Personal Costs of Executive Turnovers[*]

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Abstract

This study examines the personal costs of CEO turnovers using income data from the official records at the Danish Tax Authorities. We find that ousted CEOs' personal income is 35-45% lower in the five years following forced turnovers. The decline is driven by labor market outcomes: Labor and entrepreneurial incomes decline, while financial incomes increase. Consistent with the executive labor market being the main channel for the lower income, we find larger declines in income for executives with poor idiosyncratic firm performance during their tenures. Overall, the findings suggest that forced executive turnover is an important internal corporate governance mechanism.

Keywords: Executive turnover; Executive compensation; Corporate governance; Agency costs
JEL Classifications: G3, G30

Models of managerial behavior rely on executive turnover as an internal governance mechanism by which shareholders and corporate boards can threaten to discipline managers if firm performance is low (Mirrlees, 1976; Jensen and Meckling, 1976; Holmström, 1979; Shavell, 1979; and Fama, 1980). Such threats can reduce agency costs only if they are credible and carry a private cost for executives. The incentive effect of executive turnover depends on the expected cost of turnover, which equals the probability of turnover times the personal cost of turnover. Surprisingly, in spite of a rich body of literature on executive turnovers, most studies focus on the probability and determinants of executive turnovers, while the empirical evidence on the personal cost of forced CEO turnover is scant. This study attempts to fill this void by using detailed income data from the official records at the Danish Tax Authorities. We find that forced turnovers incur large personal costs: CEOs' income is 35%-45% lower in the five years following forced turnovers.

The emphasis on executive turnover as an important internal governance mechanism is highlighted in an extensive body of prior studies. The main preoccupation of these studies is estimating the extent to which turnovers depend on corporate performance and how corporate governance impacts the turnover-performance sensitivity.[1] Generally, this extant literature has documented a 2% to 6% higher turnover frequency per year for CEOs with low firm performance, and noted that the sensitivity is too weak to consider dismissals an important source of CEO incentives (Jensen and Murphy, 1990). More recent studies, however, find a higher sensitivity of executive turnover to firm performance. For instance, Jenter and Lewellen (2015) show that CEOs whose performance is in the bottom quintile have a 59% probability of leaving office during their first five years, compared to only 17% for CEOs in the top quintile.

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[1] See, among many others, Coughlan and Schmidt (1985), Warner, Watts, and Wruck, (1988), Weisbach (1988), Yermack (1996), Denis, Denis, and Sarin (1997), Hadlock and Lumer (1997), Parrino (1997), Perry (1999), Huson, Parrino, and Starks (2001), and Jenter and Lewellen, 2015). Murphy (1999) and Brickley (2003) offer reviews of the literature.

The focus on turnover frequencies, however, ignores that the incentive effect of executive turnovers depends both on the probability of turnover and the personal cost of turnover. Existing empirical work on the personal cost of executive turnovers has, as result of data limitations, been scant. A limited ability to follow executives and observe the income after turnovers has presented the main challenge. Labor market outcomes are typically only observed for executives that gain positions at public firms, leaving out many alternative and, perhaps, promising career paths for ousted executives. For instance, Fee and Hadlock (2004) use a news search to identify labor market outcomes following turnovers and find that only 186 out of 665 (27%) executives under age of 60 obtain a new executive position after job loss, typically at a smaller firm for a lower pay. Chang, Dasgupta, and Hilary (2010) follow a similar approach and find that 41% of CEOs who left their jobs before the age of 61 are appointed to a new executive position, and among them, two-thirds end up working for a smaller firm or lower pay.

Another strand of literature estimates the personal cost of corporate bankruptcy for top executives (Gilson, 1989; Gilson and Vetsuypens, 1993; Eckbo and Thorburn, 2003; and Eckbo, Thorburn and Wang, 2016). These studies estimate a CEO's personal bankruptcy costs based on executive shock holdings and post-turnover employment. With the exception of Eckbo and Thorburn (2003), who use Swedish tax returns to estimate a 47% decline in CEO labor market income after bankruptcy filings, these studies also trace post-bankruptcy employment using a news search. For instance, in Eckbo, Thorburn, and Wang (2016), post-turnover income can be observed for 20% of the CEOs who are subsequently appointed top executives at other public firms. Income is estimated for the 49% of departing CEOs who become top executives at private firms, self-employed, politicians, or consultants, while income is assumed to be $0 for the residual 31% of departing CEOs who are classified as having no post-turnover employment. Based on this approach, Eckbo, Thorburn, and Wang (2016) estimate that CEOs of bankrupt firms experience a median income loss of $4 million in present value terms.

Other studies examine the relationship between firm performance during CEOs' tenure and future appointments as corporate directors. For instance, Fama (1980) argues that managers of high-performing firms are more likely to become outside directors in other firms because the market prices directors according to their managerial talent. Consistent with this conjecture, a number of studies find a positive relationship between the stock price performance during the CEOs' tenure and accumulation of board appointments (Kaplan and Reishus, 1990; Gilson, 1989; Brickley, Linck and Coles, 1999; Yermack, 2004).

In this study, we estimate the personal costs of executive turnover using highly reliable income data from the Danish Tax Authorities. The main advantage of these data is that income is reported to the tax authorities by third parties because taxation in Denmark mainly occurs at the source level.[2] Thus, given the institutional setting, it is possible to systematically track the income of executives following turnovers irrespective of their career paths and, thereby, to overcome the main obstacle in estimating the personal cost of CEO turnovers. The main caveat with this approach is that the income data only covers individuals who live in Denmark. As a consequence of the limited international mobility of CEOs, the vast majority of CEOs of Danish firms between 1995 and 2007 satisfy this requirement. Between 1995 and 2007, only 14 out of 421 (3.3%) active CEOs were foreigners, and following turnovers, only 11 of the 137 ousted executives in the sample moved abroad. As a result, it is possible to track the income of 92% of CEOs who are ousted in this study. In comparison, income is observed for 27%, and 41% of the executive turnovers in Fee and Hadlock (2004), and Chang, Dasgupta, and Hilary (2010).

Compiling a sample of 313 executive turnovers between 1995 and 2007, we estimate the effect of forced turnovers on total income, which is the sum of labor income, entrepreneurial income, and financial income. We find that forced turnovers result for executives in total income

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[2] For instance, employers withhold income taxes and supply the Danish Tax Authorities with annual statements of wages paid to their employees. Financial institutions supply information to the Danish Tax Authorities on their customers' deposits, interest paid (or received), security investments, and dividends.

of 35%-45% lower than their income as CEOs. The decrease is driven by lower labor and entrepreneurial income, which declines by more than 45%, while financial income increases. As few as 20% of all ousted CEOs manage to recover the pre-turnover level of income after 5 years. That is, the decline in income is driven by a shift to lower income levels as more than 80% of all ousted CEOs earn less after they are ousted.

The decline in income is affected by the stock price performance during the CEOs' tenure. CEOs whose stocks underperformed the market during their tenure experience larger declines in income. Consistent with the executive labor market being the main channel for the lower income, we also find larger declines in income for executives with poor idiosyncratic firm performance during their tenures. Performance factors beyond the control of the executive, on the other hand, have no significant effect on future income.

An important question is the external validity of the results. This study's focus on the managerial labor in Denmark is motivated by the availability of high-quality register data. The Danish labor market is described by labor economists as being flexible, and generally allows workers to find jobs after displacements. For instance, the effect of displacement of (ordinary) workers on future income in Denmark is estimated to be 6%, which is comparable to other Nordic countries, but significantly below the 13% to 25% range for the United States (see Appendix A and references herein). The important question is, though, whether the managerial labor market is different from the general labor market. For instance, employment opportunities for ousted executives of publicly listed firms might be affected by the distribution of firm size in the economy and whether privately held firms of comparable magnitude exist. If the distribution of firm size is highly dispersed and skewed, forced turnovers might be costlier because publicly listed firms tend to be larger, and executive compensation is increasing in firm size. Prior research has documented that the dispersion and skewness of firm size in Denmark is on par with other European countries like the United Kingdom, but smaller than that of the United

States (Poschke, 2015). To further shed light on the external validity of the results, we examine the fraction of publicly listed firms to all firms across the distribution of firm size. The results suggest that the distribution of firm size in Denmark is comparable to other developed countries. The fraction of publicly listed firms to all firms across the distribution of firm size in Denmark is higher than in the Netherlands, comparable to those in Germany and the United Kingdom, and lower than in France and Sweden. Thus, ousted executives of publicly listed firms in Denmark seem to have the same outside job opportunities as executives in other developed economies. Finally, it should be noted that while the magnitude of the estimated cost of personal turnover might be specific to labor market conditions in Denmark, the cross-sectional evidence of the relationship between stock price performance and the cost of turnover is unlikely to be affected by these concerns. The cross-sectional evidence shows that executives with poor idiosyncratic firm performance have higher cost of turnovers, while performance factors beyond the control of the executive have no significant effect on future income. These results bolster the interpretation that the personal costs of executive turnovers are driven by the managerial labor market.

Overall, the results uncover economically significant personal costs of forced turnovers. The magnitude of the personal costs suggests that the threat of CEO dismissals is a more important source of CEO incentives than previously acknowledged. The findings complement earlier findings of poor labor market outcomes for ousted executives (Fee and Hadlock, 2004; Chang, Dasgupta, and Hilary, 2010) by delivering a more precise estimate of the personal costs. The estimated decline in income of 35%-45% is of comparable magnitude to Eckbo and Thorburn (2003), who use income data from the Swedish tax authorities to estimate a 47% loss in income for CEOs of bankrupt firms in Sweden. In comparison to Eckbo and Thorburn (2003), this study focuses on forced executive turnovers of publicly listed firms—excluding turnovers due to bankruptcy—and documents that the loss in income is driven by labor market

outcomes, as we find larger declines in income for executives with poor idiosyncratic firm performance during their tenure.

The results also have relevance for the ongoing discussion about the level of executive pay. High personal costs of executive turnovers provide an explanation for the increase in executive pay driven by a tighter governance regime, as suggested by Peters and Wagner (2014). If executives are risk-averse they will demand an executive turnover risk premium, which is increasing in the risk of turnover as well as the personal cost of turnover. Peters and Wagner (2014) estimate that a one percentage point increase in dismissal risk results in a turnover risk premium of between 3.5% and 10% when varying the personal cost of turnover between 20% and 75%.[3] The estimated personal cost of 35% to 45% from this study combined with the documented increase in turnover risk of about 4 percentage points over the last two decades (Kaplan and Minton, 2012), suggest that the executive turnover risk premium has contributed significantly to the rise in executive compensation. It also reinforces the view emphasized in the theoretical literature, that executive turnover is an important incentive mechanism for executives.

The rest of the paper is organized as follows. Section I details the data. Section II presents the empirical design and the results. Section III interprets the results and discusses the external validity, while Section IV summarizes the conclusions.

I. Data and sample selection

We construct a dataset with executive turnovers from 1995 to 2007 for firms listed on Copenhagen Stock Exchange using information from the Danish Business Authority (*Erhvervsstyrelsen)* as well as corporate announcements to Copenhagen Stock Exchange (www.nasdaqomxnordic.com). We classify executive turnover into forced and voluntary

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[3] The turnover risk premium is calculated as a certainty equivalent for an executive with risk aversion parameters between 2 and 3, and personal cost of forced turnover ranging from 20% to 75%.

according to the methodology developed by Parrino (1997). In addition to corporate announcements, we use newspaper articles to obtain the information needed to classify the turnover types.[4]

The dataset on executive turnovers is supplemented with economic, financial, and personal information about executives, as well as their firms. To construct the dataset, we rely on each executive's personal identification number (CPR), which is equivalent to the Social Security number in the United States. The personal identification number can be observed because the corporate law in Denmark requires firms to notify the Danish Business Authority within two weeks of a change in the executive position. Administrative registers in Denmark record information on personal identification numbers, which allows us to access personal data for executives using their personal identification numbers in anonymized form on a closed server environment maintained by Statistics Denmark. The personal records are constructed based on two different sources made available from Statistics Denmark, as explained below.

Income data are from the official records at the Danish Tax Authorities (*SKAT*). This dataset contains personal income data on the Danish population—including executives. Due to an extensive tax collection act, which secures that taxation mainly occurs at the source level, SKAT receives information about income directly from the relevant sources: employers withhold income tax and pay it directly to SKAT while informing SKAT about the actual wages paid to their employees. Similarly, financial institutions supply information to SKAT on their customers' deposits, interest paid or received, their security investments, and dividends. Through Statistics Denmark we have obtained access to total income and its major subcomponents (labor income, entrepreneurial income [profits, if any], financial income, and other personal income) from 1990

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[4] The methodology is as follows. Departures for which press reports state that the CEO is fired, forced out, or resigns due to policy differences are classified as forced. Turnovers of CEOs below the age of 60 that have not been classified as forced based on press reports are classified as forced if the articles do not report the reason to be death, poor health, acceptance of another position, or the articles report that the CEO is retiring, but the company does not announce the retirement date at least 6 months before departure. For further details, see Parrino (1997).

to 2012. Total income equals the sum of labor income, entrepreneurial income, financial income, and other personal income. Labor income includes salaries, bonus payments, stock options, and benefits. Entrepreneurial income is the pretax profit from self-employment and includes potential gains if the business is sold. Financial income includes realized capital gains, interests (received or paid), and dividends. Other income includes, among other things, perquisites (corporate car and personal expenses covered by the company), pension, and government transfers. The Danish tax system deems taxable income of stock options to occur when the options are exercised. Income from stock options at exercise is taxed as labor income, while potential gains after exercise are taxed as capital gains when they are realized. Thus, if a CEO exercises his option to buy stocks, the difference between the current market price and the exercise price will be taxed as labor income, while any additional realization of gains after exercise will be taxed as capital gains.

Individual data are from the official Danish Civil Registration System (*CPR Registeret*). These records include the personal identification number (*CPR*), name, gender, and date of birth. We use these data to obtain the personal characteristics of executives.

Finally, we supplement these data with company characteristics and stock prices from Datastream. We use these data to access the performance of CEOs during their tenure, and test whether idiosyncratic firm performance is related to the personal cost of executive turnovers.

A. Descriptive statistics

The analysis focuses on the executive labor market in the period from January 1, 1995 to December 31, 2012. Figure I shows the average total income and labor and entrepreneurial income (henceforth, labor income) for active CEOs between 1990 and 2012. Total income has, in real terms, increased almost twofold over the time period. The total income of an average CEO of 1.9 million year 2000 Danish kroner (DKK) in 1990 rose to 3.7 million in 2012. Income

is increasing in most years with the exception of the periods following the internet bubble (2001–2003), and the global financial crisis (2007–2009). Panel B of Table I shows that labor income accounts for most of the increase. Average labor income increased in real terms from 1.2 million in 1990 to 3.4 million in 2012.[5] In comparison to total income, the year-to-year changes are smaller for labor income. This difference is driven by financial income which tends to be larger (smaller) in years where stock prices are increasing (decreasing or negative). Although CEOs labor income is smoother, we still observe declines in labor income after the internet bubble and the global financial crisis. Overall, Figure I shows that CEOs enjoyed large real income growth in the time period over which we will analyze the personal cost of executive turnovers.

Table I provides details of our sample of executive turnovers for firms listed on Copenhagen Stock Exchange between January 1, 1995 and December 31, 2007. Our focus on executives who are active in this period allows us to observe the personal income for all turnovers five years before and five years after the event. Thus, for all executive turnovers, we observe personal income in an 11-year window around turnover events.

In total, 313 executive turnovers occurred between 1995 and 2007, equivalent to 10.2% of the CEO-years in the data. Voluntary turnovers account for 161 cases, 137 turnovers are classified as forced, while in 7 and 8 cases, turnovers are caused by death or health issues, respectively. Voluntary turnovers occur when executives move to a new job (76 out of 161 cases) or retire (85 out of 161). Forced turnovers occur due to poor performance (44 cases), strategic differences (29 cases), and criminal activity (5 cases).[6] Finally, 59 executive turnovers are

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[5] Note that total income equals the sum of labor income, entrepreneurial profits, financial income, and other income. For CEOs with high interest expenses due to large mortgages, financial income can be negative, which implies that total income is lower than the labor income.

[6] All but one of the turnovers involving criminal activity is the result of insider trading. Thus, this study has little to say about the consequences to managers of financial misrepresentation. Instead we refer to Karpoff, Lee, and Martin (2008), who study the consequences to managers of financial misrepresentation.

"reclassified" as forced because the announcement does not report the reason to be death, poor health, or a new job, or because retirements are announced less than 6 months before departure.

Table II reports descriptive statistics for all active executives, and executives with a voluntary or forced turnover. The average executive is 52.3 years of age and has been in office for 7.8 years. Almost all CEOs are male (98.2%) and married (92.1%). Outgoing executives tend to be older, and the company's operating performance and stock return tend to be lower than for executives who stay in office. In keeping with prior literature, the difference in performance is driven by forced turnovers. Firm performance is systematically lower for CEOs who are forced out than for those who depart voluntarily. Finally, executives who are forced out tend to be younger and less experienced than CEOs who leave voluntarily.

An important preoccupation of prior studies is tracking the employment status of ousted executives following their turnovers. This practice can be difficult because most ousted executives do not end up working for public companies. Executives might seek employment in private firms, become self-employed, retire or remain unemployed, making correctly classifying the employment status inherently difficult. In contrast, the Danish administrative register data track the entire population irrespective of its employment status. The employment status of each individual is classified at the end of November based on the labor market status in the first 11 months. Individual are classified as employed if the majority of their personal income is from paid employment, and as self-employed when the majority of their personal income is from self-employment. Individuals outside the labor market are classified as "retired" if the majority of their income is from private or public pensions. Finally, individuals are classified as unemployed if they are neither employed nor self-employed, and have not retired.

Table III reports the employment status following forced turnovers. One important caveat is that the register data only track the employment status of residents. If executives move abroad, their employment status is thus unobserved. We therefore start by reporting the tax status of

executives around forced turnovers. Residents have full tax liability, while non-residents have partial tax liability of income earned from sources in Denmark.

Panel A of Table III reports the tax liability and, thus, the residence status of executives following forced turnovers. In the year prior to the dismissal, 132 out of 137 executives were also residents with full tax liability, while 5 were non-residents with limited tax liability. After the forced turnovers, a few executives decided to move abroad. The maximum number of ousted executives residing abroad reaches 11 two and three years after the turnover, and falls to 9 four and to 7 five years after the turnover. Notably, while tax authorities only have access to income data reported by third parties from domestic sources, whereas income from foreign sources are self-reported, very few executives changed their tax liability status by moving abroad after the forced turnover. As 5 out of 11 executives with limited tax liability were already non-residents before the turnover, the potential bias resulting from unobserved foreign income is likely to be small.

Panel B of Table III documents the employment status of executives with forced turnovers. Most ousted executives remain active in the labor market. Five years after they were ousted, 108 out of 137 (79%) executives are either employed or self-employed. Unemployment remains relatively low, varying between 5% and 9%, while the remaining executives either retire (7%), move abroad (5%), or die (4%).

Panel C of Table III reports the average age conditional on the labor market status. The average age bolsters the accuracy of the employment status assigned by Statistics Denmark based on the income data. Among the ousted executives, the younger remain active in the labor market, while the older decide to retire. This finding highlights the importance of analyzing the interaction between personal income and age to differentiate between income effects driven by labor markets outcomes and early retirement decisions.

Table IV provides descriptive statistics on the personal income around executive turnovers. We focus on the pre-turnover period from year -5 to -1, the year of the turnover (year 0), and the post turnover period from year +1 to +5. Average total income, labor and entrepreneurial income, financial income, and other income are reported for voluntary and forced turnovers depending on the turnover type in panels A to D, respectively. Executives with voluntary turnovers resulting from a new job earned about 15% more after turnover, as average total income increases from DKK 3,128,200 (EUR 419,900) to DKK 3,628,900 (EUR 481,000). The increase of DKK 455,700 is statistically insignificant. Executives who retire earn DKK 1,917,700 (EUR 257,400) after retirement compared to DKK 2,841,700 (EUR 381,400) before, which is equivalent to a drop in income of 32.5%. Executives with forced turnovers also earn substantially less after turnovers. Executives who are forced out due to performance, differences in strategy, or crime earn, on average, DKK 1,304,000 (EUR 175,000) after the turnover compared to DKK 1,824,000 (EUR 244,800) before the turnover. The decline of DKK 520,000 is statistically significant at the ten percent level. Thus, total income is 28.5% lower on average in the five years following a forced turnover than in the five years prior to the turnover event. We find smaller declines in total income for turnovers that are reclassified as forced due to incomplete disclosure of the cause of termination: total income declines by DKK 128,500 (EUR 17,200) from DKK 1,625,000 (EUR 218,100) to DKK 1,496,500 (EUR 200,900).

Most of the decline in total income for executives with forced turnover in Panel A of Table III can be attributed to lower labor income. Panel B shows that labor and entrepreneurial incomes decline by more than the decline in total income, whereas financial income tends to increase. Forced turnovers due to disclosed and undisclosed causes result in DKK 761,300 (EUR 102,200) and DKK 269,900 (EUR 36,200) lower labor and entrepreneurial income, respectively. Finally, Panel C shows that financial income increases around forced turnovers, thereby partly attenuating the decline in income.

In summary, Table III provides evidence consistent with forced executive turnovers being costly for executives as total income declines. Labor and entrepreneurial income accounts for the entire drop, while financial income increases due to realized capital gains. The decline in total income is, thus, mitigated by selling assets with capital gains.

Figure II plots average total income and labor and entrepreneurial income in year -5 to year +5 relative to the forced turnover. Panel A of Table II shows that ousted CEOs' income increased from around 1.4 million to 2.6 million in the period from 5 years before turnover to the year of departure. In the five years following the forced turnover, total income is significantly lower and declining. In the year immediately following the forced turnover, ousted CEOs earn on average 1.7 million, which declines to 1.3 million five years after the departure. Income in the first two years following the firing tends to be higher because of severance pay, which rarely extends more than two years beyond termination of employment (Yermack, 2006; Rusticus, 2006). Panel B of Figure II shows that most of the effect on total income is driven by labor and entrepreneurial income. Labor income increases significantly before turnover from 1.4 million to 2.2 million, and rapidly decreases in the five years following the turnover, ending below 1 million. Ousted executives seem to earn significantly less following their departures.

To illustrate that the drop in income for ousted executives is not driven by outliers, Figure III shows the cross-sectional distribution of the executives' ability to recover their income. Panel A of Figure III reports the fraction of ousted CEOs who, in the five years following their departure, recover 50%, 75%, or 100% of the labor income they earned as CEOs. Panel A shows the recovery rates relative to the CEO's income in the year before being ousted (year -1), while Panel B shows recovery rates relative to the CEO's average income in the five-year period before being ousted (year -5 to year -1.)

Only around 40% of all dismissed CEOs manage to earn a labor income that is half of their pre-departure labor income, and less than 20% of all ousted CEOs end up earning more.

While the fractions increase slightly when we benchmark future labor income to the average labor income in the five years before their dismissal, recovery rates still remain low. More than half of the ousted CEOs earn less than half of their previous salary, and only 22% end up earning more. Collectively, Figure III demonstrates that the distribution of income suffers a dramatic downward shift. Few ousted executives manage to stage a comeback and fully recover their income, while the majority of ousted executives face reductions in income of at least 50%. These results support the focus of the literature on executive turnovers as an important internal corporate governance mechanism, but also motivate the more careful econometric analysis of the personal cost of executive turnovers that we undertake in the next section.

II. Personal costs of executive turnovers

To estimate the personal cost of executive turnovers, we follow the labor economics literature on earnings losses of displaced workers (Jacobsen, LaLonde, and Sullivan, 1993) and estimate the relationship between the income and individual characteristics around executive turnovers. The main equation for estimating the personal cost of executive turnovers is specified in Equation (1), where the dependent variable is the log income, y_{it}, of individual i in year t:

$$y_{it} = \alpha_i + \gamma_t + \delta F_{it} + \epsilon_{it}, \tag{1}$$

the parameters α_i represent individual fixed-effects, γ_t represents a set of yearly indicator variables, and F_{it} is an indicator for forced executive turnovers. The parameter δ captures the impact of forced turnovers, while ϵ_{it} is the error term. In all specifications, standard errors are clustered at the individual level.

Table V reports the estimated personal cost of forced executive turnovers, δ. In Column 1 we regress log. of total income on the indicator for forced turnovers, F_{it}. The coefficient of -0.506 implies that total income is 1-exp(-0.506) = 40% lower on average in the five years following turnover. The negative effect of forced turnovers on total income declines to 34% when we include, in Column 2, individual fixed effects. This specification effectively controls for time-invariant individual characteristics, which might be priced in the executive labor market. For instance, Adams, Keloharju, and Knüpfer (2016) show that a CEO's cognitive, as well as non-cognitive, abilities can explain about 10% of the CEO pay premium. The inclusion of individual fixed effects thus implies that we benchmark the post-turnover income of each individual to the income they obtained as CEOs. In Section IV, we will consider an alternative benchmark using the income of the replacement CEO.

In columns 3 and 4, we address two main caveats of our sample by including only individuals who maintain their full tax liability (Column 3) and individuals who remain full-time employed (Column 4). For these subsamples, we obtain coefficients of similar magnitude. Income declines by 36 percent when we condition the sample of tax liability and by 33 percent if we require individuals to be full-time employed. We note, however, that while the last subsample addresses concern about early retirement, it also excludes individuals who are unemployed.

In columns 5 and 8, we use log. of labor and entrepreneurial income as the dependent variable. The estimated coefficients in Column 5 of -0.763 implies that, following forced turnovers, labor income drops by 51%. When we include individual fixed effects in Column 6, we find a negative effect on income of 45%. By comparing the estimated coefficients in columns 1 to 4 to the coefficients in columns 5 and 8, we note that labor and entrepreneurial income declines by more than total income. This finding bolsters our interpretation of the decline in income as resulting from labor market outcomes. In summary, Table V finds that forced turnovers carry significant personal costs to the CEO in the form of lower personal income.

Given the substantially lower personal income associated with forced executive turnovers, it is natural to ask whether the cost is enforced by the executive labor market. If forced turnovers carry a personal cost in the executive labor market, one would expect the cost to be positively related to firm performance during the tenure of the ousted executive. Table VI reports results where the indicator for forced turnovers is interacted with firm performance.

Table VI provides evidence consistent with a personal cost in the executive labor market. In Column 1, we interact the indicator for forced turnovers with the market-adjusted stock return in the 12 months prior to dismissal, and find that personal costs of executive turnover vary with firm performance. The estimated coefficients imply that a one standard deviation increase in firm performance prior to being dismissed reduces the personal cost by around 5.7%.

An important concern when estimating the personal cost of executive turnovers is whether the estimates are confounded by industry shocks. For instance, Jenter and Kanaan (2015) show that CEOs are dismissed after poor industry performance as well as idiosyncratic firm performance. To address the concern that the estimated personal cost is driven by industry shocks that affect both turnover and future income, we decompose firm performance into an idiosyncratic component and an industry component following Jenter and Kanaan (2015). The two components are obtained by estimating the relationship between firm's stock returns and the average industry stock return (excluding the firm):

$$r_{it-1} = \alpha + \beta r_{industry,t-1} + \epsilon_{it-1}. \tag{2}$$

From this regression we decompose firm performance into an industry component, $\hat{\beta} r_{industry,t-1}$, as well as the idiosyncratic component of firm performance, $r_{it-1} - \beta r_{industry,t-1}$. We refer to these components of the stock return as *industry stock return* and *idiosyncratic stock return* and interact them with the indicator for forced turnovers. We use two

industry benchmarks: Fama-French 10 industry classifications and Fama-French 17 industry classifications, and report results in Column 2 and Column 3 of Table IV.

In Column 2, the indicator for forced turnover remains negative and statistically significant. Forced turnovers with high idiosyncratic stock return are associated with lower personal costs of forced turnovers as indicated by the positive and statistically significant interaction term. Thus, we find larger personal costs for CEOs with poor idiosyncratic firm performance. Interestingly, industry stock returns do not systematically affect personal costs, as the interaction term between forced turnover and industry return is insignificant. Again, we find consistent results in Column 3 when we use Fama-French 17 industry classifications to estimate the industry component of the stock return in Equation (2).

Columns 4 to 6 repeat the analysis in columns 1 to 3 by considering firm performance over the prior 24 months. Consistent with the prior results, we find that the interaction term between forced turnover and firm performance is positive and statistically significant. Columns 5 and 6 again show that this relationship is driven by idiosyncratic firm performance, rather than industry effects.

Collectively, the results in Table VI show larger declines in income for executives with poor idiosyncratic firm performance during the tenure, which is consistent with the personal cost being imposed by the executive labor market. More importantly, these results are inconsistent with a number of alternative explanations for why personal income might decline following forced turnovers. Section IV will discuss these alternative explanations in detail.

III. Interpretation and external validity

A. Personal cost conditional on age

An important concern with estimating the cost of executive turnover is whether ousted CEOs remain active in the labor market. If ousted CEOs because of age decide to retire, they will mechanically earn less, raising concerns about the interpretation of the estimated coefficients. The potential concern about the confounding effect of retirement is somewhat alleviated by the fact that executives with forced turnovers are on average 50.6 years at the time of the turnover, and thus, significantly years younger than the official retirement age of 65. Personal costs remain large if we condition the sample on executives who remain active in the labor market after the turnover (see columns 4 and 8 of Table V). To further ascertain that the personal cost of executive turnovers is not driven by early retirement or retirement on the job, Table VII provides estimates of the personal costs conditional on age.

In Column 1 we restrict the sample to executives who are fired before they turned 55 years. The coefficient of -0.370 implies that personal income is 31% lower among mid-aged executives. In Column 2 of Table VII, we include five interactions between forced turnover and indicators for age interval. In this specification, each interaction term estimates the effect of forced turnover personal income for the relevant age group. Column 2 of Table VII shows that the personal costs of forced turnovers, result in significantly lower total income for executives who are aged above 45 when they are ousted. The decline in personal income is estimated to be 32%, 41%, 54%, and 57% for executives aged 45 to 50, 50 to 55, 55 to 60, and over 60, respectively. It follows that while we find evidence of larger discounts for executives closer to retirement, we still find large personal costs for mid-aged executives.

We find similar results when we repeat, in columns 3 and 4, the exercise using labor and entrepreneurial income as dependent variables. Thus, while early retirement may contribute to the lower income, the majority of the effect seems to be driven by lower labor income in the new position.

B. Classification of forced turnovers

In classifying turnovers as forced we follow the classification methodology of Parrino (1997), which has become widely used in the literature on executive turnovers. Forced turnovers due to poor performance or differences in strategy rely on either corporate announcements or news reports citing these as reasons for the turnover. Turnovers that are reclassified, on the other hand, are classified as forced because the corporate announcement or news reports fail to provide a coherent reason for the turnover. The difference in forced turnover types in relation to firm performance makes examining whether the personal costs varies with the underlying turnover type interesting. If the executive labor market penalizes poor performance, we would expect to find larger personal costs for turnovers due to poor performance, whereas labor markets assessment of the personal cost of turnovers due to differences in strategy might be more lenient. Finally, our sample provides an opportunity to perform an out-of-sample test of Parrino's classification methodology in relation to turnovers reclassified as forced.[7] Figure IV reports the results.

Figure IV shows the estimated personal cost of forced turnovers for all turnovers and whether the forced turnover results from poor *performance*, *differences in strategy*, or alternatively is *reclassified* as forced by the classification methodology (see Section II and discussion of Table I). Figure IV shows that forced turnover due to poor performance result in the largest personal cost, whereas forced turnover due to differences in strategy results in the lowest personal cost. Cases that are reclassified, because the corporate announcement and news reports fail to provide sufficient information, are also associated with large personal costs. All effects are economically as well as statistically significant. The evidence in Figure IV bolsters the interpretation that the executive labor market penalizes poor performance, while turnovers due to disagreement on

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[7] It should be noted that the classification of turnover types by the author occurs before the data is anonymized by Statistics Denmark and, thus, is determined before Statistics Denmark gives access to the income data.

future strategy lead to lower personal costs. Finally, we note that Parrino's (1997) classification mechanism performs well in our out-of-sample test, as we find large personal costs of turnovers that are reclassified as forced.

C. Implications for executive compensation

The magnitude of the personal costs of executive turnovers also has implications for the ongoing debate on the level of executive compensation. Executive turnovers constitute a risk factor for CEOs, which might be priced in the executive labor market. A risk-adverse CEO's participation constraint induces executive compensation to be increasing in the risk of being dismissed (i.e., the probability of forced turnover) and the personal cost of forced turnovers. Consistent with this idea, Peters and Wagner (2014) document that executive compensation has increased in response to higher incidence of executive turnovers due to tightening of corporate governance regimes in recent years. In addition, Peters and Wagner (2014) use a simple model of lifetime utility o calibrate the risk premia due to executive turnovers. The calibration has three free parameters of interest for this study: the degree of relative risk aversion, the probability of being fired, and the personal cost of executive turnovers. Intuitively, the risk premia is increasing in all three parameters.

The estimated personal cost of executive turnovers of 35% to 45% in the prior analysis allows for a more precise characterization of how executive turnovers may affect executive compensation. For reasonable degrees of CEO risk aversion, Peters and Wagner (2014) estimate that a one percentage point increase in dismissal risk results in a turnover risk premium of between 3.5% and 10% when varying the personal cost of turnover between 20% and 75%.[8] The estimated personal cost of around 40% in this study suggests that a one percent increase in the

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[8] The turnover risk premium is calculated as a certainty equivalent for an executive with risk aversion parameters between 2 and 3, and personal cost from forced turnover ranging from 20% to 75%.

dismissal risk results in a turnover risk premium of 3.2% to 4.2%. Combining this estimate with the documented increase in turnover risk of about 4 percentage points over the last two decades (Kaplan and Minton, 2012), suggests that the executive turnover risk premium in isolation has contributed to the rising executive compensation by 12 to 16 percentage points. The magnitude of the risk premia also reinforces the view emphasized in the theoretical literature, that executive turnover is an important incentive mechanism for executives.

D. External validity

An important question is the external validity of the results. This study's focus on the managerial labor in Denmark is motivated by the availability of high-quality register data. The Danish labor market is described by labor economists as being flexible, and generally allows workers to find jobs after displacements. For instance, the effect of displacement of (ordinary) workers on future income in Denmark is estimated to be 6%, which is comparable to other Nordic countries but significantly below the 13% to 25% range for the United States (see Table A in the Appendix and references herein).

The important question is, though, whether the managerial labor market is different from the general labor market. For instance, employment opportunities for ousted executives of publicly listed firms might be affected by the distribution of firm size in the economy and whether privately held firms of comparable magnitude exist. If the distribution of firm size is highly dispersed and skewed, forced turnovers might be costlier because publicly listed firms tend to be larger, and executive compensation is increasing in firm size. Prior research has documented that the dispersion and skewness of firm size in Denmark is on par with other European countries like the United Kingdom, but smaller than that of the United States (Poschke, 2015). To further shed light on the external validity of the results, we examine the fraction of publicly listed firms to all firms across the distribution of firm size. Using data from

Amadeus on firms with more than 50 employees, Figure A in the appendix shows the fraction of publicly listed firms to all firms across the distribution of firm size for 6 countries: Denmark, France, Germany, Netherlands, Sweden, and the United Kingdom. We use book value of asset to measure firm size, and report the fraction of publicly listed firms to all firm for bins of book value of assets in USD billion in 2014: <0.1, 0.1 to 0.5, 0.5 to 1, 1 to 2.5, 2.5 to 5, 5 to 10, and >10, respectively. The sample includes 202,087 firms, of which 4,676 are from Denmark.

Figure A shows that the fraction of publicly listed firms to all firms across the distribution of firm size in Denmark is comparable to Germany and United Kingdom, but lower than France and Sweden. This finding suggests that ousted executives in Denmark have the same or better outside job opportunities than executives in other European economies. Finally, it should be noted that while the magnitude of the estimated cost of personal turnover might be specific to labor market conditions in Denmark, the cross-sectional evidence of the relationship between firm performance and the cost of turnover is unlikely to be affected by these concerns. The cross-sectional evidence shows that executives with low idiosyncratic firm performance have higher personal costs of turnovers, while performance factors beyond the control of the executive have no significant effect on future income.

IV. Alternative specifications and robustness checks

Finally, Table VIII provides a number of alternative specifications and robustness checks to the preceding analysis.

A. Benchmarking to replacement CEO

The prior analysis estimates of the personal costs of executive turnovers using a specification with individual fixed effects to control for CEO traits that might be priced by the

executive labor market. This specification benchmarks post-turnover income of each executive to his or her own pre-turnover income. As an alternative benchmark, we now consider the income of replacement CEO. One interpretation of this counterfactual is that the replacement income provides an estimate of the income that the ousted CEO would have earned if the CEO had not been fired. The alternative benchmark is thus helpful in ruling out, that the estimated personal cost of forced turnovers are driven by firm specific shocks, that would have affected CEO income irrespective of the turnover. We therefore add observations on the replacement CEO's income to the sample of forced turnovers, and replace the individual fixed-effects with firm-year fixed effects.[9] Columns 1 and 2 of Table VIII report the results.

In Column 1 we find a larger personal cost of executive turnovers when we alternatively use the replacement CEO's income as benchmark for ousted CEO's post-turnover income. The coefficient of interest reveals that the ousted CEO on average earns 42% less than his replacement. Column 2 documents that this effect is driven by lower labor and entrepreneurial income. Ousted CEOs earn 63% less in labor income than his replacement. We note that the larger estimated personal costs are consistent with the observed pattern in Figure 1, which shows an upward trend in the level of CEO compensation over time. We therefore conclude that the estimated personal cost of forced turnovers cannot be driven by firm specific shocks, because we find larger personal costs when we use the replacement CEO's income as a benchmark for the ousted CEO's post-turnover income.

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[9] To be able to estimate the personal cost of forced turnovers using the replacement as benchmark, we retain the firm identifier for the ousted CEO in the post-tunover period. As a result the dataset includes two observations for each firm-year: one observation with ousted CEO's income and one observation with the replacement CEO's income. By including firm-year fixed effects in the regression on forced turnover on income, we effectively use the replacement CEO's income as benchmark for the ousted CEO's income in the post-turnover period.

B. Severance pay

Prior research has examined the extent to which executives receive golden handshakes or whether executive employment contracts include ex-ante separation agreements. For instance, Yermack (2006) finds that golden handshakes are common in the United States, but usually modest in value. Similarly, Rusticus (2006) finds that ex-ante separation agreements are common, and equivalent to two years cash compensation for the typical CEO. To address concerns about severance pay being paid out immediately after the forced turnover, we include the year of the turnover in the sample and code it as a post-turnover year. In Column 3 we estimate a personal cost of 23% for executive turnovers on total income when we include year 0 in the sample. Although the estimated personal costs are lower, the cause might be executives deciding to sell the stock they own in the company, hence realizing capital gains, which are included in financial income and, thus, total income. In Column 4 we therefore use labor and entrepreneurial income as dependent variable and estimate an effect of forced turnover of comparable magnitude to the main specification. Forced turnovers result in 39% lower labor income—even when we include Year 0.

C. Effect of the global financial crisis

To address the issue of whether turnovers in the later part of the sample period are driving the results due to the effect of the global financial crisis, we split the indicator for forced turnover into two depending on the year of the turnover and present the results in columns 5 and 6. We note that the personal costs of forced turnover are negative and statistically significant for turnovers that occur in both the first and second half (turnover before 2001, and after 2001) of the sample period. Although a small economic difference exists in the magnitude of the estimated personal costs, the difference is not statistically significant. Overall, Table VIII shows that our results are robust to alternative specifications and sample selection.

VI. Conclusions

This study has estimated the personal cost of executive turnovers using income and wealth data from the official records at the Danish Tax Authorities. These data are particularly advantageous for the analysis because they allow us to systematically observe executives' income after turnover, irrespectively of their future career paths.

We follow prior literature and distinguish between voluntary (due to a new job or retirement) and forced turnovers (due to performance or differences in strategy), and examine the effect of forced turnovers on personal income. We find that forced turnovers result in substantially lower income: personal income is 35%-45% lower in the five years following forced turnover. The personal cost is related to the stock price performance during the executives' tenure: personal costs are higher for executives of firms who underperformed the market during their tenure, and smaller for executives who outperformed the market.

Our findings have relevance beyond the context of this study. We believe that the results highlight the importance of executive turnovers as an important internal governance mechanism. If personal costs are significant, dismissals become a credible threat, providing incentives to reduce agency problems ex-ante. High personal costs also have implications for the level of executive compensation. Peters and Wagner (2014) document that executive compensation has increased in response to a higher incidence of executive turnovers due to tightening of corporate governance regimes in recent years. Higher incidence of executive turnovers would only result in higher compensation ex-ante if the personal costs of forced turnovers are significant. To this end, this study provides compelling evidence in support of this channel. Finally, the findings of this study also demonstrate that one cannot evaluate the importance of dismissals, as sources of CEO incentives, based only on the sensitivity between performance and turnover. Our findings reinforce the important role of executive turnovers as a threat to discipline managers when firm

performance is low. This result is particularly valid because we find that the personal costs of forced turnovers are related to the idiosyncratic performance of the firm during the tenure of the executive.

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Table I.
Executive turnovers from 1995 to 2007

This table reports the number of executive turnovers for firms listed on Copenhagen Stock Exchange from January 1, 1995 to December 31, 2007. Panel A shows the number of executive-firm years with and without executive turnovers. Panel B classifies executive turnovers into *voluntary* turnovers and *forced* turnovers following Parrino (1997). Voluntary turnovers occur when executives move to a *new job* or *retire*, while forced turnovers occur when executives are ousted due to poor *performance*, differences in *strategy*, or *crime*. Residual cases are "*reclassified*" as forced whenever the CEO is under the age of 60 and the company announcement or news report does not report the reason to be death, poor health, acceptance of another position, or when the CEO is retiring, but the company does not announce the retirement date at least 6 months before departure. For further details, see Parrino (1997). Finally, Panel B reports the number of turnovers due to *death* or *health* issues.

	1995	1996	1997	1998	1999	2000	2001	2002	2003	2004	2005	2006	2007	All
A. Executive turnover														
Yes	17	19	29	32	36	36	21	24	15	20	18	17	29	313
No	237	242	233	243	243	233	226	203	186	178	171	179	176	2,750
Turnover frequency	6.7%	7.3%	11.1%	11.6%	12.9%	13.4%	8.5%	10.6%	7.5%	10.1%	9.5%	8.7%	14.2%	10.2%
B. Executive turnovers by type														
Voluntary	9	9	17	19	17	16	12	9	6	12	8	13	14	161
New job	4	1	7	9	7	11	6	5	3	6	4	7	6	76
Retirement	5	8	10	10	10	5	6	4	3	6	4	6	8	85
Forced	7	10	9	12	17	17	9	14	8	8	9	2	15	137
Performance	0	5	1	6	4	5	4	5	2	4	2	0	6	44
Strategy	1	0	2	2	5	5	2	1	3	3	1	0	4	29
Crime	0	1	0	0	1	1	1	0	0	0	0	0	1	5
Unspecified (reclassified)	6	4	6	4	7	6	2	8	3	1	6	2	4	59
Death	1	0	1	0	2	0	0	1	0	0	1	1	0	7
Health	0	0	2	1	0	3	0	0	1	0	0	1	0	8

Table II.
Executive and firm characteristics

This table reports descriptive statistics for all executives depending on executive turnover and the turnover type. Executive turnovers are classified into voluntary turnovers and forced turnovers following Parino (1998). Voluntary turnovers occur when executives move to a new job or retire, while forced turnovers occur when executives are ousted due to poor performance, differences in strategy, crime, or whenever the announcement does not report the reason to be death, poor health, acceptance of another position, or retirement announced more than 6 months before departure. The level of observation is executive-firm years. Panel A reports means of the following executive characteristics: *age* (years), *tenure (*years), *education* (years of schooling), and *gender* (% male). Panel B reports means of the following firm characteristics: *market capitalization* (in million DKK), *book-to-market* (book value of assets over market value of equity plus book value of debt), *return on assets*, *dividend* (indicator for paying dividends), *stock return* over the prior 12- and 24-months, *tenure performance* (annualized stock return during tenure), and *tenure performance quintile* (quintile of annualized stock return during tenure). For executives with a turnover stock return and tenure, performance is calculated in the period prior to the announcement. *Difference* is a *t*-test of equal means. ***, **, and * denote significance at the 1, 5, and 10 percent levels, respectively.

	All	Turnover			Turnover type		
		Yes	**No**	**Difference**	**Forced**	**Voluntary**	**Difference**
		(1)	**(2)**	**(1)-(2)**	**(3)**	**(4)**	**(3)-(4)**
A. Executive characteristics							
Age (years)	52.3	54.5	52.1	2.5***	50.4	57.9	-7.4***
Tenure (years)	7.8	9.0	7.7	1.3***	5.7	12.0	-6.4***
Education (years of schooling)	15.3	15.5	15.3	0.2	15.6	15.4	0.3
Gender (% male)	98.2	98.0	98.2	-0.2	98.6	98.1	0.4
Married (%)	92.1	89.8	92.4	-2.6	88.3	91.3	-3.0
B. Firm characteristics							
Market capitalization (million DKK)	3906.2	3935.7	3902.8	32.9	2780.4	5208.7	-2428.3
Book-to-market	1.87	1.59	1.90	-0.30**	1.46	1.68	-0.21
Return on assets (%)	2.31	-1.60	2.76	-4.36	-4.3	0.3	-4.57
Dividend	58.4	52.4	59.2	-6.7**	35.0	65.8	-30.8***
Stock return over past 12 months (%)	13.9	7.4	14.7	-7.3**	2.5	13.4	-10.9*
Stock return over past 24 months (%)	32.1	17.4	33.8	-16.4***	-0.7	33.7	-34.4***
N	3,063	313	2,750		137	161	

Table III.
Tax and employment status around forced turnovers

This table reports the tax and employment status around forced turnover. We report the status the year before the forced turnover (year -1), and the five years following the forced turnover (year 1 to 5). Executive turnovers are classified into voluntary turnovers and forced turnovers, following Parrino (1998). Voluntary turnovers occur when executives move to a new job or retire, while forced turnovers occur when executives are ousted due to poor performance, differences in strategy, crime, or whenever the announcement does not report the reason to be death, poor health, acceptance of another position, or retirement announced more than 6 months before departure.. Panel A reports the tax status: residents have full tax liability, while non-residents have limited tax liability. For individuals with full tax liability, all sources of income (domestic and foreign) are taxed in Denmark, whereas individuals who have limited tax liabilities only pay tax on income from sources in Denmark. Panel B reports the employment status in the IDA database in Statistics Denmark. The IDA database classifies individuals' labor market participation at the end of November each year. Based on their primary source of income, individuals are either classified as *employed, self-employed, unemployed, retired, living abroad*, or *deceased*. For instance, individuals are classified as self-employed whenever more than half of their personal income derives from self-employment rather than paid employment. The labor market status of individuals living abroad is unobserved. Finally, Panel C reports the average age by employment status.

	Before	After				
		Year 1	**Year 2**	**Year 3**	**Year 4**	**Year 5**
A. Tax liability						
Full	132	128	124	124	123	125
Limited	5	8	11	11	9	7
Deceased	0	1	2	2	5	5
All	137	137	137	137	137	137
B. Employment status						
Employed	132	106	102	101	92	102
Self-employed	0	9	10	8	13	6
Unemployed	0	9	7	8	12	8
Retired	0	4	5	6	6	9
Living abroad	5	8	11	11	9	7
Deceased	0	1	2	3	5	5
All	137	137	137	137	137	137
C. Average age by employment status (excluding deceased)						
Employed	49.4	50.9	51.2	51.9	53.0	54.2
Self-employed	-	50.2	54.0	55.9	55.2	54.2
Unemployed	-	49.9	51.6	51.5	52.0	50.8
Retired	-	62.5	63.6	64.3	65.3	63.3
Living abroad	47.0	52.1	53.7	55.5	55.4	57.3
All	49.4	51.2	52.1	53.0	53.8	54.8

Table IV.
Personal income around executive turnovers

This table reports the mean personal income around executive turnovers by type of turnover. Executive turnovers are classified into voluntary turnovers and forced turnovers, following Parrino (1998). Voluntary turnovers occur when executives move to a new job or retire, while forced turnovers occur when executives are ousted due to poor performance, differences in strategy, crime, or whenever the announcement does not report the reason to be death, poor health, acceptance of another position, or retirement announced more than 6 months before departure. Panel A reports the total income, which equals the sum of labor income, entrepreneurial income, financial income, and other income. Panels B, C, and D report mean labor and entrepreneurial income (income from paid employment and income from self-employment), financial income (realized capital gains, dividends, and interests received minus interest paid), and other income (perquisites, pension, and government transfers). All amounts are in 1,000 year-2000 Danish kroner (DKK). *Year 0* is the year of the turnover, while *year -5 to -1*, and *year 1 to 5* refer to five years before and five years after the turnover, respectively. *Difference* is the difference in average income five years before and five years after the executive turnover. *t*-stats are reported in parentheses. ***, **, and * denote significance at the 1, 5, and 10 percent levels, respectively.

	Turnover type			
	Voluntary		Forced	
	New job	**Pension**	**Disclosed cause**	**Undisclosed cause**
A. Total income (1,000 DKK)				
Year -5 to -1	3,128.2	2,841.7	1,824.0	1,625.0
Year 0	5,156.8	3,237.2	2,811.3	2,184.2
Year 1 to 5	3,583.7	1917.7	1,304.0	1,496.5
Difference	455.7	-924.1***	-520.0*	-128.5
	(1.13)	(-4.86)	(-1.71)	(-0.65)
B. Labor and entrepreneurial income (1,000 DKK)				
Year -5 to -1	2,310.6	2,040.2	1776.1	1,296.4
Year 0	3,842.0	2,425.8	2,397.4	1,638.1
Year 1 to 5	2,425.8	831.4	1014.8	1,026.4
Difference	139.4	-1,208.8***	-761.3***	-269.9
	(0.39)	(-6.09)	(-2.82)	(-1.62)
C. Financial income (1,000 DKK)				
Year -5 to -1	633.0	389.9	-10.9	229.9
Year 0	967.2	551.4	359.6	322.4
Year 1 to 5	682.3	451.4	204.1	375.9
Difference	49.3	61.6	215.0*	146.1
	(0.41)	(0.29)	(1.70)	(1.23)
D. Other personal income (1,000 DKK)				
Year -5 to -1	184.6	411.7	58.8	98.7
Year 0	347.5	260.0	54.4	223.7
Year 1 to 5	451.6	634.9	85.1	94.1
Difference	267.0***	223.0	26.3	-4.6
	(3.17)	(1.21)	(0.95)	(-0.13)

Table V.
Personal cost of forced turnovers

This table estimates the personal cost of forced turnovers. In columns 1 to 4, the dependent variable is log. of total income. In columns 5 to 8, the dependent variable is log. of labor and entrepreneurial income. Total income is the sum of labor and entrepreneurial income, financial income, and other income. In columns 1, 2, 5, and 6, the sample consists of executives who experienced a forced turnover. The sample in columns 3 and 7 consists of executives who experience a forced turnover and maintain full tax liability, whereas the sample in columns 4 and 8 consists of executives who experience a forced turnover and maintain full tax liability and remain active in the labor marker (either through full-time employment or self-employment). The year of the executive turnover is excluded from all regressions. *Forced turnover* equals one in year 1 to 5 after the turnover. *t*-stats are in parentheses and standard errors are clustered at the individual level. ***, **, and * denote significance at the 1, 5, and 10 percent levels, respectively.

Dependent variable	Log. of total income				Log. of labor and entrepreneurial income			
Sample	All	All	Full tax liability	Full time employed	All	All	Full tax liability	Full time employed
Window	-5 to +5	-5 to +5	-5 to +5	-5 to +5	-5 to +5	-5 to +5	-5 to +5	-5 to +5
	1	2	3	4	5	6	7	8
Forced turnover	-0.506***	-0.416***	-0.452***	-0.407***	-0.705***	-0.594***	-0.507***	-0.414***
	(-4.09)	(-3.33)	(-3.76)	(-3.51)	(-5.33)	(-4.17)	(-4.17)	(-4.23)
Year fixed-effects	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Individual fixed-effects	No	Yes	Yes	Yes	No	Yes	Yes	Yes
R-squared	0.042	0.501	0.549	0.553	0.082	0.454	0.530	0.553
Number of executive-years	1,280	1,280	1,191	1,123	1,280	1,280	1,191	1,123

Table VI.
Personal cost of forced turnovers and firm performance

This table estimates the personal cost of forced turnovers as a function of firm performance 12 and 24 months before turnover using total income as the dependent variable. Total income is the sum of labor and entrepreneurial income, financial income, and other income. The sample consists of executives who experienced a forced turnover, and the year of the executive turnover is excluded from the regressions. *Forced turnover* equals one in year 1 to 5 after the turnover. *Market adjusted stock return* is calculated using a market model. *Idiosyncratic stock return* is the component of the stock return not predicted by the *industry stock return* (see Equation 2). Columns 2 and 5 (3 and 6) use Fama-French 10 (17) industry classifications to separate firm performance into an idiosyncratic and industry component. *t*-stats are in parentheses, and standard errors are clustered at the individual level. ***, **, and * denote significance at the 1, 5, and 10 percent levels, respectively.

Return benchmark	Market index	Fama-French 10 industries	Fama-French 17 industries	Market index	Fama-French 10 industries	Fama-French 17 industries
Window	-5 to +5	-5 to +5	-5 to +5	-5 to +5	-5 to +5	-5 to +5
	1	2	3	4	5	6
Forced turnover	-0.382***	-0.337***	-0.400***	-0.370***	-0.286***	-0.370***
	(-3.35)	(-3.23)	(3.13)	(-3.20)	(-2.22)	(-2.71)
Forced turnover * Market adjusted stock return (12-month)	0.224**					
	(2.27)					
Forced turnover * Idiosyncratic stock return		0.222**	0.227**			
		(2.32)	(2.37)			
Forced turnover * Industry stock return (12 months)		-0.358	0.173			
		(-0.93)	(0.33)			
Forced turnover * Stock return (24-month)				0.156**		
				(1.96)		
Forced turnover * Idiosyncratic stock return (24 months)					0.197**	0.176
					(2.51)	(2.22)
Forced turnover * Industry stock return (2 months)					-0.261	0.009
					(-1.20)	(0.03)
Individual fixed-effects	Yes	Yes	Yes	Yes	Yes	Yes
R-squared	0.504	0.505	0.504	0.503	0.505	0.504
N	1,280	1,280	1,280	1,280	1,280	1,280

Table VII.
Personal cost of forced turnovers and executive age

This table estimates the personal cost of forced turnovers as a function of executive age. In columns 1 and 2, the dependent variable is log. total income, while the dependent variable in columns 3 and 4 is log. labor and entrepreneurial income. Total income is the sum of labor and entrepreneurial income, financial income, and other income. Labor and entrepreneurial income is income from paid employment and entrepreneurial profits (if any). The sample consists of executives who experienced a forced turnover, and the year of the executive turnover is excluded from the regressions. In columns 1 and 2, the sample includes all forced turnovers. In columns 2 and 4, the sample includes only forced turnovers of executives aged below 55 at the time of the turnover. *Forced turnover* equals one in year 1 to 5 after the turnover. *Age 50+* and *Age 55+* are indicators for executives aged above 50 and 55 at the time of the turnover, respectively. *t*-stats are in parentheses, and standard errors are clustered at the individual level. ***, **, and * denote significance at the 1, 5, and 10 percent levels, respectively.

Dependent variable	Log. total income	Log. total income	Log. labor income	Log. labor income
Sample	Forced at age<55	Forced	Forced at age<55	Forced
Window	-5 to +5	-5 to +5	-5 to +5	-5 to +5
	1	2	3	4
Forced turnover	-0.370**		-0.430***	
	(-2.45)		(-2.83)	
Forced turnover at age <45		0.251		0.064
		(1.35)		(0.31)
Forced turnover at age 45-50		-0.385*		-0.369*
		(-1.72)		(-1.71)
Forced turnover at age 50-55		-0.523***		-0.502**
		(-2.64)		(-2.50)
Forced turnover at age 55-60		-0.776***		-1.089***
		(-4.04)		(-4.36)
Forced turnover at age 60+		-0.840***		-1.808**
		(-3.00)		(-3.29)
Individual fixed-effects	Yes	Yes	Yes	Yes
R-squared	0.451	0.532	0.457	0.504
N	862	1,280	862	1,280

Table VIII.
Alternative specifications

This table estimates the personal cost of forced turnovers using alternative specifications. In columns 1, 3, and 5 the dependent variable is log. total income, while the dependent variable in columns 2, 4, and 6 is log. of labor income. Total income is the sum of labor and entrepreneurial income, financial income, and other income. Labor and entrepreneurial income is income from paid employment and entrepreneurial profits (if any). In columns 1 and 2 the sample includes forced turnovers and the replacement CEO. In columns 3 to 6 the sample includes only forced turnovers. In columns 3 and 4, the year of executive turnover is included in the sample, whereas it is excluded in columns 1, 2, 5, and 6. *Forced turnover* equals one in the year of the turnover (if included) and from year 0 to 5 after the turnover. *Forced turnovers before 2001* is an indicator for turnovers before the end of year 2001, whereas *forced turnovers after 2001* is an indicator for forced turnovers after the end of 2001. *t*-stats are in parentheses, and standard errors are clustered at the individual level. ***, **, and * denote significance at the 1, 5, and 10 percent levels, respectively.

Sample	Forced + replacement	Forced + replacement	Forced	Forced	Forced	Forced
Dependent variable	Log. total income	Log. labor income	Log. total income	Log. labor income	Log. total income	Log. labor income
Window	-5 to +5	-5 to +5	-5 to +5	-5 to +5		
	1	2	3	4	5	6
Forced turnover	-0.551***	-1.007***	-0.267***	-0.497***		
	(-4.32)	(-5.98)	(-3.47)	(-5.59)		
Forced turnover before 2001					-0.425***	-0.637***
					(-3.14)	(-4.66)
Forced turnover after 2001					-0.336**	-0.653**
					(-2.89)	(-4.05)
Year fixed-effects	No	No	Yes	Yes	No	No
Individual fixed-effects	No	No	Yes	Yes	Yes	Yes
Firm-year fixed-effects	Yes	Yes	No	No	No	No
R-squared	0.910	0.871	0.551	0.533	0.489	0.450
N	2,495	2,495	1,409	1,409	1,280	1,319

Figure I. Average total income and labor income for active CEOs, 1990–2012.

This figure reports the mean total income and mean labor income for active CEOs of firms listed on Copenhagen Stock Exchange from 1990 to 2012. Total income is the sum of labor and entrepreneurial income, financial income, and other income. Amounts are in year 2000 thousand DKK. One DKK is equivalent to 7.45 Euro.
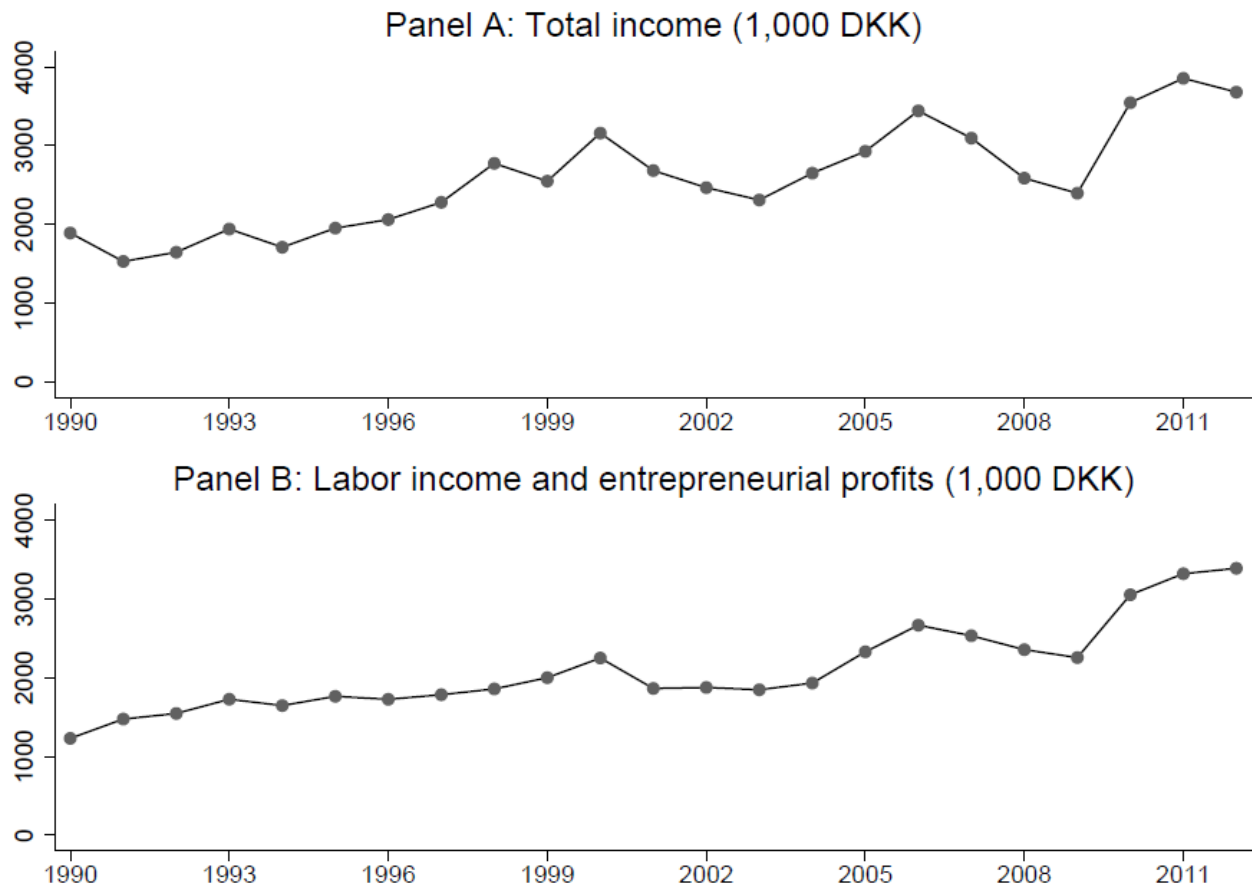
Figure II. Average total income and labor income around forced CEO turnovers

This figure reports the mean total income and labor and entrepreneurial income from year -5 to +5 around CEOs turnovers of firms listed on Copenhagen Stock Exchange from 1995 to 2007. The event year is the year of the turnover. Total income equals the sum of labor and entrepreneurial income, financial income, and other income. All amounts are in year 2000 thousand DKK. One DKK is equivalent to 7.45 Euro.
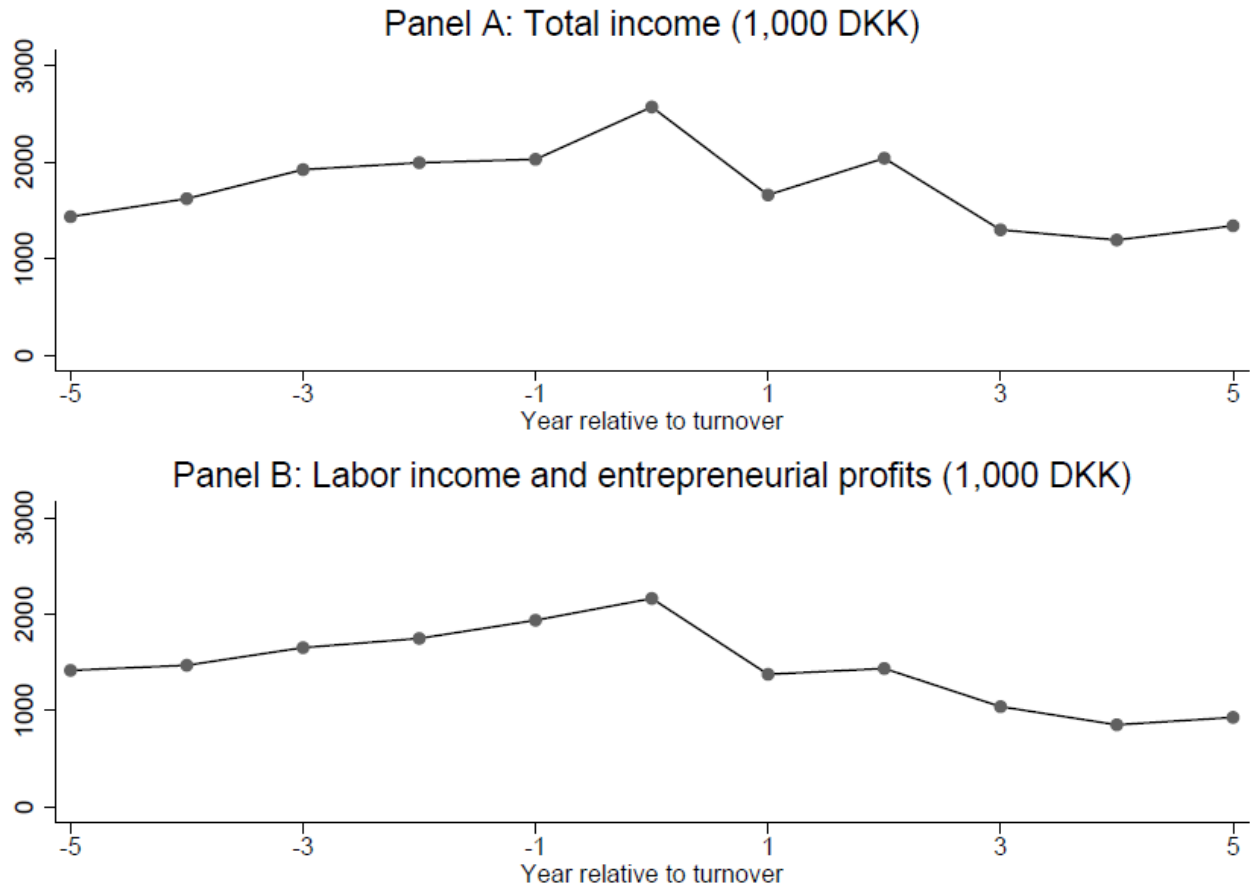

Panel A: Total income (1,000 DKK)

Panel B: Labor income and entrepreneurial profits (1,000 DKK)

Figure III. Fraction of ousted CEOs recovering 50%, 75%, and 100% of their income

This figure reports the average recovery of labor and entrepreneurial income after forced turnovers. Panel A shows the fraction of ousted CEOs who recover 50%, 75%, and 100+% of their labor and entrepreneurial income relative to their labor and entrepreneurial income in year -1. Panel B shows the fraction of ousted CEOs who recover 50%, 75%, and 100+% of their labor and entrepreneurial income relative to their average labor and entrepreneurial income in year -5 to -1.
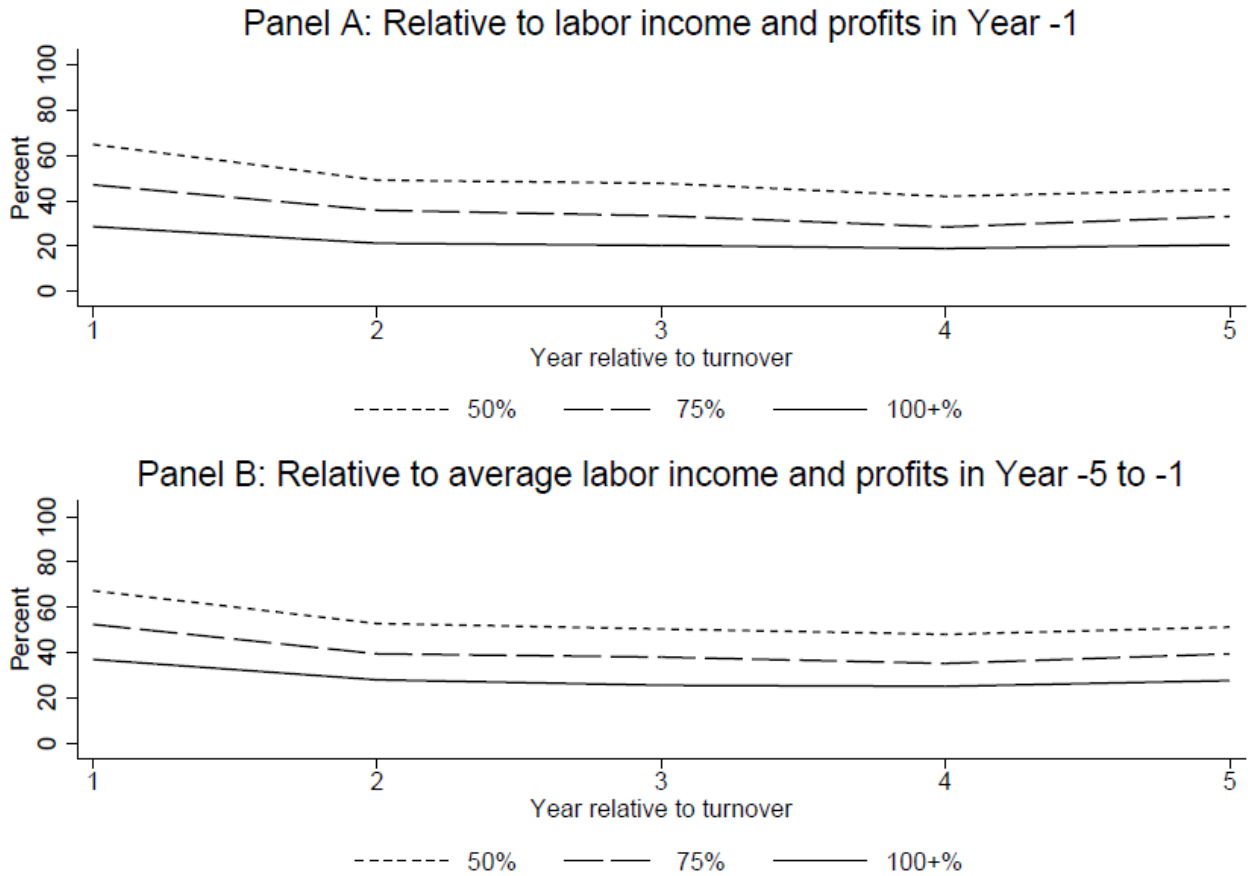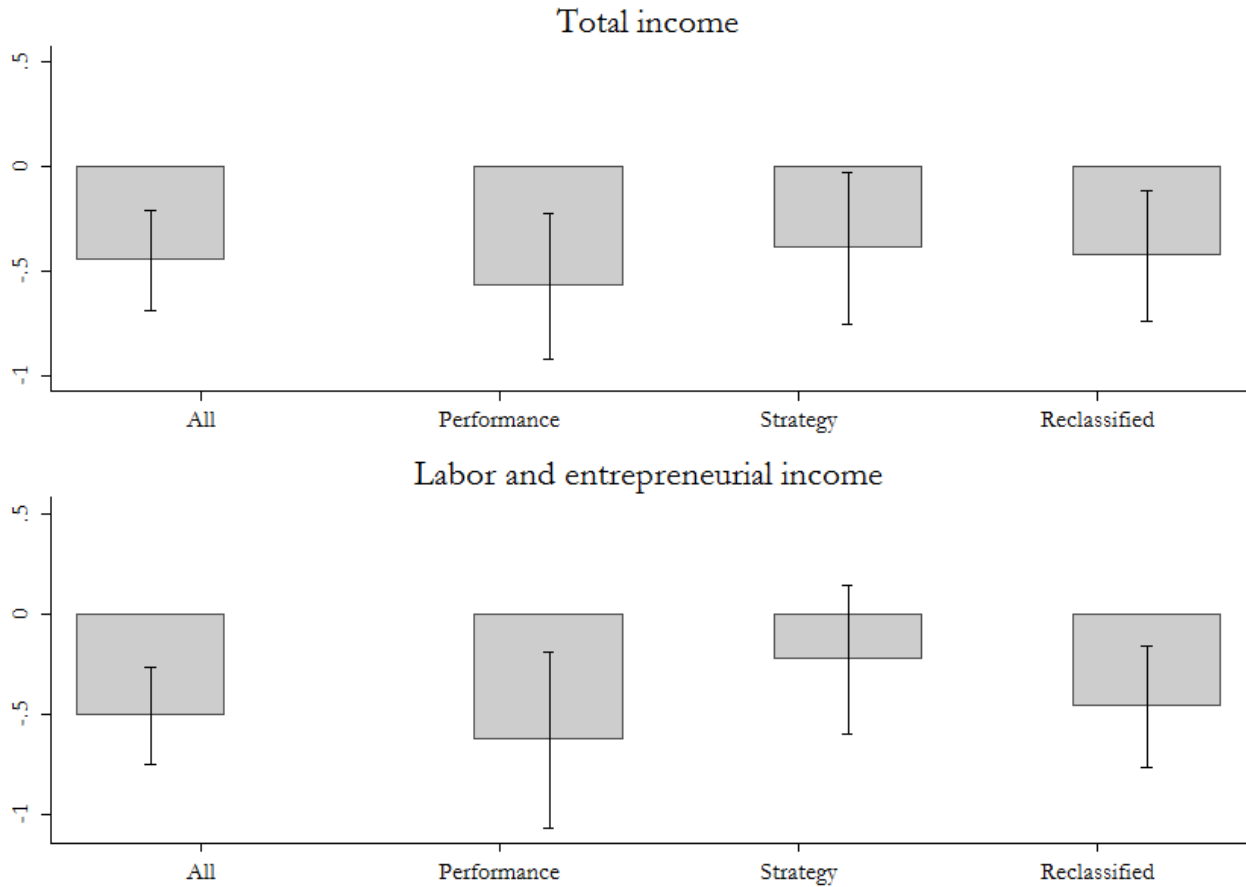
Figure IV. Estimated personal cost of forced turnovers and reason for turnover

This figure shows the estimated personal cost of all forced turnovers, and for subcategories of turnovers based on the stated reason for turnover. Forced turnovers are classified as turnovers due to poor performance or differences in *strategy*, or are *"reclassified,"* which refers to the residual cases of turnovers in which the CEOs is below the age of 60 and the company announcement or news report do not report the reason to be death, poor health, acceptance of another position, or when the CEO is retiring, but the company does not announce the retirement date at least 6 months before departure. For further details, see Parrino (1997).

Appendix to "Personal Costs of Executive Turnovers"

Table A. Displacement of workers and future income

This table provides an overview of results in prior studies for the effect of the displacement of workers on their future income. The estimated *effect on income* provides a reference point for the personal cost of executive turnovers from the general labor market. Horizon indicates thee periods over which the post-displacement income is analyzed. The column *study* provides the reference to the underlying study, estimating the effect on income.

Country	Effect on income	Horizon	Study
Germany	-3.5%	2 years	Couch (2001)
Norway	-5%	3 years	Huttenen et al. (2005)
Denmark	**-6%**	**3 years**	**Albæk et al. (2002)**
Finland	-4 to -9%	3 years	Eliason and Storrie (2006)
Italy	-10%	4 years	Rosolia (2002)
Canada	-13 to -20%	5 years	Bonikowska and Morissette (2013)
France	-20%	5 years	Bender et al. (2002)
United States	-13 to -25%	5 years	Jacobsen et al. (1993); Couch and Placzek (2010)

Figure A. Fraction of listed firms to all firms across firm-size distributions and countries

This figure shows the fraction of listed firms to all firms across the distribution of firm size measured by book value of assets for 6 countries: Denmark, France, Germany, Netherlands, Sweden, and the United Kingdom. The dataset is from Amadeus and includes all active companies with more than 50 employees in 2014. The fraction of listed firms to all firms is reported for bins of assets in USD billion: <0.1, 0.1 to 0.5, 0.5 to 1, 1 to 2.5, 2.5 to 5, 5 to 10, and >10, respectively. The sample includes 202,087 firms, of which 4,676 are from Denmark.