On the Use of Surveys to Measure Training Costs

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ABSTRACT

Sound knowledge of the real costs of training human resources is a key input into business management and economic policy making. However, little is known about the levels, structure and variance of training costs. Existing data is limited and almost entirely case study-based. The paper compares existing estimates with the results of two recent quantitative surveys of Australian firms, which suggest average training costs are lower than commonly assumed. Contrasting the two methods suggests a useful role for surveys. Surveys can complement case studies by providing benchmark values, a measure of the cost variance across firms and allowing statistical inference.

Keywords: Training Costs, Measurement Methods.

INTRODUCTION

Increasing complexity in the management of human resources has stressed the importance to businesses of quantitative and systemic approaches to knowledge management. The management of labor turnover for instance requires an assessment of all the costs involved and now attracts the attention of researchers in various disciplines such as business or human resource management, economics and accounting. Among labor turnover costs (LTC), the value of the firm-specific training lost upon a separation or to supply upon recruitment has long been identified as a key component to assess (Oi, 1962), (Price, 1977), (Cascio, 2001). Managers need information about training costs to compute crucial ratios of return upon investment in human resources. Economists require the data to feed policy recommendations on productivity enhancing measures or to test models of labor demand with turnover costs. Accountants need the data to build human resource accounting systems. Yet, the stock of knowledge actually available about the size and structure of firm-specific training costs remains very limited. Firms make judgments about the value of training costs when making recruitment or separation decisions, so the data exists in principle. Why is it not widely available in practice?

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There is a perception by many businesses that the costs of systematically recording such data flows would outweigh the benefits (Button, 1990). Knowledge remains therefore informal. Also, there is a lack of common metrics to measure the internal composition of some intangible costs such as time or productivity costs. These “obvious and not so obvious” costs, as termed and listed by (Conner, 2002), have been the subject of much methodological research (Fitz-enz, 2002). Last, the information is often spread out between various units (HR departments, line managers etc.) and is thus difficult to gather. If the information does not originate from accounting flows, it can however be extracted externally by interviews and questionnaires. Yet, here too little is known. Direct estimates stem from a limited number of cost accounting papers and a scatter of -often less formal- case studies commissioned by industry associations. Good case study work usually provides in depth information about the size and structure of training costs within a specific firm. Whether such information can be used to infer the characteristics of these costs across organizations, sectors of activity and type of skills remains to be demonstrated.

The paper suggests a complementary approach. Multi-firms surveys, which have so far hardly been used in this area of research, offer average values by industry or by skill types against which businesses can benchmark their costs, case study researchers situate their analysis against a data continuum and policy makers formulate funding recommendations. Surveys necessarily collect less precise information on training costs components but offer a better view of the variance and trend values of these costs. The benefits from survey use are here exposed by opposing the findings of recent case studies in Australia with those of a new data set based on two multi firm quantitative surveys (hereafter referred to as the large firm survey and the small and medium enterprise survey).

FIRM SPECIFIC TRAINING

Firm-Specific Training differs from General Training in that the skills acquired can only be used in the firm and are of little value elsewhere. General training consists for instance of a university degree, or
training in Microsoft Word/Excel, while specific training refers to knowledge of company procedures, learning how to operate a specific equipment etc. One would expect general training to be financed by the employee and specific training to be financed by the firm. To be fair, the distinction between the two types of training is however far from clear cut. Firm-specific training entails cognitive elements that trainees transfer into transversal abilities transcending the specific domain for which the training was supplied. Transversal skills thus represent additional return from training to the training organization, but also raise the profile and market value of the trainee to other firms. There is also plenty of evidence that firms do subsidize some degree of general training (Acemoglu and Pischke, 1998, Booth and Zoega, 2000, Booth and Zoega, 2004, Stevens, 1994, Stevens, 2001).

Firm-specific training cost in the two surveys is defined as the cost of training a new recruit up until she reaches average productivity. It comprises induction programs and learning on the job over the training period, but there is no attempt to quantify further training costs as the recruit later moves up the wage scale. Direct training cost consists of outlays incurred by the firm while training a new recruit (say through consultancy fees). Indirect training cost refers to the time or production cost while the new recruit learns on the job and could be approximated by the wage payments, ie. wage paid to both trainee and trainer (often a manager or a colleague) over the training period, when neither is fully productive.

Table 1. Firm-Specific Training Costs

<table>
<thead>
<tr>
<th>Training type</th>
<th>Cost components</th>
<th>Measure</th>
</tr>
</thead>
<tbody>
<tr>
<td>formal or internal</td>
<td>Training outlays</td>
<td>Dollar expenditure reported by cost accounting flows, including workshop</td>
</tr>
<tr>
<td>or internal formal</td>
<td>Trainer cost</td>
<td>Training time multiplied by trainer wage.</td>
</tr>
<tr>
<td>or informal</td>
<td>Trainee cost</td>
<td>Training period multiplied by trainee wage and ideally by a factor ( \lambda \in [0,1] ) reflecting average productivity over the training period</td>
</tr>
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This cost valuation method probably overstates training costs since it assumes zero productivity for trainer and trainee over the training period. On the other hand case study work such as (Abbott et al.,
1998) has stressed how difficult it is to determine the gap between wages and the marginal product of labor over the duration of firm-specific training. The mere determination of productive time lost in informal training is a daunting task that goes beyond the monitoring techniques of many line managers and HR departments. However, the fact that much informal training necessarily escapes supervision provides a counterbalance to the over reporting correlated to cost valuation by wage.

**SURVEY CHARACTERISTICS**

The two surveys aim at providing a direct measurement of firm specific training costs for two stratified random samples of Australian businesses across all Australian States. The large firms survey consists of an online questionnaire sent to 762 large organizations employing more than 200 employees. The small and medium-sized enterprises survey proceeded by telephone interviews to a sample of 1800 small and medium businesses. The response rates are 6 and 43 percent respectively. Taken together, the two surveys cover a workforce of about 50,000 individuals.

Both surveys analyze training costs for the 16 main ANZSIC industry categories (Australian Bureau of Statistics -ABS- classification) and 6 main ASCO level II job skill types also allowing cross sectional analysis by location and firm size. The data was collected for permanent workers only. The large firms survey is more representative of white collar occupations (managers, professionals and clerks), while the small and medium-sized enterprises survey is more balanced between white and blue collar occupations. The former is endowed with matched individual wage data to cost human resources time spent on training, while for the latter average wage data for types of skills and industry was inferred from ABS data.

**A REVIEW OF EXISTING DATA**

Walter Oi found in a classic case study, (Oi, 1962), that hiring costs are substantial (over 70% of total LTC), especially firm-specific training on hiring new recruits, which alone makes up 40% of the total
adjustment cost of labor and tend to increase with the skills and wage of the worker. The proxy for a skill scale is however very rudimentary, with the three skill types analyzed belonging to the lower end of the skill distribution. (Button, 1990) presents another case study focusing on drivers staff LTC at an Australian oil distribution terminal over the year 1986. Hiring costs massively exceed firing costs, with, as in (Oi, 1962), a prominent role for training, induction and development\(^2\) cost (about 90% of LTC). More recently, (Abbott et al., 1998) provide one of the most detailed case studies in recent years. Their focus is on female managers in a large Australian financial organization and their method follows the Cascio costing formula. Firm-specific training costs represents slightly over a third of LTC, with trainee cost exceeding trainer cost by 60 percent. As in other case studies, wage information is absent from the analysis, which prevents comparisons along relative scales such as fractions of wage or total labor cost. A review of further case study material can be found in (HRMC, 2002) for Australian firms and in (Cascio, 2001) for US firms.

(Barron et al., 1997) use survey methods to report a very high ratio of informal to formal training and quantify training duration (but not cost). They find that the incidence of training rises with tenure, but provide no information on possible correlation with skills and industry types. (Abowd and Kramarz, 2003) obtain direct data on job turnover cost from business surveys run by the French statistical office (INSEE) in France in 1992. They take a structural form approach and observe that recruitment and training costs are mildly concave functions of labor adjustment, both entailing very large lumpy components for highly skilled workers. (Del Boca and Rota, 1998) provide a direct quantitative survey of 61 manufacturing firms in Northern Italy and three job types (administrative, technical and unskilled). They find hiring costs ranging between 2 and 2.6 months of labor cost, with training costs representing on average 75 to 80 percent of that figure. This survey confirms Oi’s finding that training costs rises with the skill level, with however some discontinuities.

\(^2\) The development cost component seems to refer to firm-specific but not to job-specific training programs. Button finds informal training to be relatively insignificant compared to formal and developmental training. Whether this result holds or is the result of underreporting and/or is specific to the skill examined (drivers) is not known.
Hence, recent case study estimates such as (Button, 1990) and (Abbott et al., 1998) point at very large amounts spent on training human resources in Australia. On the survey side, Del Boca and Rota (1998) find much smaller amounts and observe a large variance among firms and skill types. Since their survey focuses on medium sized firms in Italy, it appears somewhat irrelevant to compare their results with those obtained by case studies of large Australian corporations. Yet the data yielded by the two surveys in large- and small and medium-sized Australian organizations corroborates the order of magnitude as well as the structural findings of the Del Boca and Rota survey.

SURVEY ESTIMATES

The average relative value found by the two surveys for training cost amounts to 16 and 10 percent of annual labor wage cost respectively. Although this is very close to the range provided by the Del Boca-Rota study (which hovers around 17 and 20 percent of total labor cost, i.e. a lower range if made relative to wage cost only), the finding remains surprising since a recurrent finding of case studies is that this component is by far much larger than recruitment costs such as advertising, interviews, selection, relocation costs etc.

Except for the lowest skills, (Oi, 1962) reports a ratio of recruitment costs to training costs of at least ten to one. In his terminology Oi also includes ‘termination and recall costs’ to training costs, but these components add little to his figures. The data presented by (Button, 1990) reveals a ratio of almost similar magnitude (7.5:1) for drivers in an oil refinery. (Abbott et al., 1998) obtain (once the relevant concepts have been rearranged3) a ratio of at least three to one for managerial positions in a large firm. The recruitment to training ratio in the two surveys is however less than 2:1 using training costs relative to wage cost (and lower still using absolute figures).

3 Our definition of recruitment cost is matched by their “selection costs” and “entry procedures”, while training cost is matched by their “training cost” and “productivity –replacement- cost”.
Although methods differ, the cost of firm-specific training found in this study is well below the percentages found in case studies. This raises questions about the capacity of currently used methods to provide an adequate measure of these costs.

Furthermore, neither of the two surveys establishes a convincing correlation between the level of skill and training costs. In the large firm survey, a positive relationship exists in absolute (\$ cost) terms for two sectors of activity, government and construction, but this weak relationship vanishes altogether when training costs are made relative to labor wage cost. The relative approach is of course very relevant here due to the very nature of training costs (essentially valued by trainer and trainee wages). The small and medium-sized enterprise survey shows a positive relationship at the aggregate level (across all industries), but the relation disappears at the industry level (holding only in manufacturing and health).

**SURVEYS AND CASE STUDIES**

For many reasons discussed further in this section, case study data is hard to compare with survey data. Although some of the survey’s unit-record data would fit very well with the order of magnitude found in case studies, these magnitudes vanish once the data is aggregated over firms or sectors of activity, suggesting that case studies offer perhaps too narrow and too selective indicators than previously thought. To provide an example, one of the firms interviewed in a pilot project prior to the survey, a travel agent, reported incurring no training cost. Due to sharp competition between software providers, the software company provides free technical training for new corporate software users (lasting 3 months for new recruits). The issue of raising new recruits productivity is thus outsourced at no cost to the firm. It is inevitable that as we pool high training cost firms (such as those interviewed in the aforementioned case studies) with low training costs firms, the average estimate for this variable becomes somehow diluted. Case studies provide fairly accurate information on the composition of

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4 An exception is Button’s estimate of training costs, which initially amounts to 0.4*0.37=15 percent of annual total labor cost. However his developmental and induction costs raise the estimate to 0.8*0.37= 29.6 percent.
LTCs such as training costs and how they differ by skill levels within one firm, but they provide little scope for extrapolation even within the same sector, let alone other sectors or the whole economy. Also, case studies tend to systematically focus on large businesses leaving large tracts of the economy unaccounted for (Jones, 2004). Last but not least, case studies tend to follow ad hoc definitions of hiring and firing costs and are therefore difficult to compare or aggregate. (Hamermesh, 1993a) for instance comments: “the diversity of concepts behind these [case study] estimates makes their lack of agreement unsurprising. It is difficult to agree on what constitutes hiring costs and how to measure those costs after a definition is settled upon”. Certainly the same remark holds for surveys, with however the difference that surveys apply the same methodology to a large number of firms.

Case study work certainly provides the most accurate information on a single firm but does not provide the dispersion of these costs across the economy and can therefore be way off the mark when used in empirical research. Unless researchers have ground to believe that such estimates are representative of the mean training cost of an industry, or of a specific job occupation, the use of case-study data to infer the economy-wide magnitude of these costs is bound to be misleading.

The average training cost values yielded by the two surveys are consistent not only with one another but also with the very few other multi-firm studies available. As reported above, the data matches very closely the estimates of the Del Boca-Rota study. (Abowd and Kramarz, 2003) find direct training cost per worker of about two percent of the average total annual cost in their sample. They do not provide an estimate of the indirect cost but mention that the average training period varies between two and three weeks depending on skills but emphasize that their data necessarily underestimates training cost for methodological reasons. (Schiantarelli and Sembenelli, 1993) using econometric inference methods find even lower hiring and training costs. Barron et al. (1997) review six surveys of formal and informal training time and incidence in the US throughout the 80s and 90s. Most of these surveys point at total training taking about 20 weeks for new recruits. It is however bold to extrapolate training costs.

Most case studies however confess to a near impossibility to appraise some intangible hiring and firing costs.
cost information from surveys that only measure time and incidence without parameters such as the ratio of trainer to trainee wage and the rate of new recruit marginal product growth. Yet, factoring in that the wage-productivity gap decreases rapidly over that period, and that the cost of informal trainer time is lowered by significant passive training\(^6\), training cost relative to wage in these surveys may credibly remain within the bounds of a few months worth of a new recruit wage cost. The same observation probably applies to the INSEE survey data studied by (Abowd and Kramarz, 2003). Given such evidence and given the explicit instructions in the two surveys to add indirect training cost (time and productivity costs as a percentage of monthly wages) of both trainer and trainee to any explicit training outlays, there are good reasons to believe the data for training costs reported in these surveys can be taken seriously.

**CONCLUSION**

The contrast between case study and survey estimates does not particularly invalidate one approach or the other. In fact the two approaches are complementary. Case study data goes further in depth, has the benefit of direct interview feedback and makes sure no concepts are left to misinterpretation. For these reasons, case study estimates are always likely to provide higher bounds than survey estimates, which may indeed omit some components or lead to some degree of misinterpretation. This weakness of the survey approach does not invalidate it. Provided a sufficient number of case studies is available by sector of activity, one could possibly estimate the extent by which survey data underestimates case study data (if this is indeed the source of the gap) and then proportionally scale up the survey data by the estimated adequate factor to bring it into line with case study data. The next point however suggests that this would be only feasible if we had a large enough number of harmonized case studies by industries. This is currently far from being the case, which makes survey research necessary.

\(^6\) This finding is corroborated by case studies as well.
Although the survey data on average training costs contrasts sharply with case study data, single survey observations do not systematically contradict case studies. Multi firm surveys dilute outliers and extreme information, providing a more balanced view at the possible expense of average underestimation of the costs involved. The approach seems worth pursuing. Why then is the currently available direct information entirely case-study based when a complementary approach based on surveys could yield much more ambitious data sets? Many authors have emphasized the difficulties involved in measuring hiring and firing costs in a direct comparable way, but others such as (Hamermesh and Pfann, 1996) have stressed that the data should in principle be available, and pleaded for survey research to be undertaken.

The objective of this paper was to stress the importance of surveys in building a comprehensive measure of labor turnover costs. The methods and results of two direct multi-sector quantitative surveys of training costs in Australia have been compared with data originating from case studies. Surveys were shown to water down the results of case studies. Survey methods are sometimes mistrusted by economists, yet (Di Tella and MacCulloch, 2004) close their study of labor turnover costs stressing that “the relevance of the subject matter and the evidence available to the profession are so out of balance that a willingness to experiment with survey data is justified”. Given the importance of this issue to businesses, the regulatory debate and public opinion, it is surprising that the Australian Bureau of Statistics and the statistical systems of most OECD countries omit collecting the data in their business surveys, perpetuating our poor knowledge of the level, variance and structure of training costs.

Additional surveys could greatly improve our knowledge of the costs of training human resources. Further survey research could also expand the scope of quantitative surveys to the various rungs of the Barzuchetti scale (Barzuchetti and Claude, 1996), estimating the extent to which the abilities derived from initial training unfold unto performance through the actions of the relational environment, hierarchy mentoring, personal and contextual motivation etc. The average value of training successes
and failures not only matters to compute returns upon investment but also for the overall appraisal of the turnover cost of human resources.

BIBLIOGRAPHY


