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# The performance and characteristics of Australian firms with Employee Share Schemes

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## Abstract

The characteristics and performance of Australian firms engaged in an Employee Share Scheme (ESS) were explored using Economic Activity Survey data and Australian Tax Office data. ESS payments grew to just over \$2 billion in 2014–15 accounting for approximately 0.4 per cent of total wages and salaries in Australia. Large mature companies in Mining and Financial services were more likely to have an ESS. However, the ESS payment share of total wages is on average 4.5 times higher for SMEs than for large firms. This finding suggests that ESS is a more important part of SME employee remuneration. Firms with share based payments had on average a lower level of employee churn, higher wages per employee and higher labour productivity, compared to other firms of a similar size or age. This productivity difference was strongest for SMEs. The data suggests that the incidence of ESS in Australian firms are relatively insensitive to policy change.

**JEL Codes:** J3, L22, L26

**Keywords:** employee share scheme, ESS, productivity, start-up, entrepreneurship, wage



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## Key points

- The proportion of Australian firms with Employee Share Schemes (ESS) grew from 0.23 per cent to 0.57 per cent from 2006–07 to 2014–15.
- Estimated annual ESS payments were \$2 billion in 2014–15 accounting for approximately 0.4 per cent of total wages and salaries in Australia. Mature firms (86 per cent in 2014–15), particularly large, mature firms (65 per cent in 2014–15) account for the majority of ESS spending.
- Use of ESS is most common in large, mature, mining, professional, scientific and technical services and finance and insurance services firms.
- Firms with ESS were found to have higher wages per employee. This result is generally consistent across all size, industry and age groups with the exception of young, large firms.
- Small firms with ESS have a significantly higher proportion of their total wages and salaries being paid as ESS compared with larger firms. For every dollar spent on wages and salaries, small ESS firms paid approximately 25 to 53 cents to employees in the form of share based payments, depending on age. Large ESS firms paid 3 cents in the form of share based payments for every dollar of wages and salaries paid.
- A significant decrease in the ESS intensity of small firms using ESS occurred in 2008–09 and 2009–10. This most likely represents a sharp decline in employee risk appetites and attitude towards accepting equity during the global financial crisis.
- Compared with their non-ESS counterparts, firms with ESS have lower employee churn, higher sales, higher value added, higher labour productivity and higher value added growth. The positive relationship between ESS and firm performance weakens as firms get larger and older indicating that, if a causal relationship exists, the benefits of ESS (and sensitivity to ESS policy incentives) are greatest for small businesses.

# 1. Introduction

Employee Share Schemes (ESS; see Box 1.1) are a form of shared capitalism that have been argued to reduce wealth inequality and improve firm and aggregate economic outcomes.<sup>1</sup> Australian ESS policy has enjoyed bipartisan support and attention since the 1970s (See Box 1.2).<sup>2</sup> ESS are considered by policy makers and advocates to be an important mechanism to encourage start-up activity by enabling Australian employers to improve cash flows and attract and retain talented staff at lower rates of wage compensation (when supplemented with shares or options).<sup>3</sup> Furthermore, ESS policies indirectly encourage risk taking, entrepreneurship and investment important to fostering innovation.<sup>4</sup>

ESS is a form of organisational capital building. Analysis of survey data indicates that the main reason for Australian firms introducing ESS is to motivate, attract and retain competitive and valuable employees.<sup>5</sup> Principal-agent behavioural theory argues that employee rational self-interest, risk aversion and effort aversion creates costs for an organisation. In the absence of complete information, the *principal* (firm owner) has to raise productivity through a mix of compensation and monitoring of *agents* (employees). ESS are a way to align principal and agent efforts to enhance productivity, however, a free rider effect is expected to diminish the effect of ESS in larger firms.<sup>6</sup> Employee turnover, or churn, is not cost free. Firms may need to take on the costs of firm-specific training and the transaction costs of losing tacit corporate knowledge and other intangible capital embedded in the lost employee. ESS reduces employee turnover which may result in increases in productivity.<sup>7</sup> Employee turnover is a good measure of employee satisfaction and highly correlated with firm and employee performance.<sup>8</sup>

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## Box 1.1: Defining Employee Share Schemes

An employee share scheme (ESS), also referred to as an employee share option plan, employee share ownership scheme, or an employee equity scheme, is a remuneration scheme under which firms offer to their employees shares, stapled securities, or rights to acquire them (options).<sup>9</sup>

There are two main types of ESS: (1) narrow-based, which are only offered to a firm executive, and (2) broad-based, which are available all employees and typically used by 50 to 75 per cent of all employees.

ESS should not to be confused with Cooperative, Mutual and Member-owned firms<sup>10</sup>, which may or may not have an ESS.

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<sup>1</sup> Blasi *et al.* (2013); Employee Ownership Australian & New Zealand (2014)

<sup>2</sup> Landau *et al.* (2013); House of Representatives (2015)

<sup>3</sup> Department of Prime Minister and Cabinet (2014); The Treasury (2015)

<sup>4</sup> *Ibid.*

<sup>5</sup> Landau *et al.* (2013); Lin & Sesil (2011); Blasi *et al.* (2003)

<sup>6</sup> Sesil & Lin (2011)

<sup>7</sup> Lin & Sesil (2011)

<sup>8</sup> Park & Shaw (2013)

<sup>9</sup> Department of Parliamentary Services (2015)

<sup>10</sup> Senate Economics Reference Committee (2016)

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### Box 1.2: Employee Share Scheme policy in Australia

Australian Government policy currently supports increased employee share ownership by providing several tax concessions for shares or options obtained as a result of ESS under certain prescribed conditions. For example, one concession provides a tax exemption for up to \$1000 per annum of relevant equity to be deferred for up to 15 years.<sup>11</sup> Changes to ESS tax policy in 2009 was argued by the business sector to have discouraged the incidence of ESS.<sup>12</sup>

The Tax and Superannuation Laws Amendment (Employee Share Schemes) Bill 2015, which came into effect on 1 July 2015, effectively wound back much of the 2009 changes including deferring the taxation point for ESS options and providing an additional concession for shares and options issued to employees of eligible start-up companies. Under the concession, the total amount of the employee's assessable income under Division 83A of the Income Tax Assessment Act for an income year is reduced by the total amounts included under that Division in respect of ESS interests that satisfy the conditions.<sup>13</sup>

The Australian Government recently consulted on options to amend the Corporations Act disclosure requirements to make ESS more user-friendly by giving employers more choices as to how they offer incentives to their employees and reducing the red tape associated with offers of incentives to employees.

Landau *et al.* (2013) argue that there is no evidence of a direct link between broad-based ESS and productivity in Australia, and hence, Australian Government policy on ESS (Box 1.2) is based on a false premise. However, ESS, in particular broad-based ESS, has been recognised internationally as positively associated with high profitability, productivity and productivity growth with little evidence of reverse causality.<sup>14</sup> Blasi *et al.* (2016) show that high performing firms have a disproportionately high incidence of ESS. ESS is more likely to be used where employee tasks or performance are complex and/or hard to monitor. For example, in fast growing firms, large firms or innovative firms, where value is predominantly generated from intangible capital.<sup>15</sup> Positive correlations between ESS, productivity, profitability include evidence of increased product and process innovation by employees in receipt of shares or share options, particularly in broad-based schemes.<sup>16</sup>

Over the last twenty years there have been two federal parliamentary inquiries<sup>17</sup> into ESS finding that, executive remuneration aside, 'very little of a substantive nature is known about employee share plans in Australia at all'.<sup>18</sup> ABS data show that from 1979 to 2004 the percentage of employees receiving shares as an employment benefit increased from 1.3 per cent to 5.9 per cent

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<sup>11</sup> Australian Taxation Office (2015) <https://www.ato.gov.au/General/Employee-share-schemes/>

<sup>12</sup> Treasury (2015)

<sup>13</sup> Australian Taxation Office (2015) <https://www.ato.gov.au/General/Employee-share-schemes/In-detail/Key-ESS-changes-in-detail/>

<sup>14</sup> Guest *et al.* (2000); Conyon & Freeman (2001); Black & Lynch (2004); Sesil *et al.* (2002); Sesil *et al.* (2004); Sesil & Lin (2011); Jana & Petr (2013)

<sup>15</sup> Kroumova & Sesil (2006); Chang *et al.* (2015)

<sup>16</sup> Michie & Sheehan (1999a&b; 2003b); Sesil *et al.* (2004); Chang *et al.* (2015)

<sup>17</sup> The Senate Economic Reference Committee (2009); House of Representatives Standing Committee on Employment, Education and Workplace Relations (2000).

<sup>18</sup> House of Representatives Standing Committee on Employment, Education and Workplace Relations (2000)

in Australia.<sup>19</sup> By August 2009 this had declined to 3.4 per cent.<sup>20</sup> This data series has been discontinued since 2009. Australian empirical research into the link between employee share ownership, employee turnover and productivity is limited.<sup>21,22</sup> Seventy five per cent of 139 firms surveyed by the University of Melbourne either agreed or strongly agreed that having a broad-based ESS encouraged increased productivity.<sup>23</sup>

This paper aims to provide evidence and inform policies that promote employee share ownership in Australia. This paper uses cross-sectional and panel analysis of Australian Bureau of Statistics (ABS) *Economic Activity Survey* data and Australian Tax Office data (Appendix A) to identify some of the characteristics and performance of firms engaged in ESS over the period 2006–07 to 2014–15.

## 2. Results

### 2.1 Use of Employee Share Schemes (ESS) is most common in large firms in mining, ICT and financial service industries

Total estimated ESS payments grew from \$1.4 billion in 2006–07 to \$2.0 billion in 2014–15, accounting for approximately 0.38 per cent of total wages and salaries in Australia in 2014–15 (Figure 2.1).<sup>24</sup> Young firms (less than six years of age) have relatively low total expenditure on ESS (\$128 million in 2014–15; 6 per cent of the total). Young, small firms had the highest proportion of all young firm expenditure on ESS. Mature firms (86 per cent in 2014–15), particularly large, mature firms (65 per cent in 2014–15) accounted for the majority of total spending on ESS.

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<sup>19</sup> ABS (2005)

<sup>20</sup> ABS (2010)

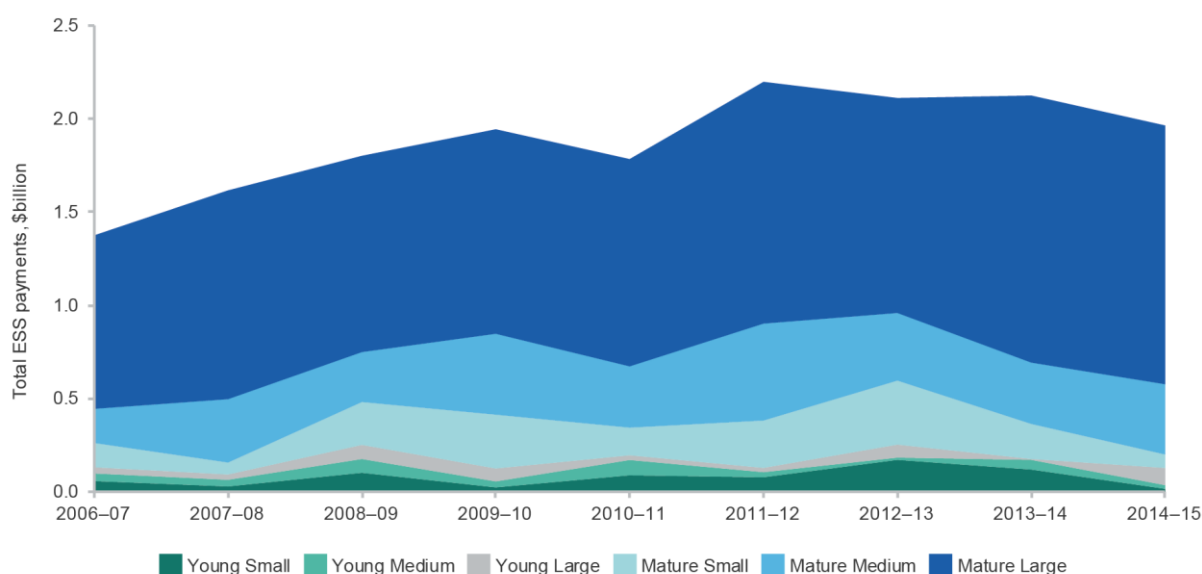
<sup>21</sup> House of Representatives (2015)

<sup>22</sup> House of Representatives Standing Committee on Employment, Education and Workplace Relations (2000)

<sup>23</sup> Landau *et al.* (2013)

<sup>24</sup> Since the EAS was not designed to deliver national aggregate estimates of ESS payments, we used tax office data to show that the EAS provides a reasonable estimate of Australian trends albeit at a smaller magnitude. Total tax claims for ESS payments grew from \$1.66 billion (N=1,014) in 2009-10 to \$3.81 billion (N=1,124) in 2013-14. There is evidence of an increasing trend in the number of firms, particularly small firms (1 to 20 employees) reporting ESS payments. ATO data includes a number of ESS schemes that may inflate the figures.

Figure 2.1: Total share based payments by firm size and age class, 2006–07 to 2014–15



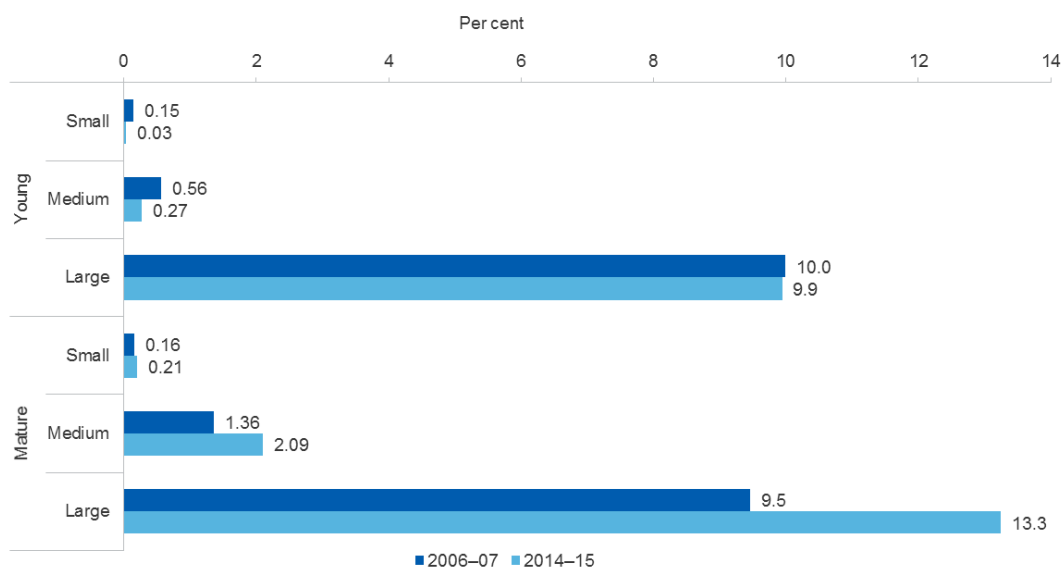
Notes: Data is the weighted sum of employee share based payments and stock options, expensed to businesses/organisations for remunerating employees accrued over each financial year. Small firms have 1–19 employees, medium firms have 20–199 employees and large firms have 200+ employees. Young firms are less than 6 years old, mature firms are 6+ years old. See Appendix 1 for a more detailed explanation of firm size and age classes. Averages incorporate all industry classes.

Source: ABS (2016) *Economic Activity Survey 2006–07 to 2014–15*

The incidence of ESS in Australian firms grew from 0.23 per cent to 0.57 per cent of firms from 2006–07 to 2013–14. The 2014–15 data showed a sharp decline from 0.57 per cent (2013–14) to 0.26 per cent. This may reflect a decline in the incidence of small and medium firms using ESS. However, the proportions are so low that interpretations of significance are problematic. Looking at the use of ESS by firm size and age (Figure 2.2), a significant upward trend in the proportion of firms using ESS can be seen in mature, large firms only.

There is considerable variation in the incidence of ESS across different firm sizes, ages and sectors. The likelihood of ESS uptake increased with firm size and age (Figure 2.2; Table 2.1). Large and very large firms with more than 200 employees are approximately three to five times more likely to have an employee share scheme than firms with 20–199 employees. Very large firms (with 500 or more employees) are approximately 1.6 times more likely to have an ESS than those with 200–499 employees (data not shown). The incidence of share based payments is highest in *Mining, Professional, scientific and technical services, Wholesale trade* and *Financial and insurance services*. ESS is least likely in the *Education and training, Arts and recreation services, Other services* and *Agriculture* sectors.

Figure 2.2: Average incidence of share based payments by firm size and age, 2006–07 and 2014–15.



Notes: Small firms have 1–19 employees, medium firms have 20–199 employees and large firms have 200+ employees. Young firms are less than 6 years old, mature firms are 6+ years old. See Appendix 1 for a more detailed explanation of firm size and age classes. Averages incorporate all industry classes.

Source: ABS (2016) *Economic Activity Survey 2006–07 to 2014–15*

Probit regression (Table 2.1) was used to calculate the likelihood of a firm having an ESS based on the firm characteristics of size, age and industry. There was a significant positive effect of firm age and size on the incidence of ESS in Australian firms. ESS also varies by sector. These effects persist over the period examined. For example the likelihood of a very large (500+ employees), mature (11+ years old) mining firm in 2014–15 having an employee share scheme is approximately 47 per cent. In contrast, the likelihood of a very large (500+ employees), mature (11+ years old) organisation in the *Education and training* industry having an ESS in 2014–15 is 0.5 per cent.

Based on Australian Tax Office records, the number of employees receiving ESS payments between 2009–10 and 2013–14. This number increased from 227,000 to 335,000 (or approximately 2.07 per cent to 2.91 per cent of the labour force, respectively) (Table B1).<sup>25</sup> Disaggregating employee numbers by estimated gross income per employee reveals that growth in employees is highest in the high income categories (e.g. \$180,000 or higher has a compound annual growth rate of 17.4 per cent).

## 2.2 ESS intensity is higher for SMEs

Based on Economic Activity Survey (EAS) data, average total ESS expenditure per firm per annum was \$1.58 million and average ESS payments per

<sup>25</sup> This excludes a small fraction of employees that was not matched to firms. Total labour force numbers came from ABS data (6202.0 - *Labour Force, Australia*, Apr 2016).

employee per annum were \$10,200, from 2006–07 to 2012–13. There was significant variation in the data by age, size and sector. Median total annual ESS expenditure was \$188,000 per firm and median annual ESS expenditure per employee was \$700.<sup>26</sup>

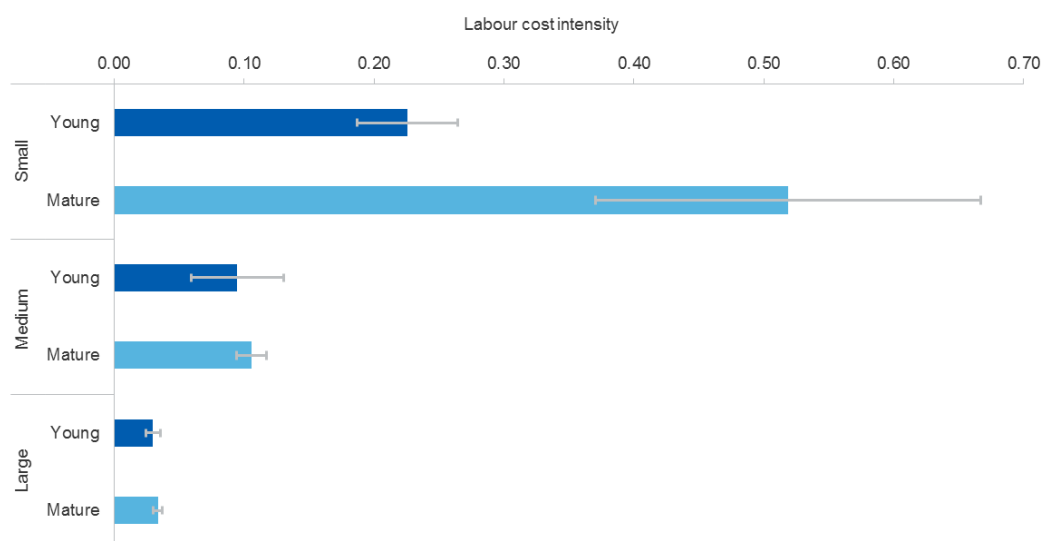
An annual ESS intensity measure was constructed from the EAS data. Annual ESS intensity was measured by the dollar amount of share based payments divided by the total dollar amount paid for all wages and salaries. The average ESS intensity of all firms with an ESS was 6 cents of share-based payments for every dollar spent on labour. This varies considerably by firm size, age and sector (Figure 2.3; Tables B2 & B3). Generally the ESS intensity declines with increasing firm size (Figure 2.3). Small firms are significantly less likely to use ESS than other firms. However, when small firms do use ESS, ESS payments make up a significantly higher share of annual total labour costs (Figure 2.3). For every dollar spent on wages and salaries in young, small ESS firms, an average of 25 to 50 cents were paid to employees in the form of share based payments (Figure 2.3).

By contrast, large organisations, regardless of age, only paid 3 cents in the form of share based payments for every dollar spent on labour. Furthermore, SMEs in the mining industry appear to have a higher ESS intensity (35 cents) compared to SMEs in other industries (Table B2). A significant decrease in median ESS intensity was observed in 2008–09 for small firms of all ages (Figure 2.4). Larger firms were not as significantly affected.

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<sup>26</sup> Using tax office data, average total ESS expenditure per firm was \$2.12 million per firm and average ESS payments per employee were \$64,600 within the reference period 2009-10 to 2014-15. Median total ESS expenditure was \$141,000 per firm and median ESS expenditure per employee was \$16,069.

Figure 2.3: Average ESS intensity of share based payments, by firm size and age class, 2006–07 to 2014–15



Notes: ESS intensity is the total amount of share based payments divided by the total amount of wages and salaries. Bars are standard errors. Small firms have 1–19 employees, medium firms have 20–199 employees and large firms have 200+ employees. Young firms are less than 6 years old, mature firms are 6+ years old. See Appendix 1 for a more detailed explanation of firm size and age classes.

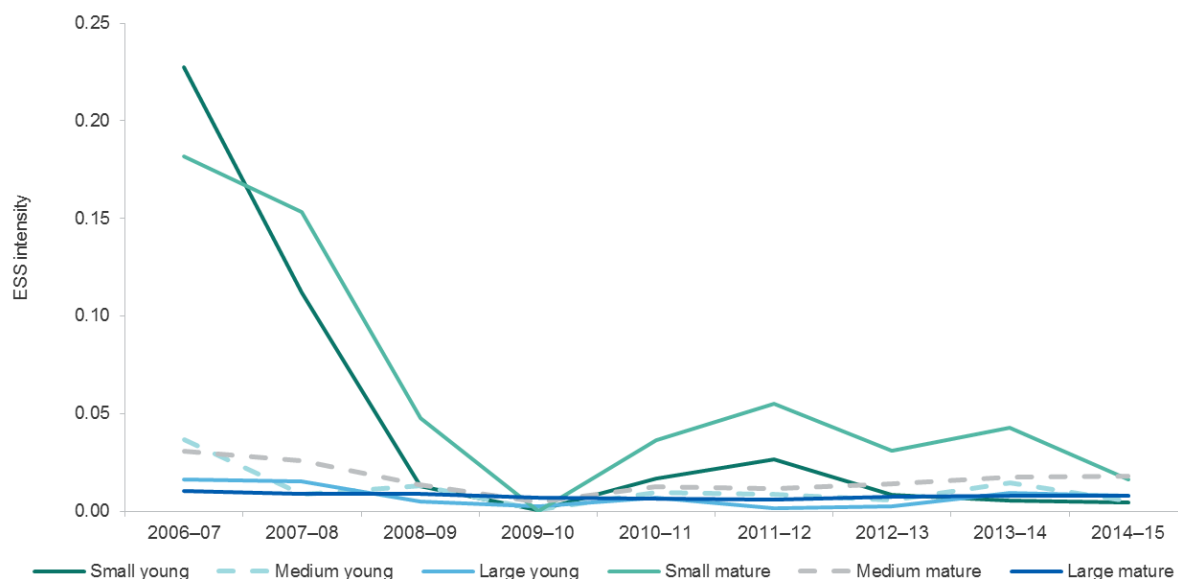
Source: ABS (2016) *Economic Activity Survey 2006–07 to 2014–15*

Tax data were used to support the analysis of ESS intensity. Figure B1 uses ATO data to show that there is a negative relationship between firm size and the proportion of employees in a firm receiving ESS, consistent with the above EAS data.<sup>27</sup> Preliminary exploration of the data indicated that the relationship between firm size and the proportion of employees receiving ESS was not becoming more negative over time. The evidence that ESS payments per employee varies with firm size class is inconclusive.<sup>28</sup>

<sup>27</sup> A one way ANOVA revealed highly significant differences between the proportion of employees receiving ESS (variable was arcsine transformed) and firm size category ( $F(7, 6248) = 316.6$ ,  $p < 0.0001$ ). Tukey post analyses revealed significant differences between most of the firm sizes with the exception of some of the larger size classes.

<sup>28</sup> The significant effects shown in the present statistical analysis were strongly influenced by outliers in the data.

Figure 2.4: Median ESS intensity measure of firms that indicated the existence of an employee share scheme by firm size, 2006–07 to 2014–15



Notes: ESS intensity is the total amount of share based payments divided by the total amount of wages and salaries. Small firms have 1–19 employees, medium firms have 20–199 employees and large firms have 200+ employees. Young firms are less than 6 years old, mature firms are 6+ years old. See Appendix 1 for a more detailed explanation of firm size and age classes. Averages incorporate all industry classes.

Source: ABS (2016) *Economic Activity Survey*, 2006–07 to 2014–15

There is an inverse hyperbolic-type relationship between ESS payments per employee and the number of employees receiving ESS in Australia (Figure B2). This relationship was revealed when comparing the pooled distribution of the 1,000 firms with the highest ESS payments per employee (average \$314,000 per employee per annum) with the 1,000 firms with the lowest ESS payments per employee (average \$7,000 per employee per annum) against the proportion of employees receiving ESS payments in those groups (Figure B3). More than half of the top pooled 1,000 firms were narrow-based schemes ( $\leq 5$  per cent of employees receiving ESS) compared with one quarter of the bottom 1,000 firms. Figure B4 shows that narrow-based schemes, where  $\leq 5$  per cent of employees received ESS, were favoured by medium, large and very large firms whereas broader schemes were favoured by smaller firms. ATO data was not available by age. The top 1,000 firms had considerably fewer micro-market segment firms ( $N = 87$ ) compared with the bottom 1,000 ( $N = 197$ ).<sup>29</sup>

<sup>29</sup> Micro-market firms are defined as having total business income between  $-\$2$  million to  $+\$2$  million.

Table 2.1: Binary probit regression on the incidence of employee share scheme dummy

	Variable	Coefficient	Standard Error
Age Dummies	Age (3 to 5 years)	0.0151	(0.0405)
	Age (6 to 10 years)	0.0316	(0.0364)
	Age (11 years +)	0.206***	(0.0352)
Size Dummies	Small (5–19 employees)	0.252***	(0.0247)
	Medium (20–199 employees)	0.663***	(0.0202)
	Large (200–499 employees)	1.133***	(0.0234)
	Very Large (500+ employees)	1.396***	(0.0235)
Industry Dummies	Mining	0.969***	(0.0365)
	Manufacturing	0.0820**	(0.0344)
	Electricity, Gas, Water and Waste	0.169***	(0.0485)
	Construction	0.179***	(0.0392)
	Wholesale	0.377***	(0.0387)
	Retail	0.0875**	(0.0425)
	Accommodation and Food	-0.183***	(0.0482)
	Transport, Postal and Warehousing	-0.0819**	(0.0407)
	Information Media and Telecommunications	0.431***	(0.0422)
	Finance and Insurance	0.633***	(0.0408)
	Rental Hiring and Real Estate	0.0862**	(0.0404)
	Professional, Scientific and Technical	0.546***	(0.0363)
	Admin and Support	0.0838**	(0.0397)
	Public Admin / Education / Health	-0.117***	(0.0364)
	Arts and Recreation	-0.326***	(0.0554)
	Other Services	-0.295***	(0.0517)
Time Dummies	2007–08	0.229***	(0.0307)
	2008–09	0.171***	(0.0289)
	2009–10	0.367***	(0.0270)
	2010–11	0.243***	(0.0282)
	2011–12	0.266***	(0.0280)
	2012–13	0.201***	(0.0282)
	2013–14	0.216***	(0.0281)
	2014–15	0.218***	(0.0289)
	Constant	-2.872***	(0.0496)
	Number of Observations	167,074	
	LR $\chi^2_{31}$	11337.1	
	Log Likelihood	-24418.293	
	Pseudo R <sup>2</sup>	0.1884	

Notes: The above binary regression can be used to compare the likelihood of a firm having an ESS based on its characteristics of age, size and industry in a given year. Probabilities are calculated using the standard normal density curve. For example, the likelihood of a very large (500+ employees), mature (11+ years old) mining firm in 2014–15 having an ESS is  $F(-2.872+1.396+0.206+0.969+0.218) = 46.7\%$ . This can be compared to the likelihood of a large (500+ employees), mature (11+ years old) firm in the education and training industry in 2014–15 having an ESS:  $F(-2.872+1.396+0.206-0.117+0.218) = 0.52\%$

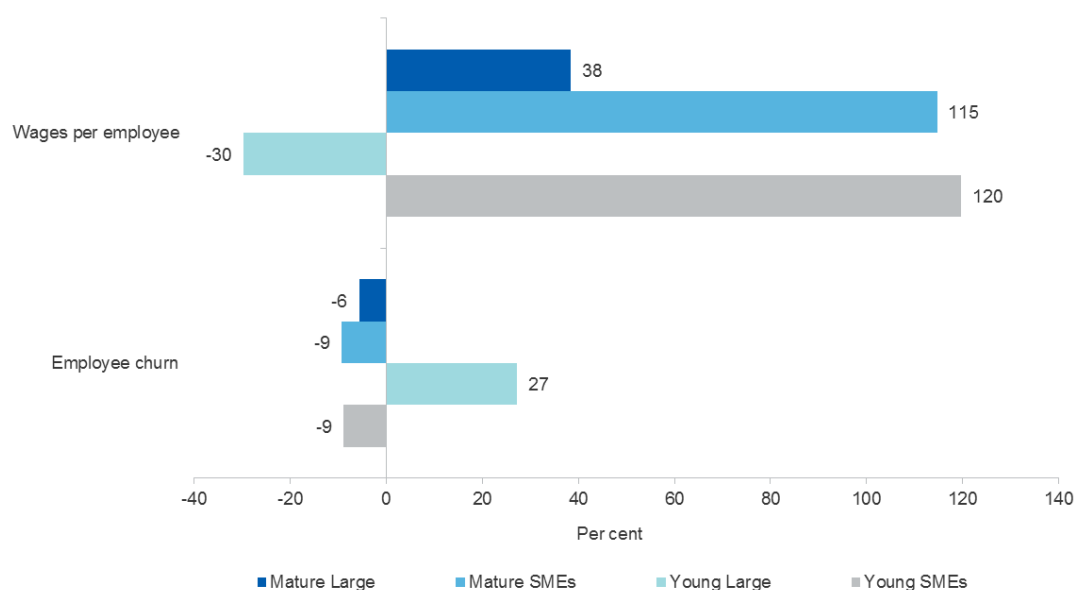
Source: ABS (2016) *Economic Activity Survey, 2006–07 to 2014–15*

### 2.3 Firms with an ESS generally have a lower employee churn and higher wages per employee

The difference between ESS and non-ESS firms for average employee churn and average wages per employee is shown in Figure 2.5. The data indicates that employee churn is lower in firms with an ESS, usually by a few per cent. Over the period from 2006–07 to 2011–12, average employee churn across all sampled firms was 32 per cent, while employee churn for firms that had an ESS was significantly lower at 29 per cent (Tables B4 and B5). Wages per employee were found to be significantly higher in ESS firms compared to other firms. This result is consistent across all size, industry and age groups. Unlike other firms, young, large firms with ESS exhibited higher employee churn and lower wages per employee compared with their non-ESS counterparts. Large *Retail trade, Accommodation and food services* and *Electricity, gas, water and waste services* firms with ESS exhibited lower wages per employee compared with their non-ESS counterparts.

ATO data shows that around half of the employees receiving ESS payments had gross incomes greater than \$100,000 per annum. The higher income categories were growing significantly faster than the low income categories (Table B1).

Figure 2.5: Mean difference of wages per employee and employee churn between ESS and Non-ESS firms, by size and age class, 2006–07 to 2012–13



Notes: This figure shows the differences between means (ESS minus non-ESS) in per cent terms. For example mature, large firms with ESS had 38 per cent higher wages per employee than their non-ESS counterparts. See Appendix 1 for a more detailed explanation of firm size and age classes. Annual employee churn is defined as:  $1 - (\text{number of unique employees identified in both periods} / \text{number of employees in the first period})$ .

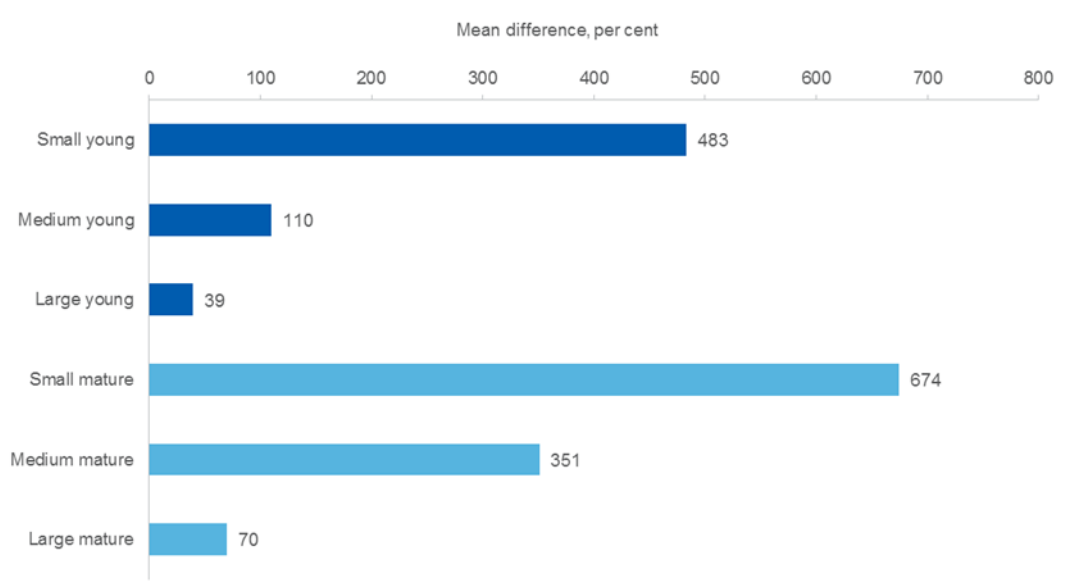
Source: ABS (2015) *Economic Activity Survey, 2006–07 to 2012–13*

## 2.4 Firms with an ESS exhibit superior financial performance

Firms with an ESS exhibit significantly higher value added per employee compared with non-ESS firms (Figure 2.6). In the case of small ESS firms, productivity was up to six times higher than non-ESS firms. Similar higher performance trends were found for sales and wages per employee (Table B3). The higher relative productivity and financial performance associated with ESS declined with firm size. Young, medium and young, large firms did not exhibit as high a mean difference as their mature counterparts, especially for sales per employee. Young, large firms with ESS did not show a significantly higher performance compared with their non-ESS counterparts. These financial performance results were generally consistent across all sectors. Large *Retail trade, Accommodation and food services* and *Electricity, gas, water and waste services* firms with ESS had lower value added per employee compared with their non-ESS counterparts (Table B3).

The three year historic growth trends in sales per employee and value added per employee for firms known to use ESS in 2012–13 are shown in Figure B5. The evidence suggests that, compared with their non-ESS counterparts, SMEs utilising ESS had higher growth rates. This is not the case for large firms.

Figure 2.6: Mean difference of value added per employee between ESS and Non-ESS firms, by size and age class, 2006–07 to 2014–15



Notes: This figure shows the differences between means (ESS minus non-ESS) in percentage terms. For example small, young firms with ESS had almost five times greater labour productivity than their non-ESS counterparts. Small firms have 1–19 employees, medium firms have 20–199 employees and large firms have 200+ employees. Young firms are less than 6 years old, mature firms are 6+ years old. See Appendix 1 for a more detailed explanation of firm size and age classes. Averages incorporate all industry classes.

Source: ABS (2016) *Economic Activity Survey, 2006–07 to 2014–15*

### 3. Discussion

ESS are not commonly used in Australian firms, but can be found in firms of all ages, sizes and sectors. Firms (especially SMEs) with an ESS demonstrate superior performance in employee retention, labour productivity, sales and value added growth compared with their non ESS counterparts.

Economic theory highlights the importance of employee share ownership in recruitment and retention of employees, particularly for smaller and unlisted firms.<sup>30</sup> The results support the employee retention argument and, unlike the financial performance data discussed below, is consistent for firms of all sizes. Firms employing ESS have marginally lower employee churn, which is nevertheless statistically significant.

The existence of ESS in Australian firms is positively correlated with labour productivity. The present results refute the argument by Landau *et al.* (2013) that Australian Government ESS policy is based on a false premise. The correlation is strongest for SMEs that appear more reliant on ESS as a wage substitute. This confirms earlier US findings<sup>31</sup> and contradicts both Finnish panel data results and a reversed size effect observed in US firms.<sup>32</sup> Despite the stronger correlation with SME performance, large, mature firms are significantly more likely to use ESS compared to young SMEs in Australia. The results therefore give support to the most recent ESS policy announcement<sup>33</sup> to limit the requirement for public disclosure of ESS documents to encourage the take-up of ESS in start-ups, but not small firms.

However, this policy change may stimulate unlisted start-up performance. One of the least common reasons for adopting ESS in Australia is to take advantage of tax concessions.<sup>34</sup> The lower liquidity of unlisted firms and the difficulties in determining objectively the fair market value, both at the time of take up and the employee's exit, are fundamental difficulties in implementing broad-based employee share plans in unlisted firms.<sup>35</sup>

Given the EAS dataset is a randomised, stratified survey of 20,000 Australian firms, the results do not suffer from sample selection bias inherent in many previous studies. However, ESS is often implemented alongside other employee incentives<sup>36</sup> so it is difficult to determine causality if the incidence of ESS is a proxy indicator for a better managed firm.<sup>37</sup> Future research is needed to conduct time-series analysis with more detailed firm matching in order to see if these results hold after controlling for omitted variable bias and reverse causality.

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<sup>30</sup> See Landau *et al.* (2013)

<sup>31</sup> Conyon & Freeman (2004); Sesil & Lin (2011); Blasi *et al.* (2016)

<sup>32</sup> Jones *et al.* (2010); Kroumova & Sesil (2005)

<sup>33</sup> On 1 December 2016 a measure was introduced into Australian Government Parliament as part of the Treasury Laws Amendment (Measures No.1) Bill 2016 so that disclosure documents for ESS will not be made public if all the companies in the group are unlisted, have been incorporated for less than 10 years and have an aggregated turnover of less than \$50 million. These requirements mirror those in the definition of a start-up for the purposes of the start-up concession discussed in Box 1.2. See also National Innovation and Science Agenda (2015); Treasury (2016).

<sup>34</sup> Landau *et al.* (2013) p.20

<sup>35</sup> Landau *et al.* (2013) p.55

<sup>36</sup> Pendleton (2001); Robinson & Wilson (1992)

<sup>37</sup> Sesil & Lin (2011); Blasi *et al.* (2016)

The data shows a distinct size effect on labour productivity that coincides with increasing ESS intensities. This could suggest a causal relationship interacting with a free-rider effect. Australian ESS policy may therefore benefit from additional incentives that either: encourage collective shareholding by employees (e.g. trusts) to limit the 'free rider' problem, or incentivise complementary management practices (e.g. high information sharing) that encourage an innovative, cooperative culture.<sup>38</sup>

The results are consistent with previous Australian research showing that ESS was most common in large, publicly listed companies<sup>39</sup> and that executive share plans were far more common in Australia than broad-based plans.<sup>40</sup> One measure of the significance of employee share ownership in Australia is the extent, or incidence, of such schemes and the type of firms in which such schemes exist. This is important because it indicates whether the regulatory model tends to either encourage or inhibit the use of ESS and if the types of firms engaged in an ESS match policy rationale. The incidence of ESS in Australian firms is growing but appears low relative to European and US firms.<sup>41</sup>

It should be noted that the *Economic Activity Survey* is not designed to capture robust annual ESS data with only around 5 per cent of the sample reporting the use of ESS annually. Future ESS research would benefit from the questions becoming a more significant design variable in the Survey or from development of a specialised official survey on ESS usage in Australia. The ABS is planning to include two ESS questions in the latest Major Labour Cost survey for the 2015–16 reference year.

Furthermore, the *Economic Activity Survey* could differentiate between narrow and broad-based schemes. There is no standard definition of narrow-based schemes internationally. Although the data shows that firms exist along the entire spectrum, the assumption that a proportion of employees receiving ESS of less than 5 per cent may serve to roughly distinguish between narrow and broad. However, a more reliable distinction between executive/management reward schemes and other forms of ESS would improve understanding of the impact of ESS on longitudinal firm performance in Australia.<sup>42</sup>

The ATO evidence provides a useful dataset to examine the existence of broad vs. narrow schemes and could be better used to examine firm performance. Future work by the ABS and the ATO to clean and connect this dataset to other ATO-held firm performance data or the ABS's Business Longitudinal Analysis Data Environment would make this analysis possible. The new ABS Major Labour Cost survey includes ESS acquired under government approved schemes and those not part of an approved scheme. This should generate higher quality ESS cost data allowing better harmonisation and integration with the ATO data. Analysis of this dataset would also allow better assessment of the policy which uses firm turnover rather than firm employment size to determine who benefits from the tax concessions.

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<sup>38</sup> Sesil *et al.* (2004); Conyon & Freeman (2001); Kruse & Blasi (1995)

<sup>39</sup> ESODU (2004) cited in Landau *et al.* (2013)

<sup>40</sup> Employee Share Ownership Development Unit Research as cited by Landau *et al.* (2013); KPMG (2003) as cited by Landau *et al.* (2013)

<sup>41</sup> See Kruse *et al.* (2010); Hashi & Hashani (2013). Noting that the survey results are not sampled in the same way.

<sup>42</sup> See Landau *et al.* (2013) pp.251-253

ESS take-up by employees in small firms appear to be more sensitive to economic conditions than government regulation. The examined period covers the change to operation of the previous legislative regime governing ESS (Division 83A), effective on 1 July 2009. ESS advocates have argued that the 2009 legislative changes reduced the incidence and intensity of ESS, citing a survey of 500 employers.<sup>43</sup> Over the examined period, the incidence of ESS increased across almost all firm sizes, ages and sectors and showed little change in 2009–10.

ESS intensity did, however, vary considerably over time, particularly for young, small firms. This has been explained as the effect of increased compliance costs and additional administrative complexity introduced by the Division 83A changes.<sup>44</sup> However, the largest declines in median ESS intensity occurred in 2008–09 suggesting that take-up of ESS by small firm employees was more sensitive to poor or uncertain economic conditions such as the global financial crisis than policy changes.

Employees have less discretionary income and a lower ability to diversify their financial risks than conventional investors.<sup>45</sup> ESS shifts these risks back onto employees which may explain why employees would be reluctant in a financial crisis to accept or cash in firm shares. Unfortunately a longer period of data, including the 2015 policy change, was unavailable from either the *Economic Activity Survey* or the ATO dataset at the time of this research. Future revisions of this work would further indicate whether ESS incidence and ESS intensity are largely insensitive to policy change.

Based on the evidence, this paper argues that ESS tax policy in Australia should exclude narrow-based (executive remuneration) where any productivity dividend from public support would be expected to be lowest. There is increasing international evidence that broad-based ESS generates greater benefits to firm performance if regularly offered to employees.<sup>46</sup> The ATO data suggests that narrow-based ESS are used by larger firms and their share appears to be growing, presumably costing the Australian public more over the medium term. These effects are suggested in the Australian dataset.

Australian firms with ESS have significantly higher wages per employee than similar non-ESS firms suggesting that ESS payments are not a substitute for wages. However, the ESS intensity measure indicates that young, SMEs exhibit a high total wage substitution effect. This finding is consistent with feedback received by the Australian Treasury through its recent public consultation on ESS.<sup>47</sup> The results indicate that employee equity is being used as a mechanism for overcoming the relative disadvantages faced by start-ups and older SMEs when it comes to cash-based remuneration packages. The tax data supports the notion that high wage or salary earners in Australia are more likely to be in receipt of ESS payments. The sectoral composition of ESS firms suggests that they may be using ESS to help attract and retain employees with highly sought after technical and/or innovation skills that already command high wages or salaries. This is supported by other recent analysis showing that

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<sup>43</sup> Employee Ownership Australian & New Zealand (2013)

<sup>44</sup> *Ibid*

<sup>45</sup> Landau *et al.* (2013)

<sup>46</sup> Sesil & Lin (2011)

<sup>47</sup> Treasury (2016)

individuals with science, technology and engineering skills earn wages and salaries above the national average.<sup>48</sup>

The findings also indicate a more employee-driven rationale for the uptake of ESS. In Australia, employee resistance was the most cited barrier for businesses implementing ESS in 2004.<sup>49</sup> Financial factors appear to be more important than income or risk preferences.<sup>50</sup> Dewe *et al.* (1988) argued that employees adopt ESS when they are more positive to ESS in general rather than specific attitudes towards their employer. This cultural phenomenon could explain the relatively low incidence of ESS in Australia compared with other countries such as the US. Employees tend to view their equity stake in the firm as an investment, rather than a way of having a greater say in the way the firm is operated. Future research would therefore benefit from the development of a comprehensive and empirical framework for employee decision-making regarding ESS based on earlier work by Brown *et al.* (2008).

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<sup>48</sup> Office of the Chief Scientist (2016) <http://www.chiefscientist.gov.au/2016/03/report-australias-stem-workforce/>

<sup>49</sup> TNS Social Research (2004); ESODU (2004) as cited by Landau *et al.* (2013); Kroumova & Sesil (2006)

<sup>50</sup> Pendleton (2005)

## Appendix A Data and methodology

This study utilises two main data sources: the Business Longitudinal Analysis Data Environment and ATO data supplied via a Smarter Data request.

### A.1 Business Longitudinal Analysis Data Environment (BLADE)

The ABS' BLADE is a series of integrated, linked longitudinal datasets over the period 2001–02 to 2014–15. It is based on retrospectively reconciling the different reporting structures in ATO and ABS data to facilitate linking survey and administrative data for businesses.

The survey data used here is from the *Economic Activity Survey* (EAS), while the administrative data is sourced from the Australian Taxation Office and includes Business Activity Statements (BAS) and Pay-As-You-Go (PAYG). In addition, demographic information, such as firm age or industry classification, are derived by a combination of data from the ABS Business Register and historical ATO reporting patterns.

EAS uses stratified random sampling to produce population estimates of economic activity in Australia as published in *Australian Industry* (ABS cat no 8155). EAS data is collected annually for the fiscal year ending June 30 and each iteration contains approximately 20,000 units; however exact sample sizes will vary by year. The EAS is not designed to generate robust ESS estimates. Only around 5 per cent of the sample report using an ESS annually. This value initially appears very low compared with other countries (see Landau et al. 2013).

EAS scope includes most, but not all, industries. Notably, units classified to general government or *Finance and Insurance* are mostly excluded. More details on scope are available in the explanatory notes of ABS catalogue number 8155.0.

EAS data is cross-sectional and only significant contributors to an industry are likely to be selected from year to year. Nevertheless, the ATO data is longitudinal and thus can be combined with EAS to analyse firm performance pre and post inclusion in the survey.

The present study contrasts ESS and non-ESS firms of the same age, size class and sector recognising that these firms are likely to use the same labour market and have similar human resource management practices (See Boxes A1 & 2 and Table A1 for a list of definitions). Most international studies examining the effects of ESS on productivity use cross-sectional data (See Kruse et al. 2010 for a review).

Unlike the work of Blasi et al. (2016) the present authors did not have access to employee level information about incentives and decision-making of both firms and employees regarding ESS. Therefore this paper is limited to empirical validation without being able to factor in behavioural implications. This research paper would not have benefitted from a re-examination of the long term employee level data held by Australian Bureau of Statistics since the data is only collected every five years and was not produced in 2014. Further, there is

likely a limited overlap in the samples, which restricts its representativeness were it available in 2014.

The EAS data used here encompasses the period 2006–07 to 2014–15. The EAS doesn't ask when the ESS was adopted. At the firm level, ESS payments can be sporadic and a lack of a payment doesn't necessarily indicate that a firm doesn't have an ESS in place (though unlikely).

Due to the exclusion of certain types of businesses in some of the analysis presented – notably sole traders – and the experimental nature of some of the statistics presented, only the incidence of ESS and total expenditure on ESS use survey weights. Further, these weighted values are only relevant for industries within the scope of the survey.

### Box 3.1: Defining firms by age and size

The firm age definitions adopted in this paper set out by the OECD. Young firms are defined as firms aged between 0 and 5 years of age. Start-ups are a specific subset of young firms within the first three years of operation (0–2 years old). Mature firms are defined as those firms aged 6 years and older.

The standard firm size classes used by the ABS are adopted. However, for the purposes of analysing Employee Share Scheme firms non-employing firms are excluded. Firm size classes are defined in Table A1. Small to Medium Enterprises (SMEs) in this case are firms that have 1–199 employees.

Table A1: Defining firms by size

Standard Australian firm employment sizes (ABS definition)
Micro (0–4 employees)
Small (5–19 employees)
Medium (20–199 employees)
Large (200–499 employees)
Very Large (500+ employees)

The significance of correlations or mean differences were tested with either Analysis of Variance or binary probit regression, while distributions were compared using Chi-square tests. Some financial data was winsorised to exclude the 1<sup>st</sup> and 99<sup>th</sup> percentile to account for outliers likely to be errors in the data recording and collection.

The relevant survey question of the EAS form asks for employee share based payments and stock options (analogous to an ESS), expensed to the business or organisation remunerating employees, and accrued during the current period. As such, this information does not discriminate between narrow or broad-based ESS.

The paper also compared three-year growth outcomes for firms with or without ESS payments. Given the longitudinal constraints discussed above, it is assumed that if a firm made an ESS payment at time  $t$  the firm had an ESS in

place over the previous three years. This assumption needs to be validated empirically and readers should exercise caution when interpreting these results.

A measure of employee turnover was derived using the formula one minus total number of employees appearing in two consecutive periods divided by the number of employees in the base year; that is, one minus the employee retention rate. This was calculated using PAYG data linked to the EABLD.

Overall, of the firms that responded to the EAS, 14 per cent were in *Manufacturing* (see Figure 4.1) and just over 11 per cent were from *Health Care and Social Assistance*. Other common industries were *Rental Hiring and Real Estate Services* (10 per cent), *Agriculture* (9 per cent) and *Transport, Postal and Warehousing* (9 per cent).

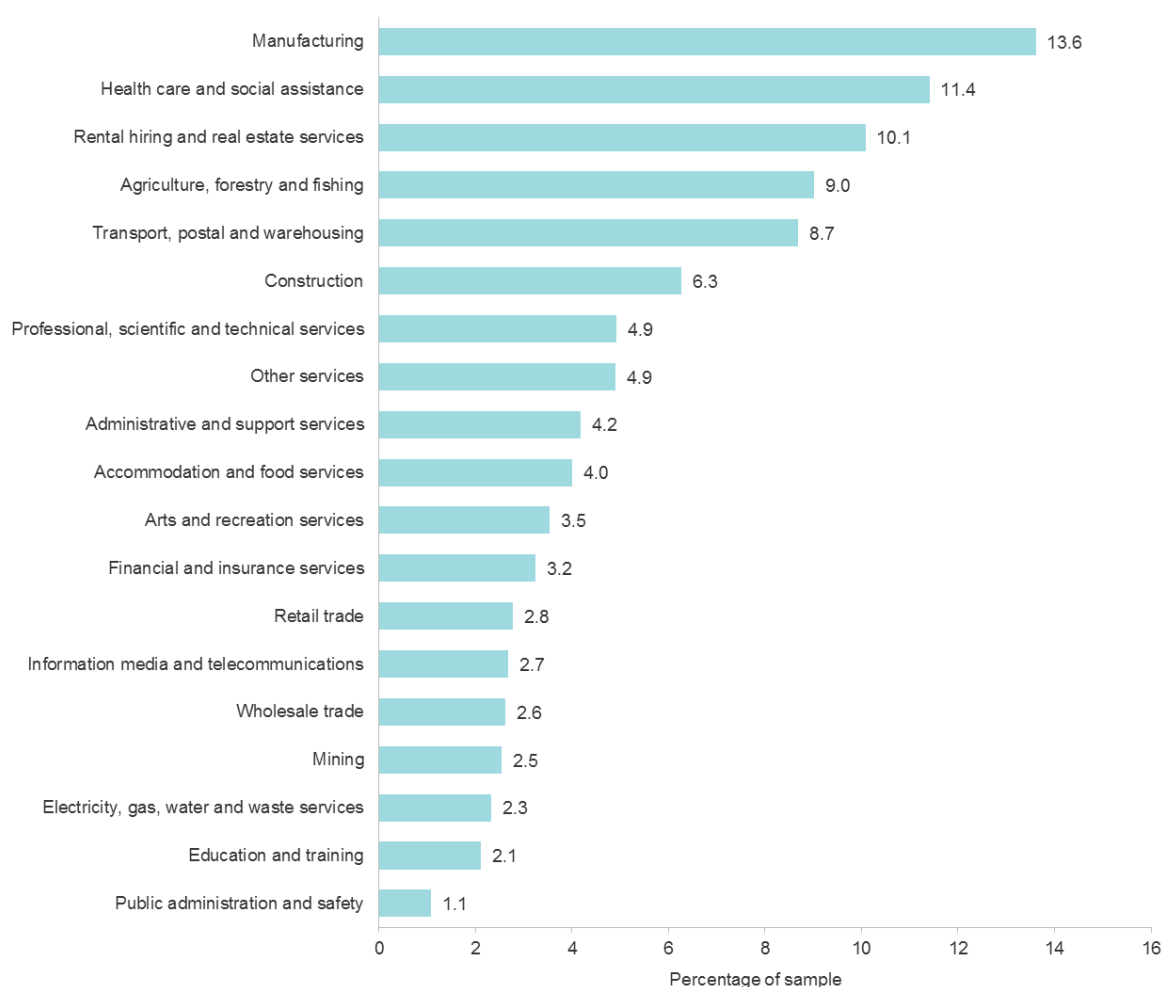
Table A2: Variable definitions

Variable	Definition
Share based payments	Employee share based payments and stock options, expensed to the business/organisation for remunerating employees accrued during the current period
ESS	Dummy variable for share based payments. ESS=1 if share based payments > 0
Wages per employee	Total wages labour cost reported divided by the derived employment total
ESS Intensity	Total amount of share base payments divided by the total amount of wages/salaries in the same period
Employee churn	The annual employment churn rate defined as: 1- (number of unique employees identified in both periods/number of employees in the first period)
Industry value added	A derived value added available in the dataset. IVA is an estimate of the difference between the market value of the output of an industry and the purchases of materials and expenses incurred in the production of that output. IVA = Sales and service income + Funding from federal, state and/or local government for operational costs + Capital work done for own use + Change in inventories - Purchases of goods and materials -Other intermediate input expenses
Labour productivity	Following (Harris et al. 2003), derived industry value added and total number of employees can be used to find a labour productivity measure defined as: (derived industry value added / derived total employment). Hours worked information was not available in the dataset.

Looking at firm size and sales in the overall sample, 52 per cent of firms reported fewer than five employees and 71 per cent had fewer than 20 employees (Figure A2). Some 6 per cent of firms reported more than 200 employees. The majority of firms in the sample (46 per cent) had an annual turnover of less than \$1 million. Some 17 per cent of firms had an annual

turnover of \$50 million or more. Summary statistics for firms that reported share based payments, versus those that did not, are detailed in the Results section and Appendix B. Only 2.5 per cent of firms in the sample indicated they had some form of an ESS at least once.

Figure A1: EAS sample proportion of firms by industry, 2006–07 to 2012–13



Notes: The graph shows the number of firms from 2006–07 to 2012–13 within the sample by ANZSIC06 industry class.

Source: ABS (2015) *Economic Activity Survey, 2006–07 to 2012–13*

## A.2 Smarter Data Request

The descriptive analysis of EAS data is supplemented with ATO supplied ESS payer and payee data (based on tax returns).<sup>51</sup> These data cover the period 2009–10 to 2014–15; however, the 2014–15 year has a high proportion of incomplete tax returns.

The dataset contains information on firm size and industry, the value of ESS payments made, the number of employees receiving ESS payments and their incomes and the type of ESS claim being made by the firm. These data did not

<sup>51</sup> Employee share scheme (ESS) payer and payee data - Smarter Data request # 370457

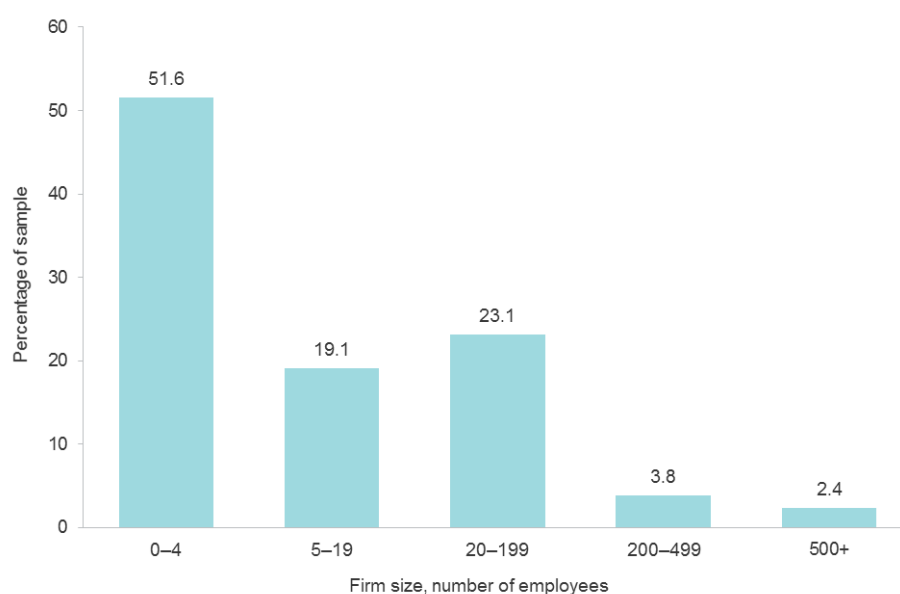
include any information on firm performance. The dataset contains approximately 7,500 individual entries.

The size of firms ranged from 1 employee to over 25,000 (median = 56 employees). The number of firms a year ranged from around 1,200 to over 1,400 firms. The 2014–15 year was excluded from trend analysis because of its low firm counts (650) and low number of completed employee tax returns. Note that the ATO data set has non-standard employment size ranges. Finally, ESS payments were recorded under one of four categories:

- ESS taxed upfront eligible for reduction
- ESS taxed upfront NOT eligible for reduction
- ESS deferral scheme
- ESS interests acquired pre 1 July 2009 with cessation during the financial year.

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Figure A2: EAS sample proportion of firms by employment size



Notes: The graph shows the number of firms from 2006–07 to 2012–13 within the sample by employment size

Source: ABS (2015) *Economic Activity Survey, 2006–07 to 2012–13*

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## Appendix B      Supplementary data

Table B1: Counts of Australian employees in receipt of ESS payments, by gross income 2009–10 to 2013–14

	\$1 to \$50,000	\$50,001 to \$100,000	\$100,001 to \$180,000	\$180,001+	Not lodged tax return	Total
2010	71,008	79,921	44,332	27,179	4,873	227,469
2011	60,577	96,732	65,782	44,913	6,281	274,421
2012	60,318	104,646	71,513	49,187	8,355	294,139
2013	56,502	105,498	75,488	59,059	12,429	309,109
2014	58,307	111,311	83,677	60,500	21,445	335,334
CAGR (%)	-3.86	6.85	13.55	17.36	-	8.07

Notes: The calculated total income is a rough figure that adds back the deductions, expenses and net losses used on the taxpayer's Income Tax Return to arrive at their "taxable income" figure. CAGR = compound annual growth rate.

Source: Australian Tax Office Smarter Data Request no 370457

Table B2: ESS intensity measure of firms that indicated the existence of an employee share scheme, by sector and firm size, 2006–07 to 2012–13

ANZSIC06 Division																			
Size	A	B	C	D	E	F	G	H	I	J	K	L	M	N	O	P	Q	R	S
0–4	0.09	0.14	0.04	0.43	0.01	0.01	0.00	0.00	0.24	0.34	0.12	0.02	0.05	0.01	0.00	0.00	0.00	0.02	0.00
5–19	0.28	0.39	0.07	0.46	0.11	0.00	-	0.23	0.21	0.05	0.27	0.03	0.14	0.00	0.67	0.02	0.01	0.28	0.01
20–199	0.09	0.36	0.09	0.22	0.08	0.01	0.01	0.57	0.22	0.16	0.07	0.18	0.15	0.02	0.00	0.05	0.00	0.01	0.13
200–499	0.02	0.18	0.05	0.17	0.02	0.04	0.02	0.05	0.03	0.06	0.09	0.07	0.09	0.03	0.00	0.01	0.01	0.08	0.02
500+	0.02	0.07	0.02	0.10	0.01	0.02	0.00	0.02	0.01	0.01	0.11	0.06	0.07	0.01	0.00	0.01	0.07	0.01	0.01

Notes: When the sample is split by size and division, in some cases, the sample size becomes very small and caution must be used when interpreting the above figures. ESS intensity was measured as total amount of share base payments divided by the total amount of wages in the same period. *Agriculture (A), Mining (B), Manufacturing (C), Electricity, gas, water and waste services (D), Construction (E), Wholesale (F), Retail trade (G), Accommodation and food services (H), Transport, postal and warehousing (I), Information and telecommunications (J), Financial and insurance services (K), Rental hiring and real estate services (L), Professional, scientific and technical services (M), Administration support services (N), Public administration and safety (O), Education (P), Health care and social assistance (Q), Arts and recreation services (R), Other services (S).*

Source: ABS (2015) *Economic Activity Survey, 2006–07 to 2012–13*

Table B3: Annual average ESS intensity, wages per employee, sales per employee and value added per employee, by firm age and firm size, 2006–07 to 2013–14

Age-Size class	ESS status	ESS intensity, per cent	Wages per employee, \$000 per FTE	Sales per employee, \$000 per FTE	Value Added per employee, \$000 per FTE
Young Small	ESS	25.0 (4.4)	768.9 (184.7)	4,659 (1,345)	1,301 (329)
	Non-ESS		46.2 (2.9)	1,499 (95)	217 (33)
Young Medium	ESS	53.0 (16.0)	113.4 (9.1)	699 (65)	199 (30)
	Non-ESS		52.1 (0.7)	431 (22)	92 (5)
Young Large	ESS	9.8 (3.8)	46.4 (2.9)	229 (20)	93 (8)
	Non-ESS		46.5 (0.8)	195 (8)	72 (2)
Mature Small	ESS	11.0 (1.3)	333.1 (55.0)	6,851 (2,270)	4,428 (1,827)
	Non-ESS		55.3 (3.3)	1,492 (105)	563 (89)
Mature Medium	ESS	2.8 (0.6)	115.1 (2.8)	1564 (131)	613 (93)
	Non-ESS		58.6 (0.3)	583 (22)	146 (8)
Mature Large	ESS	3.3 (0.4)	87.2 (1.1)	655 (22)	216 (8)
	Non-ESS		60.3 (0.3)	398 (9)	126 (2)
Analysis of Variance	Effect of ESS	n/a	***	***	***
	Effect of Age by Size class	***	***	***	***
	Interaction effect	n/a	***	***	***

Notes: Standard errors in parentheses. \*\*\* p<0.001, \*\* p<0.01, \* p<0.05.

Source: ABS (2016) *Economic Activity Survey*, 2006–07 to 2013–14

Table B4: Average annual employee churn, wages, wages per employee and share based payments per employee by ESS status, 2006–07 to 2012–13

Variable	Full sample	ESS firms	Non-ESS firms
Employee churn	0.3238 (0.2707)	0.2900 (0.1903)	0.3254 (0.2740)
Wages (\$'000's)	10,273 (56,796)	63,348 (195,724)	7869 (38,774)
Wages per employee (\$'000's)	49.35 (54.60)	96.01 (84.90)	46.99 (51.50)
Share based payments per employee (\$'000's)	7.11 (18.99)	7.11 (18.99)	- -

Notes: Standard errors in parentheses. Annual employee churn is defined as: 1-(number of unique employees identified in both periods/number of employees in the first period). The last financial year is omitted due to the nature of the employee churn calculation.

Source: ABS (2015) *Economic Activity Survey*, 2006–07 to 2012–13

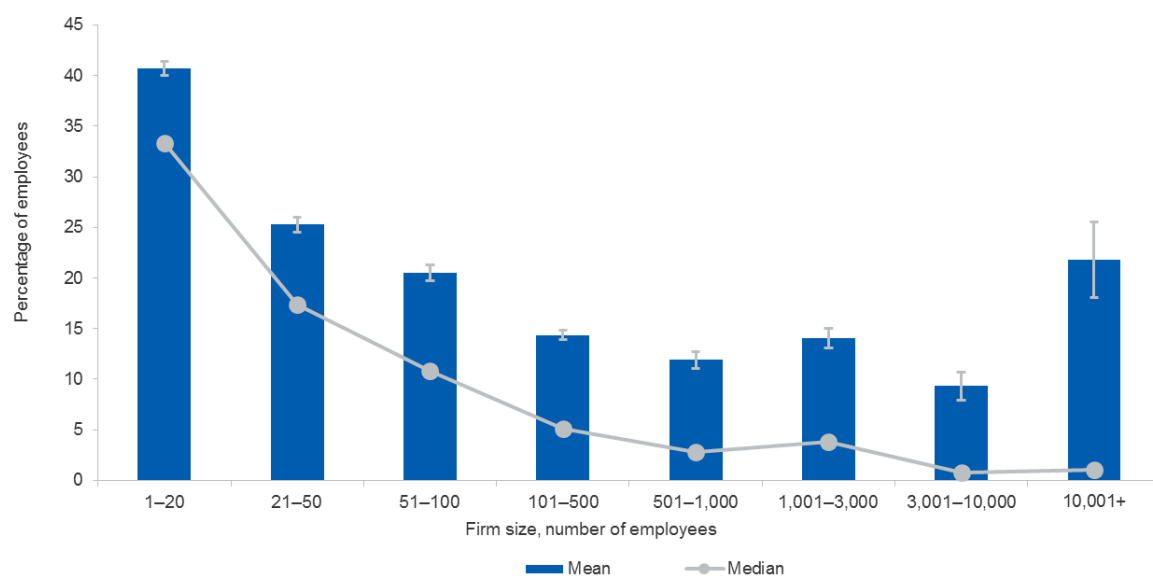
Table B5: Annual average employee churn and wages per employee, by ESS status by firm size, 2006–07 to 2012–13

Size	ESS firms		Non-ESS firms	
(employees)	Employee churn	Wages per employee (\$'000's)	Employee churn	Wages per employee (\$'000's)
0–4	0.24	137.1	0.27	30.1
5–19	0.32	127.3	0.33	48.3
20–199	0.30	106.5	0.33	55.4
200–499	0.30	83.8	0.29	58.9
500+	0.27	80.9	0.30	55.6

Notes: Annual employee churn is defined as: 1-(number of unique employees identified in both periods/number of employees in the first period). The last financial year is omitted due to the nature of the employee churn calculation.

Source: ABS (2015) *Economic Activity Survey*, 2006–07 to 2012–13

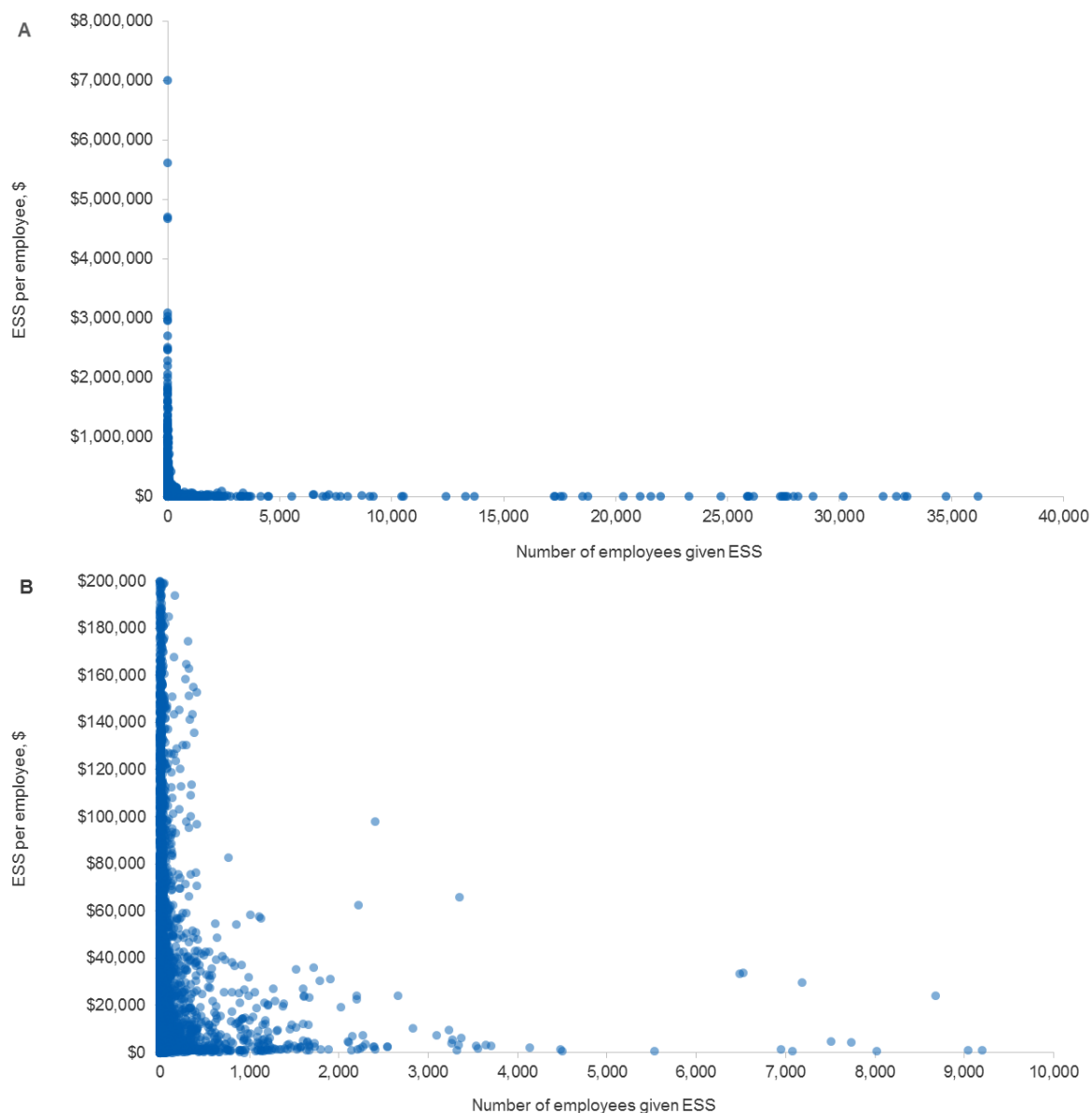
Figure B1: Percentage of employees receiving ESS in a firm, by firm size, 2009–10 to 2014–15



Notes: The bars in the plot are standard errors. N = 6,256. Firm sizes are non-standard.

Source: Australian Tax Office Smarter Data Request no 370457

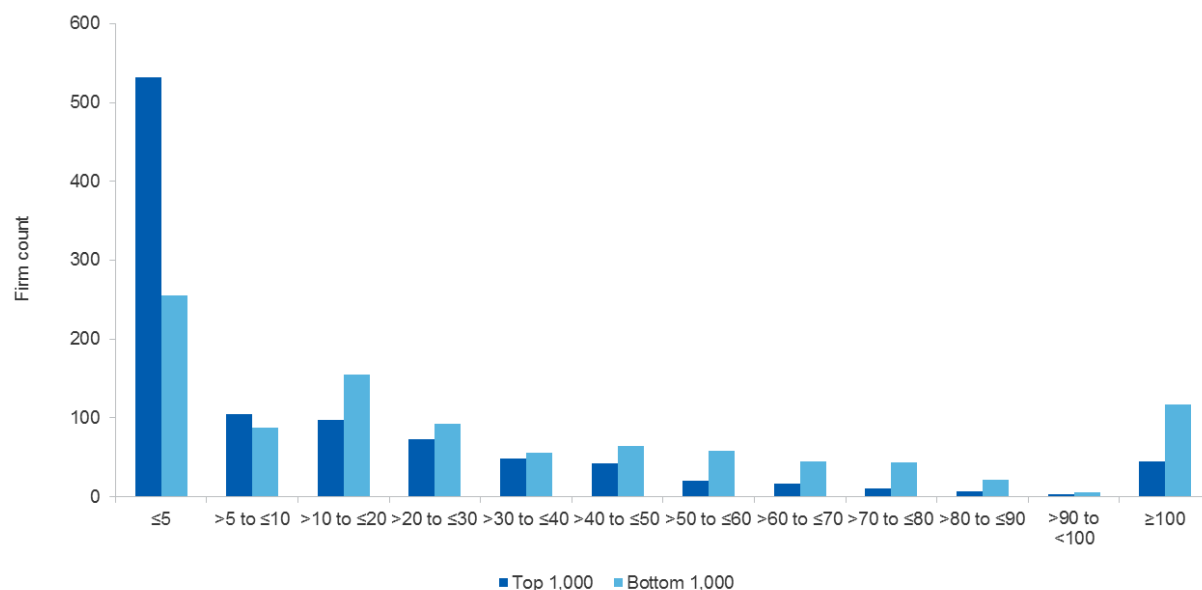
Figure B2: Annual ESS payments per employee vs. the number of employees receiving an ESS payment, 2009–10 to 2014–15



Notes: Each point represents one firm.

Source: Australian Tax Office Smarter Data Request no 370457

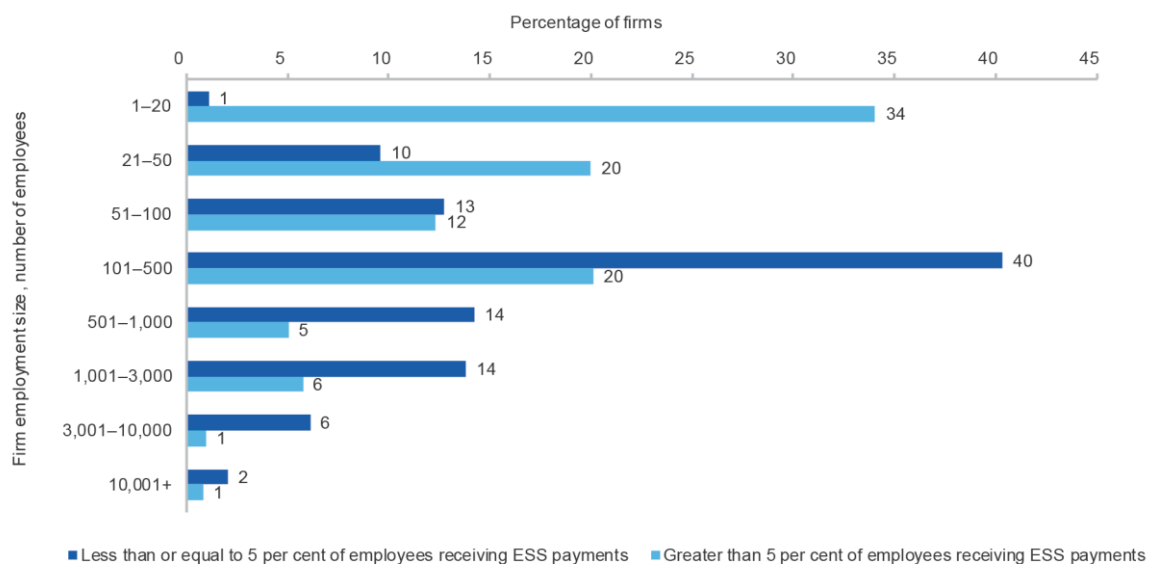
Figure B3: Frequency distribution of the top 1,000 vs. bottom 1,000 firms by ESS payments per employee, by the proportion of employees receiving ESS payments, 2009–10 to 2014–15



Notes: The distribution of firms is significantly different ( $\chi^2 = 227.05$ ,  $df = 20$ ,  $p\text{-value} < 0.00001$ ). Small categories at the tails were aggregated for presentation.

Source: Australian Tax Office Smarter Data Request no 370457

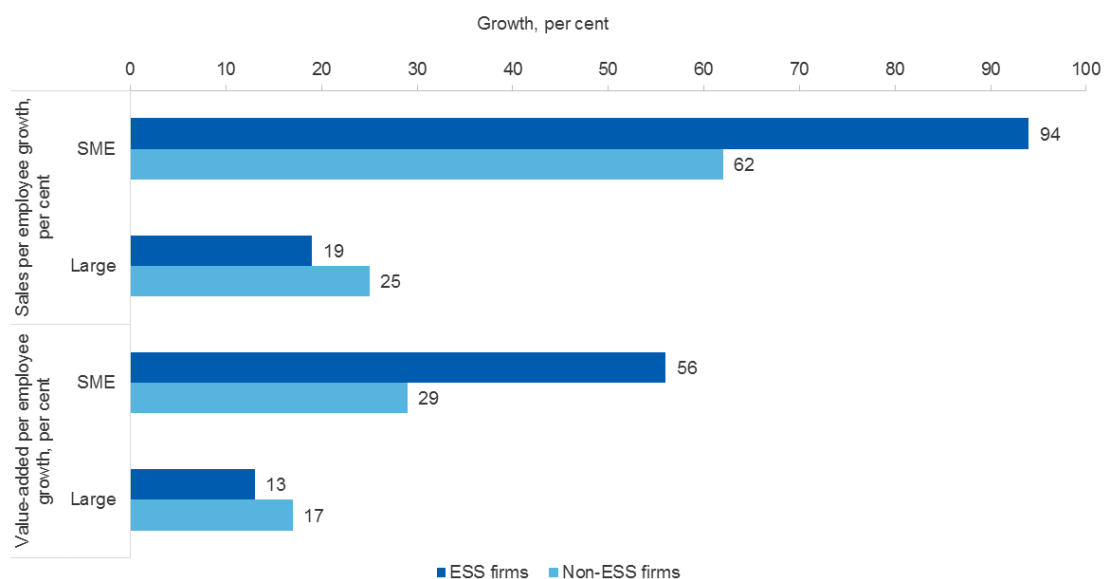
Figure B4: Frequency distribution of firms, by employment size category, by the proportion of employees receiving ESS payments, 2009–10 to 2014–15



Notes: This chart shows the proportion of firms with either ≤5 per cent or >5% of their employees receiving ESS payments in each firm size class. The distribution of firms is significantly different ( $\chi^2 = 593.42$ ,  $df = 1$ ,  $p < 0.0001$ ). Firm sizes are non-standard.

Source: Australian Tax Office Smarter Data Request no 370457

Figure B5: Average three-year growth rates in sales per employee and value added per employee, by firm age, by ESS status, 2009–13



Notes: Growth estimates were made over a three-year period. Results vary considerably with the period considered. Small to medium enterprises (SMEs) have 1–199 employees and large firms have 200+ employees. All industries are aggregated.

Source: ABS (2015) *Economic Activity Survey*, 2006–07 to 2012–13

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