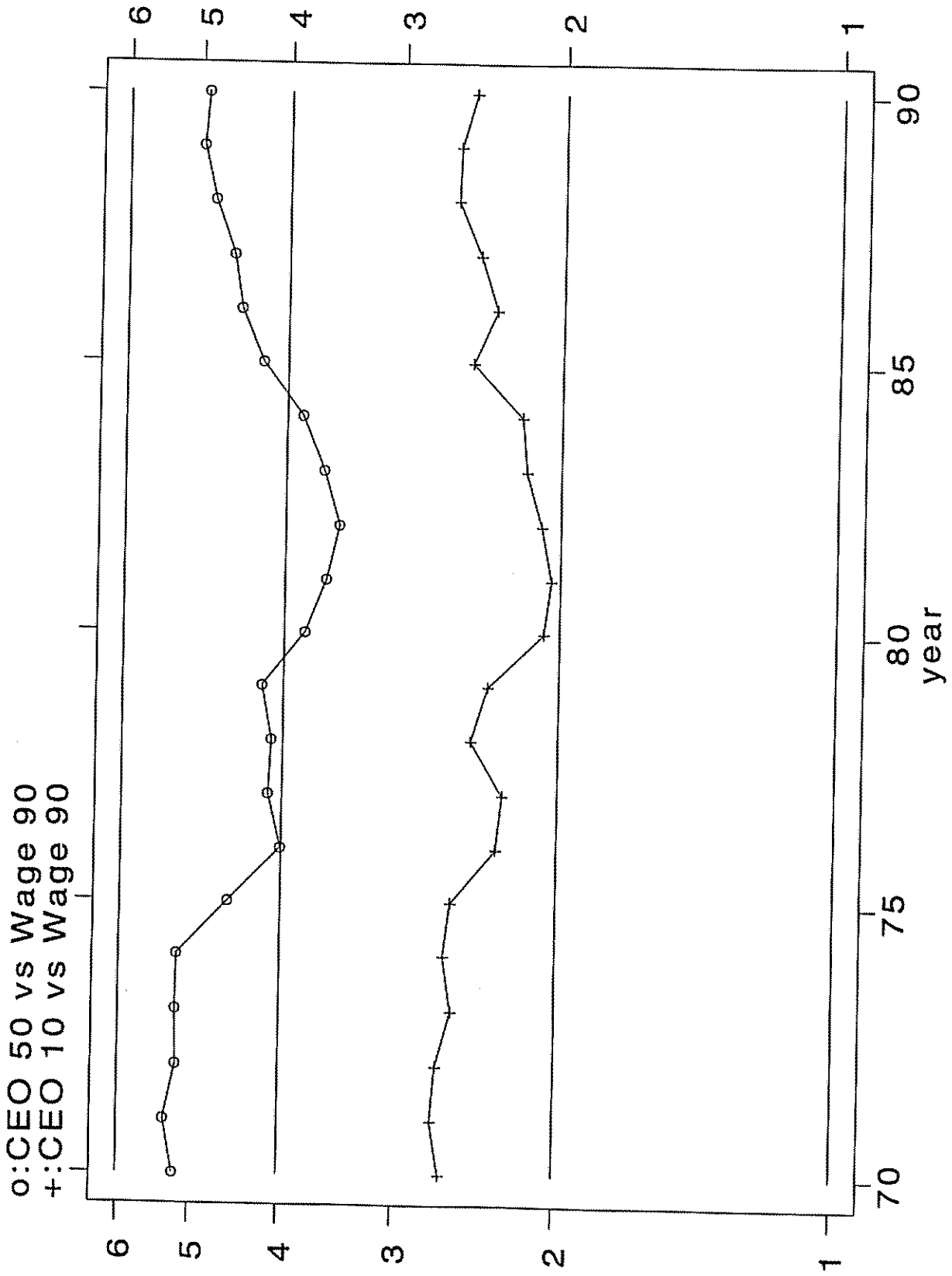


Figure 8. Models 3a-c against annual benchmark.

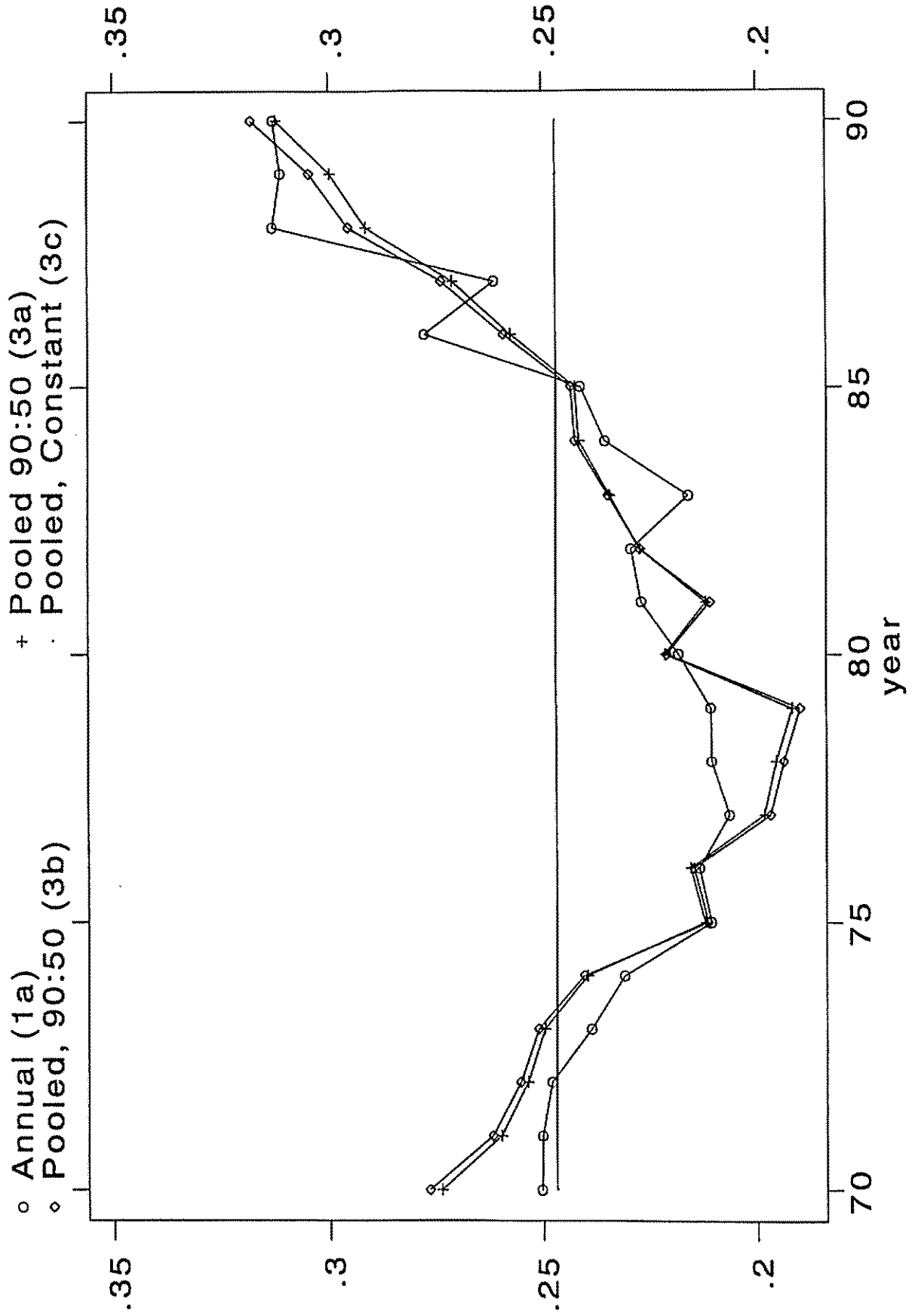


Figure 9. Narrow (90:50) and Broad (90:10) inequality measures against annual benchmark.

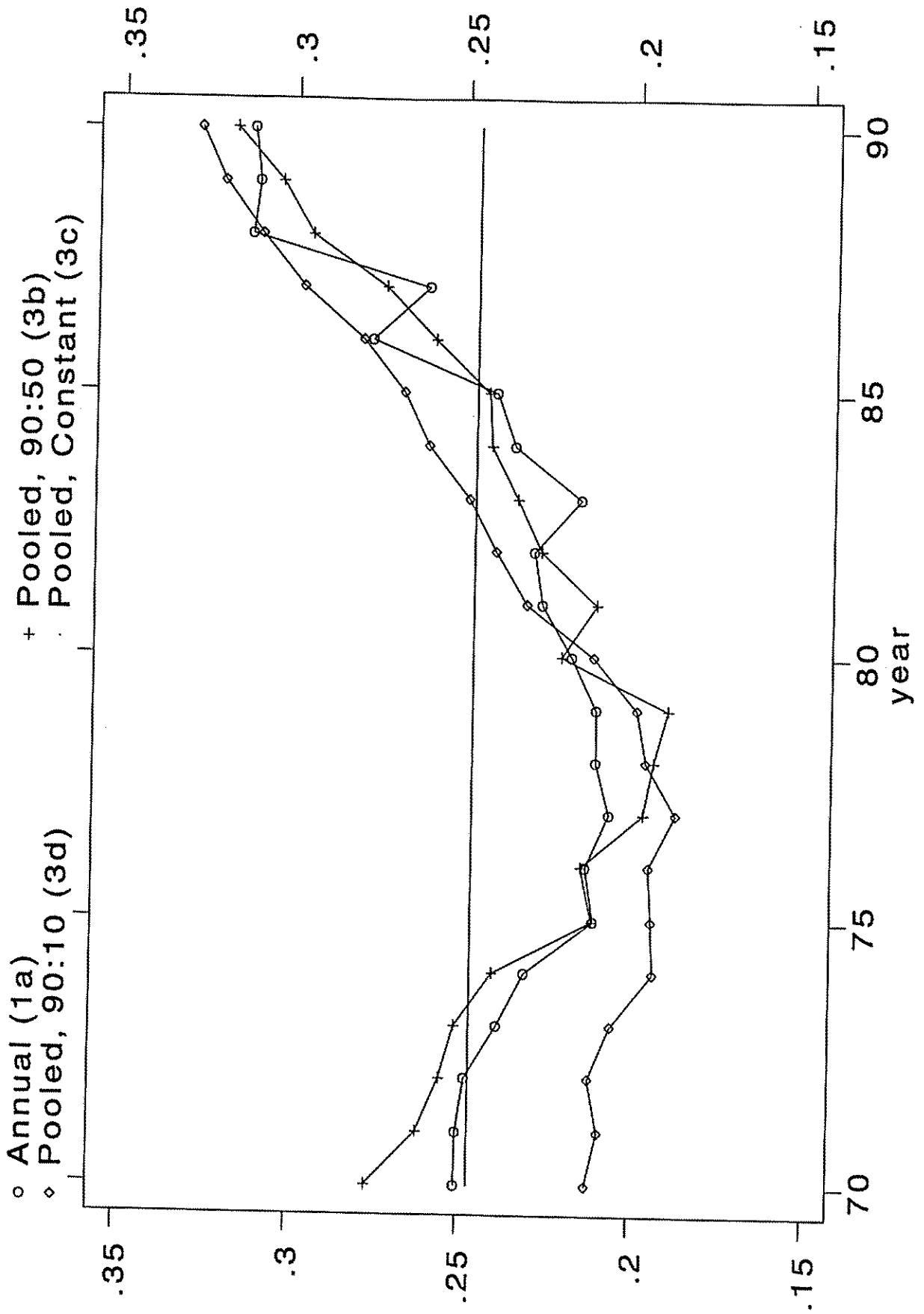


Figure 10. Predicted vs. Actual without Share Options.
 Median Real CEO Pay and Median Fitted CEO Pay, Based on Estimates from 1970-83.

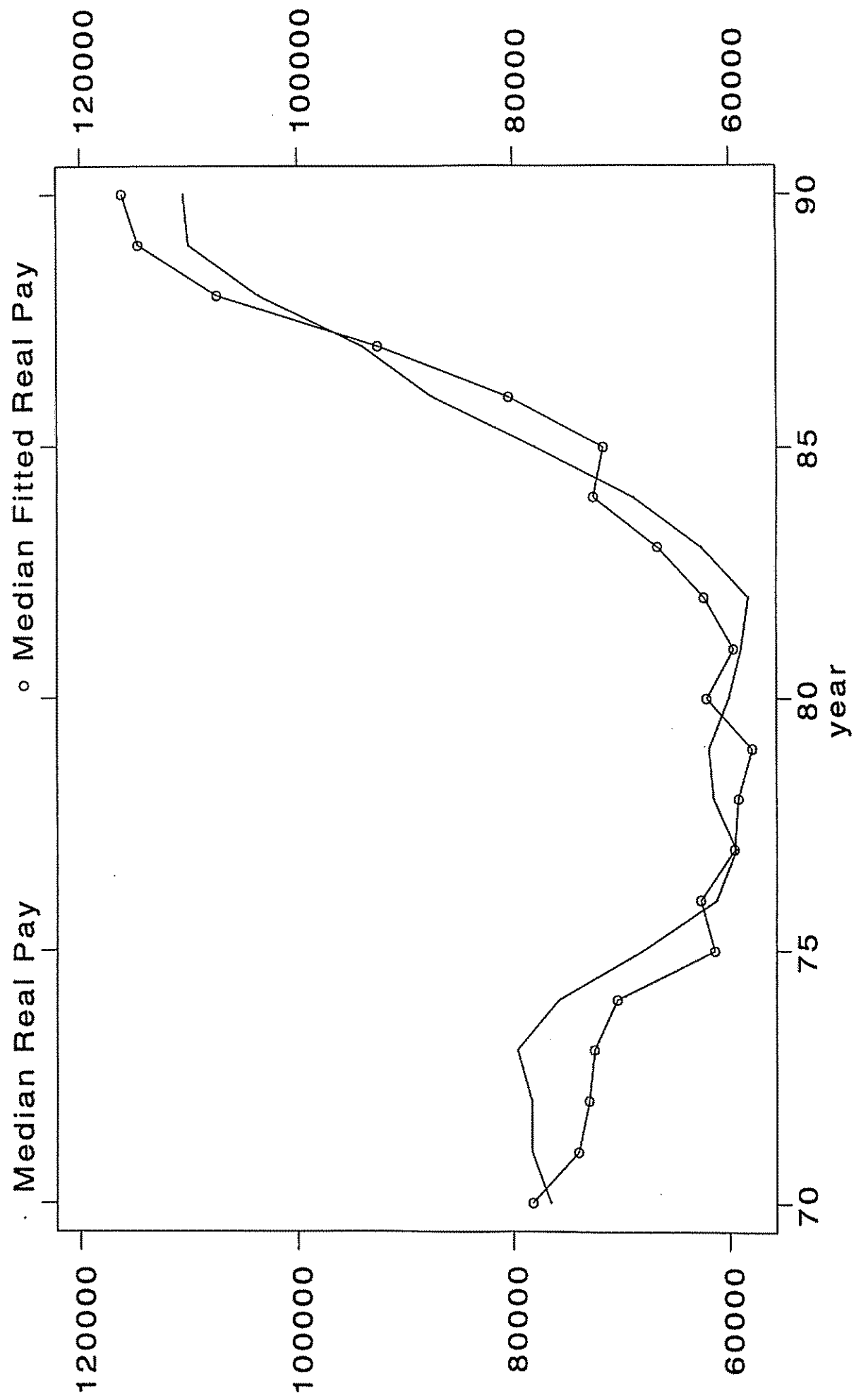
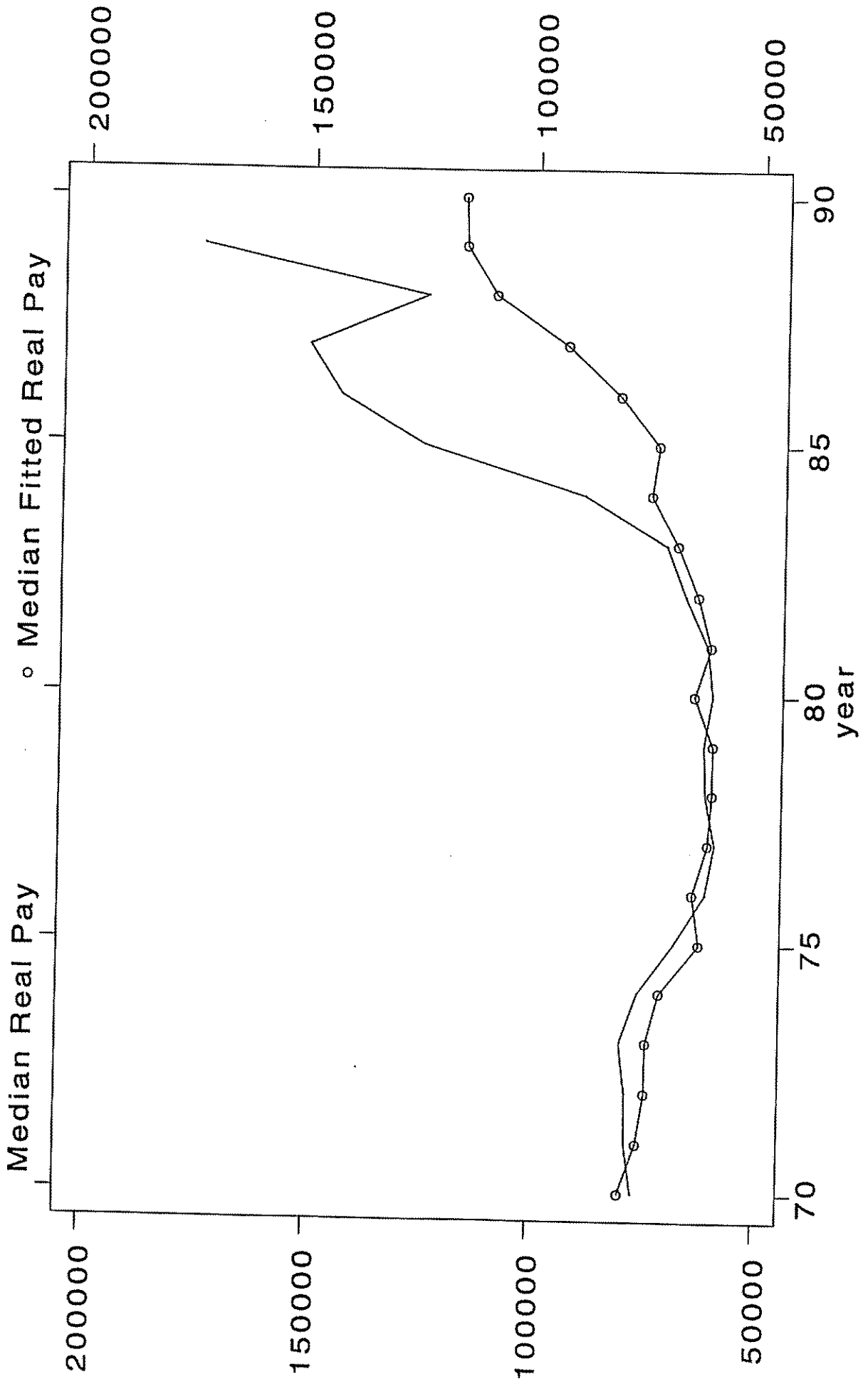


Figure 11. Predicted vs. Actual with Share Options. Median Real CEO Pay plus imputed changes in value of share options 1981-89, vs. Median Fitted CEO Pay, based on estimates from 1970-83.



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