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LONG-RUN TRENDS IN AUSTRALIAN EXECUTIVE REMUNERATION: BHP, 1887–2012*

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Outside the United States, little is known of long-run trends in executive compensation. We fill this gap by studying BHP Billiton, a resources giant that has long been one of the largest companies on the Australian stock market. From 1887 to 2012, trends in CEO and director remuneration (relative to average earnings) follow a U-shape. This matches the pattern for US executive compensation, Australian top incomes, and (for the past two decades) average trends in executive compensation in top Australian firms. Like the United States, Australia experienced a post-war 'great compression' prior to the recent 'great divergence'.

JEL Categories: N300, N370, N800, N870

Keywords: Australian economic history, executive remuneration, great compression, great divergence, inequality

INTRODUCTION

In a 2009 report on executive remuneration, the Productivity Commission (2009, p. 49) noted that from 1993 to 2009, average earnings of ASX100 CEOs rose from $1 million (17 times average earnings) to $3 million (42 times average earnings).[1] The top 20 Australian Chief Executive Officers (CEOs) earned more than 100 times the average wage, with a significant number earning eight-figure salaries. Little data exist on CEO pay prior to the 1990s, which could lead a casual

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1 Productivity Commission, *Executive Remuneration in Australia*, p. 49.

reader to think that executive salaries have only ever risen, but the evidence of top incomes suggests otherwise. Using Australian taxation statistics, Atkinson and Leigh report that the income share of the top 1 per cent and top 0.1 per cent fell from the 1920s to the 1970s. Over the same period, High Court Justices, federal members of parliament, and senior public servants saw their earnings grow more slowly than the average employee.[2] Yet little is known about executive salaries over the full twentieth century.

In this article, we fill this gap by looking at mining company BHP Billiton (BHP), known until 2001 as Broken Hill Proprietary Company Limited companies. Throughout this period, its headquarters have been located in Melbourne. Its market capitalisation has averaged 13 per cent of Australia's domestic equity market capitalisation from 2002 to 2012, and reached 15–16 per cent during 2008–11.[3] As one of Australia's oldest and largest companies, it has records of executive pay over a suitably long time period to be useful in examining long-run trends in executive pay in a leading Australian company.

We combine data from annual reports, unofficial papers, and data on average Australian earnings to estimate the ratio of director pay to average pay and CEO pay to average pay over a 125-year period. We compare our estimates with analysis of US CEO pay ratios over the long run and estimated top income shares to determine if similar trends occurred, with a great compression in inequality in the post-Second World War era, followed by an expansion of inequality from the 1980s onwards. We also compare recent BHP data to average trends in executive pay in Australia.

To preview our results, we find that the earnings of those running BHP rose from the 1880s to the 1910s, trended downwards through the 1920s and into the 1930s, rose briefly during the Second World War, and fell again from the 1940s until the 1980s. Over recent decades, the pay of those running BHP has risen sharply. Our findings suggest a 'great compression' in executive salaries during the post-war era, followed by an expansion again in the late twentieth century, which matches the analysis of US executive salaries from the 1930s to the 2000s by Frydman and Saks, as well as the broader analysis of compression in the post-war US labour market.[4]

ANALYSING EXECUTIVE PAY

BHP is one of Australia's oldest corporations. Its original venture was silver and lead mines in the New South Wales town of Broken Hill in 1886. It diversified into

2 Atkinson and Leigh, Distribution of top incomes.

3 Based on data on BHP's market capitalisation from Bloomberg based on BHP Billiton's market capitalisation of $160.6 billion at 30/6/2012, shown in BHP Billiton, *Annual Report*, p. 80; and ASX data on domestic equity market capitalisation at 30/6/2012, shown in Australian Securities Exchange, Historical market statistics.

4 Frydman and Saks, Executive compensation; Goldin and Margo, The great compression; Goldin and Katz, Decreasing (and then increasing) inequality; Piketty and Saez, Income inequality.

steel production in 1915, with a major steelworks in Newcastle. After the Second World War, BHP further diversified into other commodities, including petroleum, copper, coal, and diamonds. In 2001, the company merged with Billiton, originally a Dutch firm whose mining interests included lead, tin, and bauxite.

Our main focus is on the directors of BHP, and the chief executive (a position described as 'managing director' or 'general manager' during the company's earlier years). Since 1887, BHP has had 15 CEOs: William Patton (1887–89), John Howell (1890–94), Alexander Stewart (1895–98), Guillaume Delprat (1899–1921), Essington Lewis (1921–49), Norman Jones (1950–66), Sir Ian McLennan (1967–70), J C McNeil (1971–82), Brian Loton (1983–90), John Prescott (1991–98), Paul Anderson (1999–2002), Brian Gilbertson (2002), Chip Goodyear (2003–08), Marius Kloppers (2009–13), and Andrew Mackenzie (2013-). Our principal source of information is BHP's annual reports. These are available in hard copy for 1887–1996 and electronic form for 1997–2012.

BHP DIRECTORS' EARNINGS

We begin by estimating the ratio of an average BHP director's remuneration to the pay of an average Australian.[5] Using the number of directors listed in BHP annual reports, we construct a series measuring the average remuneration over the period, relative to observations of average Australian income.[6] Given the multiple changes in tax regimes over the period, we use before-tax pay. This series is shown in Figure 1.[7]

5 Data on average income obtained from Hutchinson, Weekly wages. As Hutchinson's data do not include employer superannuation contributions, wherever possible we exclude superannuation or retirement benefits from director remuneration. Hutchinson's data do not include 2012, so we estimate the average earnings for 2012 using Series A2734032A in table 3 of Australian Bureau of Statistics, Average weekly earnings.

6 From 1972 onwards, we include only non-executive directors in this measure, so as to avoid skewing the average measure of director income with the significant rise in executive director pay during the 1980s (e.g. while average remuneration for executive directors was approximately $6,760 in the 1970s and $8,020 from 1980 to 1984, from 1985 to 1989 average executive director remuneration was $396,397, and from 1990 to 1994 it was $967,299). From 1987 to 1998, director remuneration is stated in ranges rather than specific values. In order to construct a conservative estimate of non-executive director remuneration, executive directors removed from the data are assumed to have been earning at the upper bound of the stated range. Where directors are noted to have served for only part of a year (due to recent appointment or retirement), any remuneration specific to them has also been excluded as it is not directly comparable with annual income (and exclusion was preferable to arbitrarily adjusting the remuneration to annualise the figure), and the director is excluded from the count of directors for the purposes of calculating the average director remuneration.

7 Early annual reports are unclear about whether the number of directors on the company represents the number that served throughout the year or instead the number of directors serving at the time of the annual report's publication. If it is the latter, then in cases where a director served through most of a year, but was not on the board at the time of the report's publication, but was replaced shortly thereafter, would manifest in a one-off increase in average director pay. This would explain some of the smaller short-term spikes in average director pay. Even if such

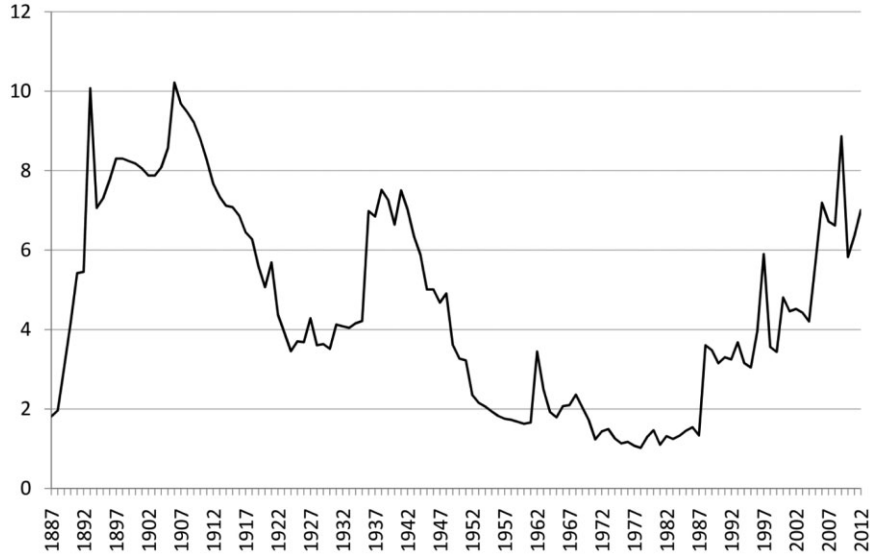

Figure 1. Average BHP director remuneration (relative to average Australian earnings), 1887–2012.

BHP director remuneration was about twice as much as the average Australian earnings in 1887, but this rose quickly to 7–10 times average earnings by the 1890s, and stayed at that level into the first decade of the twentieth century.[8] From the early-1910s to the late-1920s, BHP directors' pay fell to as low as four times average earnings and stayed at about that level through the Great Depression. BHP's steel production played a crucial role in Australia's Second World War effort, with its directors' salaries rising to around seven times average earnings as a result, before reverting to their 1930s level as soon as the conflict ended.[9]

In the post-war decades, BHP directors' salaries were steadily outpaced by average earnings. A BHP director earned five times the average income in the late-1940s, but just three times average earnings in the early-1950s. By the late-1950s, BHP director remuneration was twice average earnings. Their pay

variation is due not to genuine changes in average director remuneration, but rather to statistical artefacts as a result of ambiguity in the reports, the short-term variation is small enough that it does not distort the broader long-run trend.

8 The early and rapid rise in average director remuneration could be attributed to initially relatively low director pay at the company's inception being increased substantially throughout the first decade of operation as early exploratory mining and surveying confirmed the longer-term profitability of and prospects for the company.

9 Assuming that the spike around the late 1930s and early 1940s is due to BHP's role in Australia's war effort, it is unlikely to be representative of trends in executive remuneration in Australia as a whole. Nonetheless, even if this spike were dismissed as an outlier in the context of Australian executive remuneration, it would reinforce our broader observation of an Australian great compression from the beginning of the twentieth century to the 1970s.

spiked briefly upwards in the 1960s, but by the late-1970s, a BHP director was paid not much more than the earnings of an average employee, earning just 1.02 times the average income in 1978.[10] This ratio rose to around 1.5 in the mid-1980s before jumping up in the late-1980s and increasing from that point through to 2012, rising from around 3 in the early-1990s.

From 2000 to 2012, an average BHP director earned at least six times the income of an average Australian, peaking at 8.87 times the average income in 2009. By the end of the first decade of the twenty-first century, BHP directors' remuneration relative to average income had risen to its pre-First World War heights. While the boom in Australia's mining sector that began in the early twenty-first century may have contributed to the apparent increase in the trend during that period, given that the increase in income began long before then, it is reasonable to assume that the increase in income has not (solely) been a function of a major increase in mining activity.[11]

BHP CEO EARNINGS

While directors' earnings were reported in the company's annual reports throughout the period in question, executive remuneration has only been reported by BHP since 1987.[12] Prior to this year, therefore, we rely on external sources for CEO earnings. After an extensive search of company papers and history, we have discovered five reported salaries of BHP CEOs, covering the years 1887, 1899, 1903, 1921, and 1926.[13] We make two uses of these reported salaries. First, we plot them directly into Figure 2. Second, we use each to calculate the ratio of CEO pay to average director pay. Excluding one outlier, the smallest of these ratios was 4.21 in 1921, and the largest was 7.18 in 1903.[14] Based on accounts of the time, we assumed that as the first chief executive, Mr Patton remained on £4,000 for 1887–89. From 1890 to 1984, we construct a series of the likely range

10 These earnings only measure remuneration paid to an average director by BHP, and so was not a limit to the total income than an individual serving as a BHP director could earn. Directors with sources of income other than their work on the BHP board would still have been able to earn more than the average employee.

11 While our analysis averages across all directors, it is worth noting that BHP does not appear to reward firm-specific experience among directors. When a director retires, his or her replacement typically receives a similar level of remuneration.

12 Unfortunately, BHP was unable to provide any further detail regarding past CEO salaries beyond that which we obtained from external sources.

13 The 1887 figure is from Trengove, *What's Good*, p. 16. The 1899 and 1903 figures are from Osborne, Delprat. The 1921 figure is from Blainey and Smith, Lewis. The 1926 figure is from Blainey, *The Steel Master*, p. 90.

14 The excluded outlier is the ratio of 30.34 in 1887, which was due to the atypically large salary paid to Mr. Patton to bring him to the job in Australia from the United States. The conclusions of this paper would be strengthened were this outlier to be included, as it would result in an estimated range of chief executive earnings that was initially much higher and declined at a faster rate.

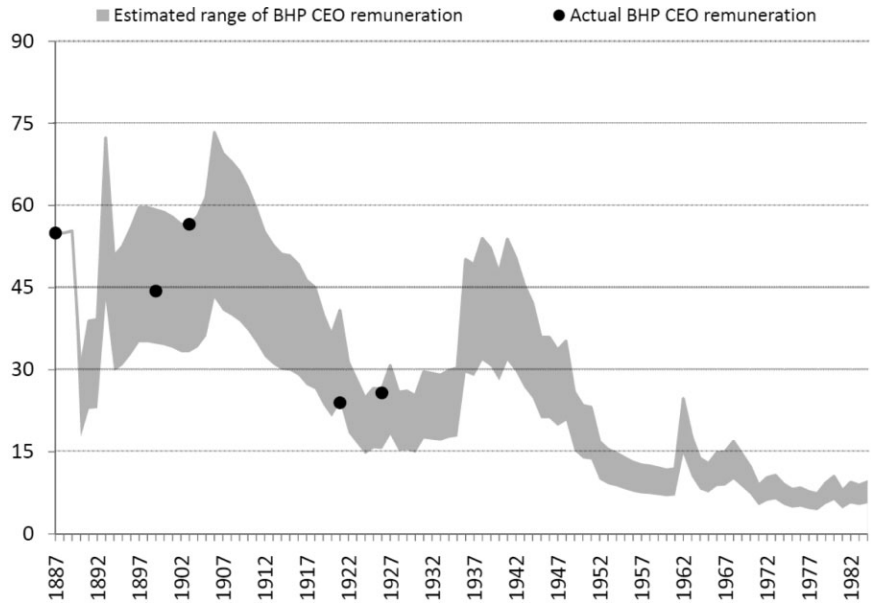

Figure 2. BHP CEO remuneration (relative to average Australian earnings), 1887–1984.

of chief executive earnings based on the minimum and maximum ratios of 4.21 and 7.18.[15] Actual CEO remuneration from 1987 to 2012 was substantially higher than this range (which is not unexpected given the substantial jump in director remuneration in the late 1980s observed in Fig. 1). As a result, we first show in Figure 2 the estimated range from 1887 to 1984 (in order to allow for a clearer portrayal of variation in CEO remuneration) before showing it alongside the more recent data for the purposes of comparison in Figure 3.

We estimate that after the very high earnings of Patton (around 55 times the average Australian earnings), the ratio of the BHP CEO's earnings to the average Australian earnings fell in the late-nineteenth century and then rose from around 25 to 45 in 1900. The ratio went still higher in the early-1900s, before declining to around 20 by 1930.

On the assumption that CEO pay tracked average directors' pay, we estimate that relative BHP CEO remuneration rose again from the mid-1930s to the mid-1940s to around 40 times average earnings, before returning to the pre-Second World War ratio of around 20 by 1950. From there, barring a short spike in the early-1960s, it trended steadily downwards for the next 30 years. Our

15 We estimate this range of likely CEO remuneration up until 1984. Beyond this point, executive director remuneration increases suddenly and substantially, and to the extent that CEO remuneration followed a similar trend, the method of estimating the likely range based on director remuneration is highly unlikely to be accurate.

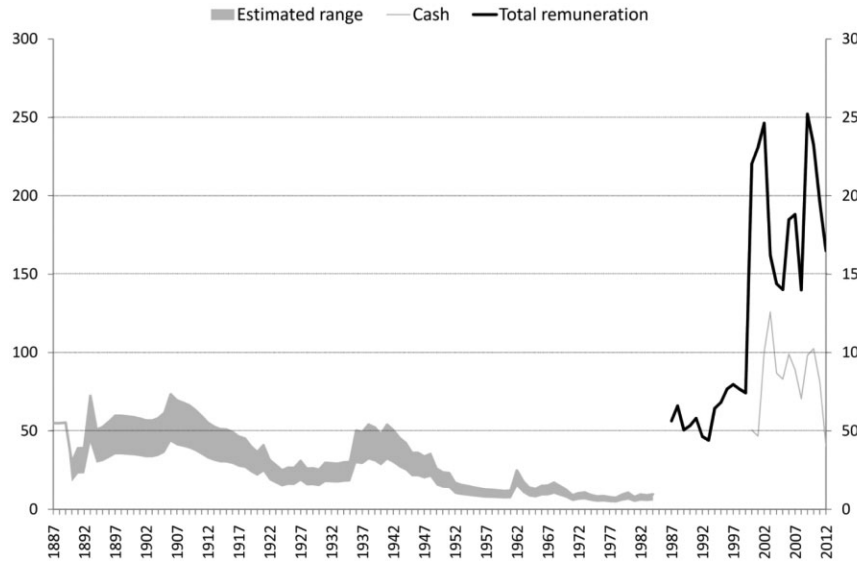

Figure 3. BHP CEO remuneration (relative to average Australian earnings), 1887–2012.

estimates suggest that average earnings rose faster than the earnings of BHP's CEO during this period, such that by end of the 1970s, BHP's CEO earned around 6 or 7 times the average Australian earnings.[16]

For the period from 1987 to 2012, executive remuneration as reported in the company's annual reports is used.[17] From 1987 to 1998, BHP reported remuneration of all executives, but gave ranges rather than specific values and did not identify the CEO. For this period, we assume that the highest-paid executive in each of these years was the CEO, and have been conservative in assuming that their remuneration was at the lower bound of the range stated in BHP's reports. Reports for this period do not distinguish between different components

16 It is worth noting that as these estimates are based on known values of CEO salaries up to 1926, the estimates for the 1980s are the most susceptible to measurement error. Another concern regarding the estimates' accuracy is that the change in director remuneration fluctuates more from 1960 to 1984 than from 1900 to 1944 or 1945–59. For example, from 1900 to 1944, the mean and standard deviation of the growth in average director remuneration were 5.79 per cent and 18.14 per cent, and –0.19 per cent and 10.02 per cent from 1945 to 1959. By comparison, the mean and standard deviation were 15.74 per cent and 36.33 per cent from 1960 to 1984. Furthermore, the minimum and maximum (–16.67 per cent and 20 per cent) in 1945–59 change to –25.97 per cent and 139.51 per cent for 1960–84.

17 Reports for this period do not distinguish between different components of remuneration, so we treat these figures as total remuneration for the purposes of comparison with data from 1999 to 2012. Because the 1998 observation is an extreme outlier (being approximately $11 million due to the inclusion of severance pay in total remuneration), it is excluded and the ratio for 1998 is instead calculated as the average of the 1997 and 1999 values.

of remuneration, so we treat these figures as total remuneration for the purposes of comparison with data from 1999 to 2012. From 1999 to 2012, we have used total remuneration as reported by BHP.[18] As CEO remuneration in this period incorporates cash payments as well as non-cash benefits and financial incentives (e.g. stock options), from 1999 we show remuneration in two forms: cash (including only salary and bonuses) and total remuneration (which includes all other forms of remuneration except for retirement benefits).[19]

In Figure 3, these recent figures show a significant rise in the pay of BHP's CEO relative to the average Australian income. By the late-1980s, total CEO remuneration had returned to the ratio not seen since the start of the twentieth century, at or above 50 times average earnings. This rose to around 75 times average earnings by 1999. In the twenty-first century, when measuring cash remuneration only, CEO pay has fluctuated around this ratio. Total CEO remuneration in this period has ranged from 150 to 250 times average earnings. By any of these measures, the ratio of CEO remuneration to average earnings has exceeded the highest ratios previously seen at the beginning of the twentieth century.

The substantial increase in total remuneration from 1999 to 2000 is reflective of the Productivity Commission finding that incentives were utilised increasingly in the 1990s, and that the internationalisation of the market for CEOs saw Australian CEO remuneration increase.[20] That BHP wanted a CEO of high calibre from the international market is shown by a clear statement in the 1999 Annual Report by then Chairman of the Board of Directors, Don Argus, who identified 'finding world class executives with the requisite experience to lead and reshape BHP' as being 'one of [the Board's] most important tasks for the year'. The increase in remuneration upon hiring of Paul Anderson (and the incentives offered to Mr Anderson as CEO during the restructure and merger of the company as it transformed into BHP Billiton) suggests that they were willing to pay a substantial premium for that 'world class' experience.

To compare trends in real growth, Figure 4 shows indexed measures of BHP's CEO total and cash remuneration (CPI-adjusted) compared with BHP's CPI-adjusted share price and market capitalisation, and Figure 5 shows the same measures of remuneration compared with the gross value added by Australia's

18 The total remuneration reported in annual reports is based on the cash salary as well as the estimated values of non-cash remuneration in the form of incentives such as share options (an example of one common method for valuing stock options is through the use of the Black–Sholes pricing model). There is no guarantee of the accuracy of the estimates reported in the BHP annual reports. Valuation of share options, for example, may not accurately forecast the options' realised value. For more on this, and on reasons why such estimates may over- or underestimate the realised value, see Productivity Commission, *Executive Remuneration in Australia*, pp. 45–7. For an example of BHP's methods for valuing incentives, see BHP Billiton, Annual Report 2012, pp. 149–56.

19 Retirement benefits are excluded for the purposes of comparison with data on average Australian earnings, which do not include superannuation contributions from employers. Retirement contributions from BHP to its CEOs (which averaged around $600,000–$700,000 per year for the last decade) are therefore excluded from these data.

20 Productivity Commission, *Executive Remuneration in Australia*, pp. 83, 110.

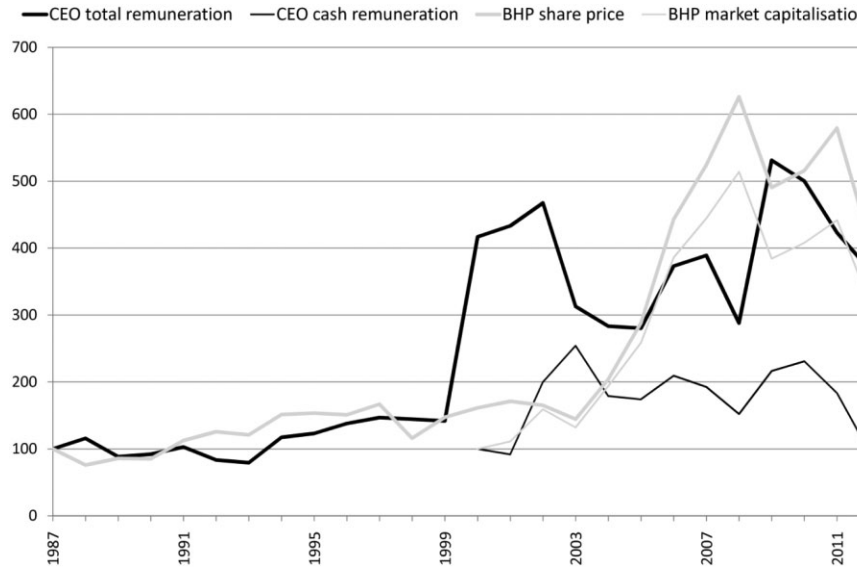

Figure 4. Indices of CPI-adjusted value of BHP CEO total remuneration (1987 = 100), cash remuneration (2000 = 100), BHP share price (1987 = 100), and BHP market capitalisation (2000 = 100).

mining sector.[21] The real growth in BHP CEO total remuneration approximately tracks that of the company's share price, with total remuneration growing on average 3 per cent per year faster than the share price (from 1987 to 2012), compared with cash remuneration, which grew on average 4.6 per cent per year slower than the share price (from 2000 to 2012). CEO total and cash remuneration grew on average 10.8 per cent and 6.9 per cent per year slower than market capitalisation (from 2000 to 2012). Remuneration also outstripped growth in the mining sector's gross value added, with total remuneration increasing on average 6.9 per cent per year faster than gross value added (from 1987 to 2012) and cash remuneration increasing on average 3 per cent per year faster than gross value added (from 2000 to 2012).[22]

CEO remuneration also grew faster than average incomes in the mining sector as a whole. Figure 6 shows BHP total remuneration, cash remuneration, and average remuneration in the mining sector, from 1995 to 2012, relative to average

21 Mining gross value added is the chain volume measure from table 5 of Australian Bureau of Statistics, Australian system. BHP AU Equity share price data and market capitalisation are from Bloomberg.

22 While the ABS uses an industry-specific deflator to calculate the mining sector's gross value added, comparing this to the CPI-adjusted remuneration is appropriate in terms of comparing the purchasing power of remuneration to growth in the real value of output specific to the mining industry.

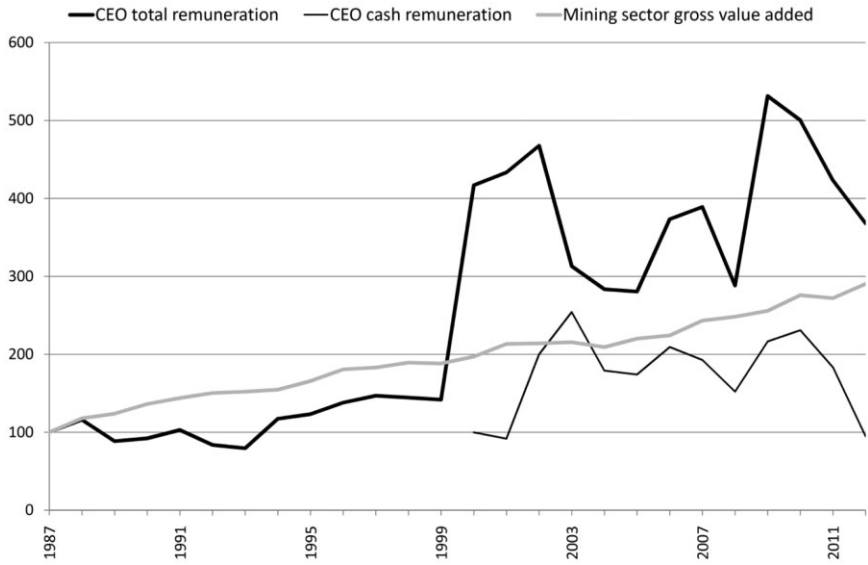

Figure 5. Indices of CPI-adjusted value of BHP CEO total remuneration (1987 = 100) and cash remuneration (2000 = 100), compared with the gross value added of the Australian mining sector (1987 = 100).

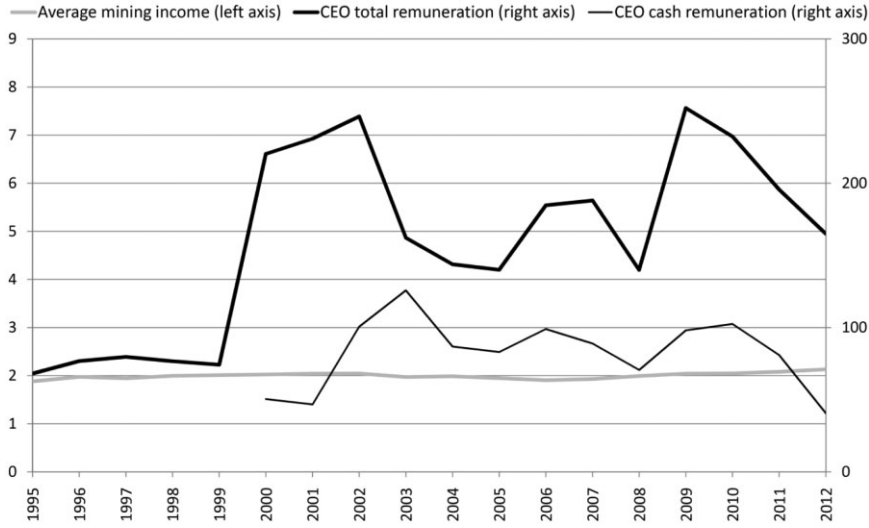

Figure 6. BHP CEO total remuneration, cash remuneration, and the average earnings in the mining sector (each relative to average Australian income), 1995–2012.

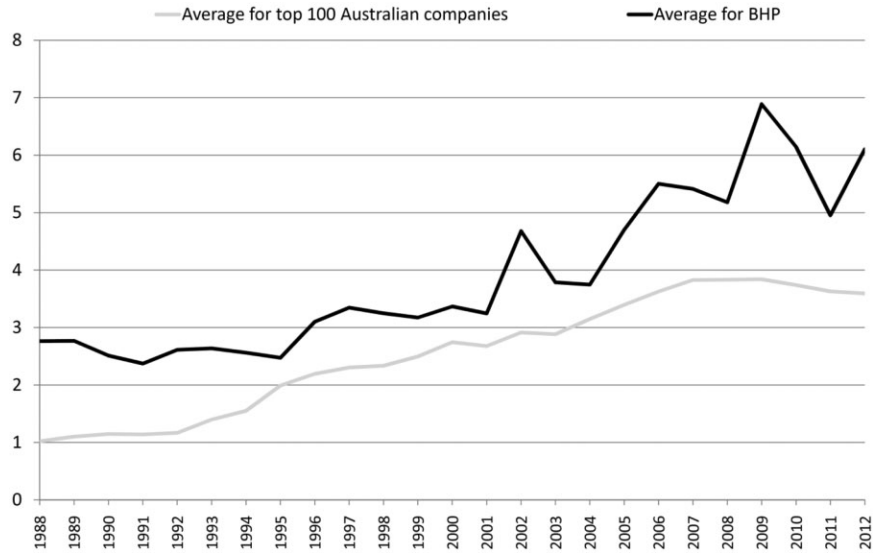

Figure 7. Average remuneration of top five non-executive directors excluding the chair (relative to average Australian earnings), 1988–2012.

Australian income.[23] Relative to the average Australian earnings, cash remuneration for the CEO of BHP grew on average 4.4 per cent per year faster than average mining income (from 2000 to 2012), and total remuneration grew on average 12.1 per cent per year faster than the earnings of the average mining sector employee (from 1995 to 2012). Throughout the period, average mining sector pay remained at or around twice the average Australian earnings, with an average annual change of just 0.75%.

BENCHMARKING AGAINST OTHER SERIES

Comparison with CEOs of other Australian companies

As Australia's biggest company, and as a company involved in a booming mining sector, it is conceivable that the recent increase in BHP CEO and director remuneration might not be representative of trends in other Australian companies. To test this, Figure 7 plots data provided by Egan Associates on the average remuneration of the top five non-executive directors in the top 100 Australian companies (excluding the Chair of the Board of Directors) against the average remuneration of BHP's top five non-executive directors (excluding the Chair of

23 Mining sector income is from table 10 of Australian Bureau of Statistics (2013), measuring average weekly total earnings of persons employed in the Australian mining industry.

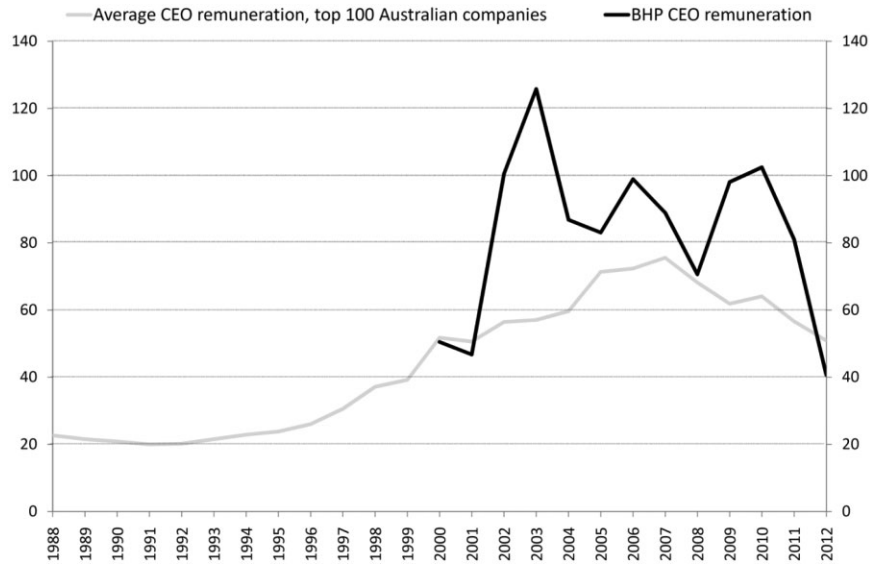

Figure 8. BHP CEO remuneration and average CEO remuneration among the top 100 Australian companies (both relative to average earnings), 1988–2012.

the Board of Directors). Both are measured relative to the average earnings of all Australians. From 1988 to 2012, the ratio of average BHP director remuneration relative to average Australian earnings at BHP increased from 2.76 to 6.1 (an increase of 221 per cent), while average director remuneration in the top 100 companies rose from 1.02 to 3.59 times average earnings (352 per cent). Thus, while BHP directors were remunerated better than the average for the top 100 firms, their pay grew slightly more slowly over this period, albeit from a higher base. That BHP directors remuneration exceeded average director remuneration is to be expected, given the company's status as one of the oldest and largest companies in the country. The fact that the difference between BHP director and average director remuneration widened after the early 2000s could be attributed to the mining boom in Australia. Nonetheless, across the period 1988–2012, the increase in BHP director remuneration is not uncharacteristic of trends in Australia as a whole.

We then perform a similar comparison for CEO pay. Figure 8 plots BHP's CEO remuneration alongside data provided by Egan Associates on the average CEO remuneration from the top 100 companies in Australia from 1988 to 2012. Both are measured relative to average Australian earnings. Egan Associates' data on average CEO remuneration include only cash salaries and bonuses, so we use the same measure for BHP CEOs. This means we must exclude BHP data for 1988–98, as the company did not separately report cash remuneration from salaries and bonuses in those years (though these data follow the same general trend).

Because the analysis in Figure 8 focuses only on cash salaries and bonuses, the BHP pay ratio is between 40 and 120 times average earnings (recall that the total remuneration measure in Figure 3 was between 70 and 250 times average earnings). Not surprisingly, because we are focusing on a single large company, the ratio of CEO pay to average pay is higher for BHP, and also more volatile. On average, across the top 100 Australia companies, CEO pay rose from 22.62 times average earnings in 1988 to 75.55 times average earnings in 2007, before falling to 50.84 times average earnings in 2012. The comparison suggests that the high BHP CEO remuneration of the twenty-first century is, like the remuneration of its directors, not uncharacteristic of the Australian market as a whole.

Taken together, Figures 7 and 8 suggest that trends in BHP director and CEO remuneration in the late-twentieth and early-twenty-first centuries are broadly consistent with those for the top 100 Australian companies. This echoes the analysis of executive remuneration at General Electric conducted by Frydman, which finds that from the 1940s to the 2000s, long-run trends in executive remuneration at General Electric 'match closely' broader trends in US executive remuneration.[24] We reach a similar conclusion for BHP and Australian executive remuneration. This gives us greater confidence that in addition to telling the story of BHP CEO remuneration, our 126-year series is also characteristic of trends in long-run executive pay ratios in general.

Comparison with top incomes

Figure 9 plots the average income of a BHP director as a ratio of the minimum incomes required to enter the top 1 per cent and 0.5 per cent of Australian income earners, as estimated by Atkinson and Leigh, from 1922 to 2011.[25] For most of the 1930s and 1940s, the average income of a BHP director increased sufficiently to see them retain an income equal to or greater than that required to enter the top 1 per cent, and even break through into the top 0.5 per cent.

For example, in 1922 the average director's income of (£764.29) was virtually identical to the cutoff for the top 1 per cent (£763), but fell short of the cutoff for the top 0.5 per cent (£1,194) with a ratio of only 0.64. From 1936 to 1943, the average income of a BHP director was at least as much as was required to enter the top 0.5 per cent of income earners in Australia. The decline in average director remuneration from the mid-1940s saw the ratio of that pay to the cutoffs for both the top 1 per cent and 0.5 per cent fall to around or below 0.50 for most of the following three decades, with only a short spike in the early- and late-1960s. By 1981, average BHP director's earnings ($13,375) had fallen to almost two-fifths of the cutoff for the top 1 per cent ($33,266).

24 Frydman, Learning from the past.

25 Atkinson and Leigh, Distribution of top incomes. The top incomes data contain observations for the year beginning 1 July from 1921 to 2010, which we match to BHP remuneration data for the financial year ending 31 May 1922–99, and for the financial year ending 30 June 2000–11.

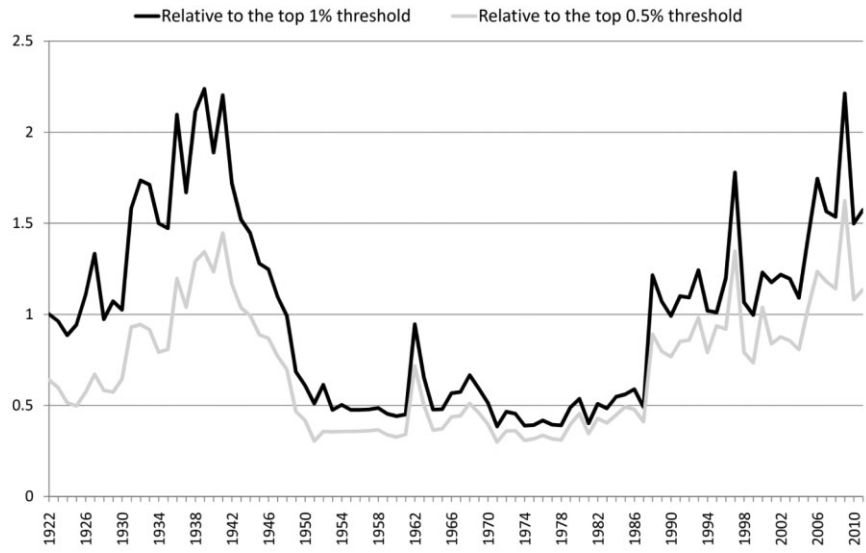

Figure 9. Average BHP director income relative to the minimum incomes required to enter the top 1 and 0.5 per cent of Australian income earners, 1922–2011.

In the late-1980s, BHP director pay quickly outpaced that of other high-earning groups. For almost the entire time since 1988, BHP directors have been paid enough to put them in the top 1 per cent, and since 2005, BHP directors' remuneration has put them in the top 0.5 per cent. By 2011, average remuneration of non-executive BHP directors ($330,785.58) was 1.57 times the cutoff for the top 1 per cent ($210,121), and 1.14 times the cutoff for the top 0.5 per cent ($291,217). The average BHP director's remuneration now comfortably places them in the top 0.5 per cent, a situation not seen since the Second World War.

A particularly striking change that we observe is the changes in pay ratios from 1978 (when, as Fig. 1 showed, a BHP director was paid almost exactly the same as an average worker) to 2012 (when a BHP director was paid enough to comfortably put them into the top 0.5 per cent). Note that as we measure the income of non-executive directors, this increase reflects the director's fee paid to the average director for their role as a member of the board, and not any change in any other role they may have had in the corporation. When making inferences about broader long-run trends in director pay based on this variation, it is worth noting that it is possible that such a rise in non-executive director pay was offset in some way by some reduction in other sources of income (e.g. perhaps the average BHP director served on fewer boards in 2012 than in 1978). However, the change is so large that it is difficult to see how just one of these factors alone could explain it (e.g. is it really likely that the average BHP non-executive director served on eight times as many boards in the 1970s as in the 2000s?). Given the similar growth in director remuneration across Australia's top 100 companies (see Fig. 6),

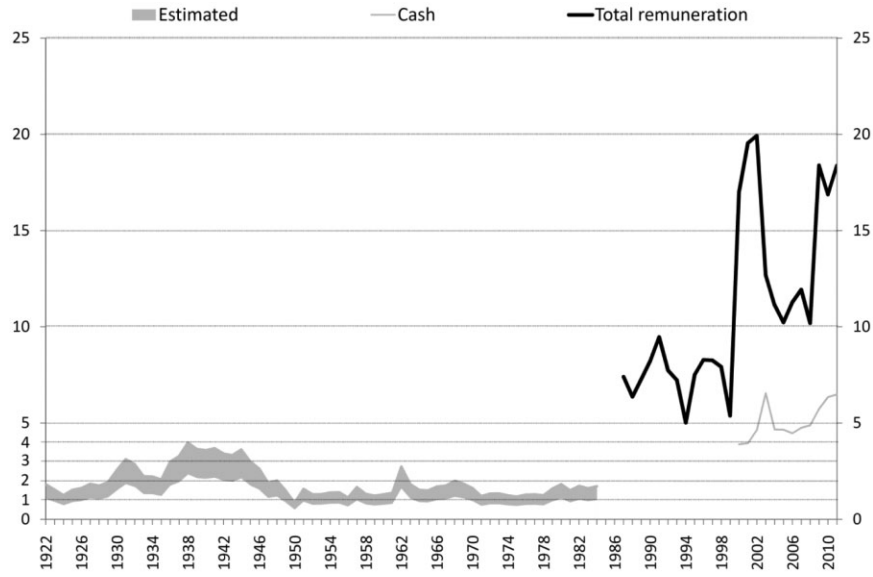

Figure 10. BHP CEO remuneration relative to the minimum income required to enter the top 0.1 per cent of Australian income earners, 1922–2011.

it seems likely that this is representative of a broader increase in inequality between average workers and company directors.

Moving from directors to CEOs, Figure 10 plots BHP CEO income as a ratio of the minimum income required to enter the top 0.1 per cent of Australian income earners, as estimated by Atkinson and Leigh.[26] It suggests that BHP CEOs have rarely earned much less than the amount required to be in the top 0.1 per cent. For most of the period from 1922 to 1985, their incomes were between 1 and 3 times the cutoff for the top 0.1 per cent. Since 2000, BHP CEO income has ranged from around 4 to 7 times the cutoff for the top 0.1 per cent when measuring only salary (including bonuses), and from 10 to 20 times the cutoff when measuring total remuneration.

In Figures 9 and 10, we have compared BHP directors' and CEOs' remuneration to the cutoff necessary to enter top income groups. This effectively answers the question: 'where did BHP executives rank in Australian society?' Another way of analysing the data is to compare the ratio of BHP CEO pay to average income (from Fig. 2) with top income shares. This effectively compares two measures of inequality, posing the question: 'did executive pay ratios track Australian top income inequality?'

To answer this alternative question, in Figure 11 we plot the ratio of BHP CEO pay to average Australian earnings, and the share of total household income

26 Atkinson and Leigh, Distribution of top incomes.

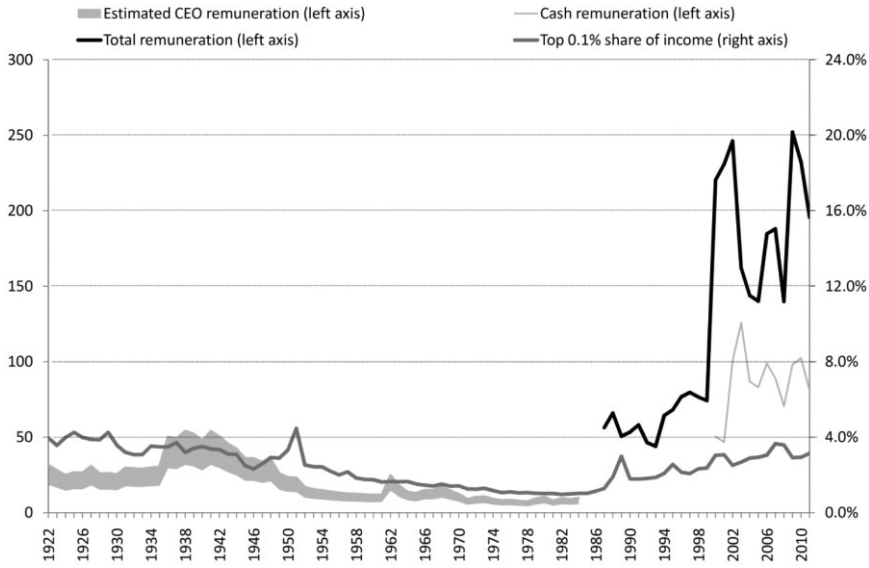

Figure 11. BHP CEO remuneration (relative to average Australian earnings) and income share of the top 0.1 per cent of Australian income earners, 1922–2011.

earned by the 0.1 per cent of Australians, as estimated by Atkinson and Leigh.[27] Both series are U-shaped, and follow a similar downward trend from the 1950s to 1970s. However, the modern-day rise in BHP CEO pay is much greater than the increase in the income share of the top 0.1 per cent. One way to see this is to compare the 2000s with the 1920s. While the income share of the top 0.1 per cent of income earners in Australia by the end of 2011 was a little lower than the mid-1920s peak of around 4 per cent, BHP CEO remuneration was far higher than it had been at any point in the firm's history.

COMPARISON WITH FRYDMAN–SAKS DATA ON REMUNERATION OF TOP US EXECUTIVES

Finally, we look at how the gap between executive pay and average pay in Australia compares with the United States. In Figure 12, we plot our estimates alongside the ratio of US executive remuneration in the top 50 firms to average earnings. Both BHP and US CEO remuneration are shown measuring salary (including cash bonuses) and total remuneration (comprising salary plus benefits and long-term incentives). Comparable data are available from 1936 to 2005.

27 Atkinson and Leigh, Distribution of top incomes.

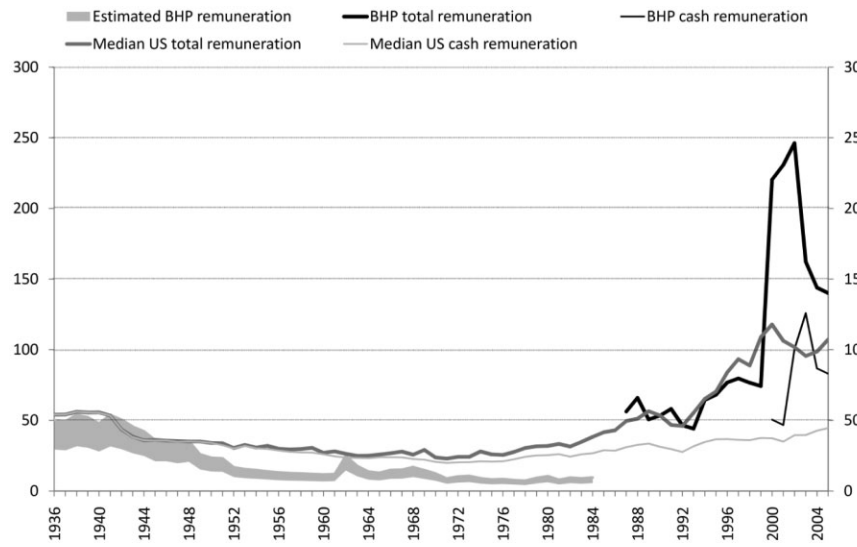

Figure 12. BHP CEO remuneration and median earnings of top three executives of top 50 US firms (both relative to average earnings), 1936–2005.

Both the US data and our estimates of BHP CEO income follow similar broad trends, with executive pay in both countries outpacing average earnings from the Second World War until the late-1970s (the so-called 'great compression'). From the 1930s, the ratio of US CEO total remuneration to average pay fell from a peak of 56.07 to a low of 22.97 in the 1969, while the ratio of BHP CEO total remuneration fell from around 40 to around 10. After a period of stability in the 1970s, both series show a sharp increase in recent decades. From 1981 to 2005, the ratio of US CEO total remuneration to average pay rose from 31.83 to 107.21, while the ratio of BHP CEO total remuneration to average pay rose from around 10 to 140.08.

CONCLUSION

Through extensive analysis of the archival records of BHP, one of Australia's oldest and largest companies, we have uncovered new evidence that helps to paint the picture of long-run trends in inequality.[28] Comparing the salaries of BHP directors and CEOs with those of average Australians, we find that top earnings rose from the 1880s to the 1910s, then fell steadily (with the exception of the Second World War itself) until the 1970s. From the 1980s to the 2010s, top

28 For an analysis of inequality in Australia over more than two centuries, see Leigh, *Battlers and Billionaires*.

corporate earnings have risen markedly, and are now at or above their level in the early-twentieth century.

Comparing trends in BHP executive pay with pay in the top 100 Australian firms (available since the late-1980s), we find quite similar patterns. The same is true when we compare our BHP executive pay series with remuneration in the top 50 US firms (available since the early-1940s). We also analyse top incomes data (available since the early-1920s), and find that while both executive pay ratios and top income shares follow a U-shaped pattern, the recent rise in Australian executive pay has outpaced the rise in top income shares.

What explains these trends? Given the commonality between BHP executive salaries and those in the broader Australian corporate sector (and indeed, the US corporate sector), explanations must go beyond those that affect BHP alone. The rise in BHP CEO salaries pre-dates the twenty-first century mining boom, and outstrips growth in average mining sector value-added. And while total remuneration closely tracks the BHP share price (as is to be expected given the dependence on long-term incentives on the value of the company's stocks), changes in cash remuneration cannot be fully explained by variation in BHP's share price.

In our view, three explanations account for most of the growth in Australian executive pay. First, our largest firms have grown larger, so CEOs and directors end up being paid more to take on greater responsibility. In effect, mergers increase remuneration at the top of a firm, but not for the average employee. Evidence from the United States shows this link between pay and firm size quite clearly, while Australian studies have noted similar trends in firm size.[29] For example, from 1987 to 2007, the top 20 firms grew more than twice as fast as the rest of the Australian share market.[30] This explanation would also account for the substantial growth in BHP CEO remuneration (whether measured as cash or total remuneration) relative to growth in average incomes in the mining sector overall.

Second, as the market for English-speaking executives has become more integrated, and recruitment panels have sought out international expertise, salaries in Australia have been benchmarked against those in the United States. The labour market integration effect can be seen in the fact that top income shares have risen faster in English-speaking countries than in non-English speaking countries, and that in Canada, top incomes have risen more slowly in the French-speaking province of Quebec.[31] The clearly stated intention of BHP in 1999 that they were seeking 'world class' experience and the subsequent jump in remuneration suggests that was a contributing factor in the more recent rapid increase in CEO remuneration – one which is reflected in trends in Australian executive pay in general.

Third, Board committees have played a part in boosting top income shares. While firms have looked in many places for savings, they have traditionally been reluctant to reduce costs by hiring a cheap CEO. In a 2009 survey, firms were asked how much they would be prepared to pay for a CEO. About 45 per cent of

29 Gabaix and Landier, Why has CEO pay increased so much?
30 Productivity Commission, *Executive Remuneration in Australia*, p. 56.
31 Leigh, *Battlers and Billionaires*; Saez and Veall, The evolution of high incomes.

firms said they would pay above-median, about 50 per cent would pay the median, and about 5 per cent would pay below-median.[32] Even absent such as a 'Lake Wobegon effect', remuneration committees have tended to take the view that increased incentive payments make it necessary for firms to raise base remuneration, and less job security makes it necessary for firms to increase severance payouts. Again, these shifts have acted to boost total CEO pay.

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32 Peetz, Asymmetric reference points.