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Summary for:

The Industry Training Federation

THE ECONOMIC COSTS AND BENEFITS OF INDUSTRY TRAINING

Prepared by

Dr Ganesh Nana

Kel Sanderson

Fiona Stokes

Hugh Dixon

Wilma Molano

Kelly Dustow

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Business and Economic Research Limited, BERL House, 108 The Terrace, PO Box 10277, Wellington 6143, New Zealand

T: 04 931 9200 F: 04 932 9202 info@berl.co.nz www.berl.co.nz

Industry training makes a significant contribution to the New Zealand economy.

This contribution can be observed through:

- An analysis of the costs and benefits of industry training borne by the public and private sectors.
- Experiments using the BERL computable general equilibrium (CGE) model.
- Qualitative and quantitative data and information provided through official data sources and interviews with Industry Training Organisations (ITOs), industry representatives, training advisors and Modern Apprenticeship Co-ordinators, and employers.

To quantify this contribution it is imperative to acknowledge the complexity of industry training, not only in terms of how learning takes place, but in terms of the broad range of skills, occupations, and sectors that industry training encompasses. It is also imperative to acknowledge the conduit role of ITOs between industry, employers and the labour market including potential new entrants; the tertiary education system including tertiary education providers; and the Government.

Acting as a conduit, ITOs arrange the delivery of industry training, establish recognised national qualifications for different levels of skill and experience, and provide the leadership required to ensure that future industry skill needs will be available and/or addressed.

ITOs arrange for the delivery of industry training in a classroom, in a workplace, or in a combination of these locations. This training involves practical application and theory, and is competency-based. ITOs monitor the quality and effectiveness of training delivered in a classroom by training providers, and work with employers to undertake assessment and moderation of training that occurs on-the-job.

The delivery of industry training and subsequent completion of credits and qualifications is designed by ITOs for industry. This ensures that vocational learning meets the needs of industry, and is flexible enough to succeed in a variety of work environments, and across a broad range of occupations and sectors.

In theory the model of industry training is relatively simple. In practise, however, industry training is part of the work environment and is delivered in a variety of ways to meet the needs of industry and employers. ITOs arrange the delivery of training in collaboration with employers. This is important because industry training needs to be delivered in such a way that it allows apprentices and trainees to fit training in around their work.

1.1.1 Economic costs and benefits of industry training

The economic costs and benefits of industry training are borne by four stakeholder groups – employers, employees, industry, and the Government.

The major measured cost of industry training is cash funding through the ITOs.

- The total amount contributed by industry and government to industry training has increased from $138.7 million in 2003, to $290.9 million in 2009.

- The industry cash contribution during this period has increased from $41.2 million to $87.5 million, while the contribution from government has increased from $97.5 million to $203.5 million.

The industry cash contribution only includes costs that are evidenced by an invoice, and does not cover the full economic costs incurred by industry. The word cash is therefore specifically used here as it excludes 'in kind' costs. In the case of industry training 'in kind' costs can include downtime on-the-job doing training, release time wages, and/or the costs of replacement staff for staff who are attending off-site training, as well as accommodation and travel where relevant.

- In regards to their contribution to industry training, 'in kind' costs are considered to be subjective and expensive to measure and record. To counter this, several ITOs have undertaken research on the costs and benefits of industry training.

- These research studies found there are distinct phases in which a trainee begins to contribute to a business. This contribution can be financial and non-financial, and some ITOs have measured changes in productivity due to industry training. [1]

The average cost per trainee covered by the industry cash contribution and government funding depends on the measure of trainee numbers used.

- The industry cash contribution can be measured by annual ITO trainee throughput. Here, the industry cash contribution is between $400 and $480 per trainee per year, while government funding is $1,120 to $1,150 per trainee per year. The annual total cash cost per trainee is therefore between $1,550 and $1,600.

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[1] See for example, NZIER. Making the most of a HITO apprenticeship. Wellington: 2010; NZIER. Return on investment from MITO apprenticeship training in New Zealand. Wellington: 2009; ASL. Identifying and Reporting the Value-Added From Training: Horticulture Sector. Palmerston North: 2010; ASL. Identifying and Reporting the Value-Added From Training: Extractives Sector. Palmerston North: 2010; ASL. Identifying and Reporting the Value-Added From Training: Services Sector. Palmerston North: 2010; AgITO. Reporting the Value-Added by Agricultural Training. Wellington: 2007;

- The industry cash contribution can also be measured using an annual snapshot of the number of trainees on training agreements as at 31 December. This increases the industry cash contribution to between $500 to $700 per trainee per year, and government funding to $1,460 to $1,600 per year. Here the annual total cash cost per trainee is between $2,000 and $2,300.

Skills training has externality benefits to the national economy. As such, the Government funds industry training through the cash contribution mentioned above, and provides a sound regulatory framework for training, qualifications and standards.

At an industry level the main costs in regards to industry training arise from supporting an industry's ITO through a cash contribution, contributing to various industry training advisory groups, and being available to provide input into the relevance and need for standards and qualifications. As mentioned earlier there are also 'in kind' costs; however, these are usually estimated through staff wages and replacement of staff costs.

At a business level, it is difficult to quantify the time of supervisors and business owners acting as mentors, on-the-job tutors, or assessors. It is also difficult to quantify the interruption to productive time within businesses caused by other staff working with trainees. Despite the difficulties in calculating these costs, the allocation of who bears these costs is fairly straightforward – they are borne by the employer or employees.

In many industries employees pay their training courses directly. In addition, all trainees are expected to contribute their own time and enthusiasm to learning the skills needed for their vocation.

1.1.2 Industry training benefits

At a macroeconomic level, the provision of industry training contributes to economic growth by increasing the volume of trade, and promoting innovation through the dissemination of research and technology.

- Industry training, and the recognised national qualifications that are delivered, enable the efficient operation of the labour market. This is beneficial to employers, industry and the national economy, and provides opportunities to individual employees.

Employers are influenced to engage and invest in industry training due to the productivity improvements gained by their employees, and their business, through training.

- Industry training helps businesses to reduce costs, and increase the quality of goods they produce and services they provide. Industry training can also allow businesses to

develop new markets for existing goods and services, as well as create new goods and services as employees increase their skills and competencies.

Individuals are motivated to enter industry training by its relevance, particularly the attainment of a national qualification.

- The opportunity to have a career, earn a wage while learning, and complete a nationally recognised qualification motivates many people to undertake industry training. In addition, people that enter industry training are aware that their nationally recognised qualification is often recognised overseas, which means they can take their skills, knowledge and competencies anywhere in the world. National qualifications provide industry recognition that the role people are in is a career with a career pathway.

The operation of industry training, and the recognition of skills, knowledge and experience through qualifications, allows, facilitates, and encourages employees to embark on a career path. Career pathways, and the recognised careers that signpost these pathways, provide employees with benefits such as increased work satisfaction and higher earning potential.

1.1.3 Industry training costs

At an employer and employee level, industry training cost calculations are complex. This is due to the different delivery methods of industry training. To simplify the cost calculations, we have classified training into two main types - Role Productivity, and Occupation and Trades.

- Role Productivity training is training in specific skills to increase productivity in specific roles within a particular business. These skills may be transferable to other businesses or countries, but not necessarily to other industries.

- Occupation and Trades training is training in a range of skills and experiences particular to an occupation or trade. These skills are transferable to other businesses, and to a large extent, to similar roles in other industries.

Under Role Productivity training, the impact on the business of improved productivity due to employees undertaking training are significant and immediate.

- Role Productivity training costs, including the industry and government cash contributions and industry 'in kind' costs, are in the range of $2,452 to $8,400.

- Role Productivity training is done by internal staff, and at times of the year when there is low demand on their time for production. The economic cost of training in these occupations and within these sectors is therefore low.

- In Role Productivity training the benefits of training one person, such as a leading hand, can positively influence the productivity of a group of workers.

- There are significant benefits to employers from this type of training and subsequently most employers cover the costs of this type of industry training as they receive a direct benefit from this investment.

Also, as we discussed earlier, the skills gained may not be directly transferable to another industry but can be transferred to another business. In Role Productivity training therefore, the employee does not bear the costs of training and are not required to forego large amounts of their own time. The benefits to employees from Role Productivity training come in the form of an increase in income, due to being more productive as a consequence of training, and greater job satisfaction.

Under Occupation and Trades training, it takes a period of up to two years before the trainee makes a significant contribution to the output of the employing business.

- The economic cost of training in Occupations and Trades training is high, and is in the order of magnitude of $75,000.

- Occupation and Trades training requires external study and tuition, and may include the 'in kind' costs of staff wages and replacement labour, mentoring, on-the-job training, and study time. .

- In the first two to three years, the costs of training are estimated to be $15,000 per trainee per year. During this period, the benefits per trainee per year are estimated to be $16,400. Employers argue that trainees in these types of occupations contribute little to the overheads and profit of the business in the early years of their trades training, which is supported by the previous calculations.

- However, once the employee is trained, their hourly rate increases, and the margin the business can charge on their work increases. For example, by year six of their employment the employee can contribute around $57,000 to the overheads and profits of the business. Over the first eight years, therefore, the accumulated gross margin is estimated at about $330,000 per trainee.

- Given that the accumulated training cost over the same period was estimated at $75,000 per trainee, this indicates that if a trainee stays for at least eight years then the business will receive some return for the training and experience given to the trained employee.

Here, the skills gained as part of Occupation and Trades training are a major benefit to the employee. Their earnings potential increases and they acquire a set of skills that ensures they have a lifetime occupation. In recognition of the benefits they gain, employees often cover the cash contribution and 'in kind' costs of training.

Employers also generally cover the 'in kind' contribution of the trainees' time while on block courses, and the replacement labour cost. They do this because the benefits from Occupation and Trades training accrue to the employer in the long-run, as the trained employee contributes towards the overheads and profits of the business.

1.1.4 Benefit cost ratios

As mentioned earlier, several ITOs have undertaken research on the costs and benefits of training in their industries. This research identified a high level of benefit to individual businesses for each $1.00 spent on training. These benefits also flowed through to the industry as a whole, especially where training lifted the quality of the goods and services produced.

However, the ongoing annual benefits from industry training were not specifically clarified in these Benefit Cost Ratios (BCRs) studies. To add to this analysis, we have therefore analysed the Net Present Value of income streams, using an example of the lifetime benefit to an employee who undertakes Occupation and Trades training, and the benefit to national GDP of this investment. This form of estimate is another means of indicating the financial value of industry training.

- Our assumption in this calculation is that a person's working life is 50 years. And a six percent discount rate is used to give the present value of future incomes.

- Industry information used in our training model of the costs and benefits for Occupation and Trades training indicates that the initial level of annual income for occupations in this classification is $26,000 and that after four years of employment and training this could rise to $35,400, and by 10 years, $62,400. This income level could continue for the remainder of the employee's 50 year working life.

Using these assumptions the present values of the 50 years of income flows are:

- Employee without trades training: $522,000
- Employee a trained, experienced tradesperson: $841,000

This estimate of the present value of relative lifetime incomes is a simple form of analysis of the value of human capital for each career path. However, the employee does not receive all of the income benefit, as the Government receives income tax from this.

- Both take-home-pay and income tax contributes to New Zealand's GDP. Therefore these estimates are a good indication of the relative contribution to national GDP of people engaging in industry training.

- The impact on GDP of people engaging and investing in industry training can also be highlighted at a macro level using the BERL computable general equilibrium (CGE) model. The CGE model is used here to explore various industry training scenarios.

- The model measures a range of economic indicators including employment, output (or production, or sales), and exports by 53 industries, as well as employment by 40 occupations, GDP, and exports at the macro aggregate level, and the trade balance and government balance.

1.1.5 CGE modelling

The modelling of scenarios highlights that the returns to the New Zealand economy of an additional skilled person are high. These returns are observed in the differences between the scenarios and the business as usual projection for the New Zealand economy. These differences illustrate the impact on economic indicators, such as employment and output, of assumed changes in industry training investment.

The scenarios focus on a decrease or increase in public and private investment in industry training. Short and long-term impacts are explored by the model experiments, with the change in industry training assumed to be imposed in 2012. The effect on the economy for 2014 is considered the short-term impact, while the longer-term impact is for the 2021 year.

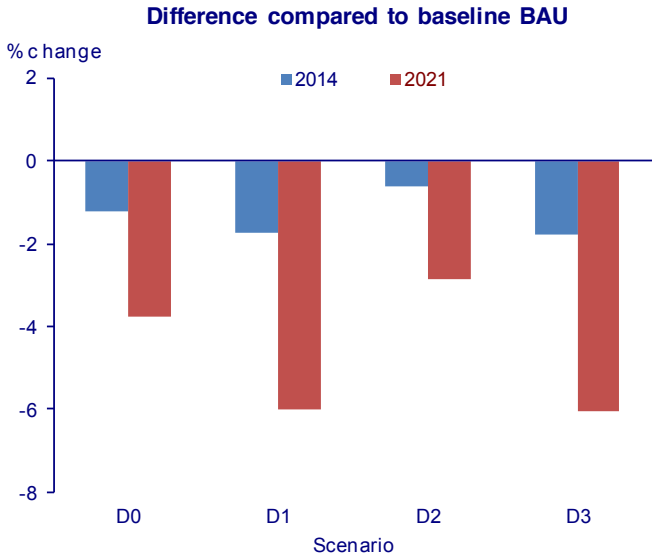
The modelling results indicate that:

- A loss of all public funding of industry training results in a short-term loss in Gross Domestic Product (GDP) of between 0.6 and 1.8 percent, compared to the level of GDP reached in the baseline business as usual (BAU) situation. Over the longer term, this loss in GDP rises to between 2.9 and 6 percent.

- In constant 2010$ terms, the short-term loss in GDP equates to between $1.2 and $3.7 billion annually. Over the longer term, these losses rise to between $7.2 and $15.1 billion.

- The loss in GDP in the short and long-term is heavily dominated by the impact on the export sector. In the short-term, the loss in total export volumes ranges from 1.3 to 5.3 percent compared to the baseline BAU level of exports. In the long-term, total export volume losses rise to between 8 and 19 percent.

Figure 1 Impact on GDP, decrease in industry training scenarios



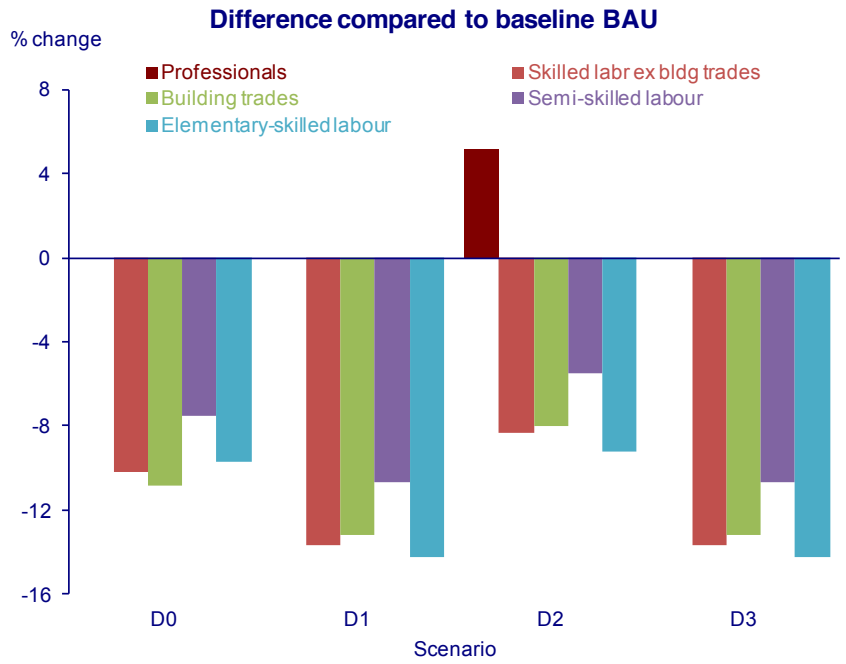
The long-term loss in GDP and subsequent impact on the export sector impacts on employment. This is because a reduction in the availability of skill, trained labour due to a decrease in investment in industry training impacts on the capacity of businesses and industry to produce outputs or deliver services. Over the longer term this also results in a relative increase in the cost of skilled, trained labour as industries compete for the reduced pool of talent.

This increase in the cost of skilled, trained labour impacts on the competitiveness of the New Zealand export sector. Consequently, the reduced cost-competitiveness of the export sector is directly translated into a reduction in export sales, as New Zealand producers lose out to other suppliers in the global market place.

At an industry level, the modelling results indicate that employment in the primary and manufacturing industries are the hardest hit by a decrease in investment in industry training. At an occupation level, the decrease in investment in industry training is wider spread and has a negative impact over the short and long-term.

Figure 2 illustrates this impact in 2021 compared to the baseline business as usual scenario. Here, occupations are grouped into five key areas: professionals, building trades, elementary skilled labour, skilled labour excluding the building trades, and semi-skilled labour.

Figure 2 Impact by occupation, decrease in industry training scenarios, 2021



- Occupations in the professionals grouping remain unchanged, in line with a decrease in industry training affecting non-professional occupations.

- The semi-skilled labour grouping includes office, clerical and customer service roles. While negatively impacted by the decrease in investment in industry training, these categories currently comprise relatively less of the national industry training effort, so are less affected.

- Employment in the building trades, skilled labour excluding building trades and elementary skilled labour occupations decreases. This is unsurprising as the annual number of qualification completions declines with a decline in investment in industry training, and therefore the number of skilled, trained people in these occupations declines.

- Large employment losses in the elementary skilled labour occupations are partly due to the training requirements of people in these occupations becoming more critical as new production techniques are developed.

Overall, the model results reaffirm that the New Zealand economy needs all skills, and that there is social and economic justification to support training for all skill provision – vocational,

trades, academic and professional. These results are further reinforced in the scenarios where investment in industry training by the public and/or private sector increases. Under these scenarios, the modelled results show that focussing on particular industries, such as the export sector, or aligning to particular government policy, such as the Tertiary Education Strategy, has limited additional gain over investment in a broad training effort.

The modelling results under these scenarios indicate that an increase in public sector investment in industry training results in a long-term gain in GDP of between 0.5 and 0.7 percent, compared to the level of GDP reached in the baseline business as usual situation.

These relatively small gains (when compared to the magnitude of the losses discussed above) arise primarily from an overall labour supply constraint. The scenarios assume no change in population, labour force participation or migration. Consequently, as industry training increases the available pool of skill, trained labour the New Zealand economy approaches a full employment situation.

1.1.6 The rationale for public investment in industry training

The New Zealand economy is relatively constrained in terms of the amount of capital it has available. This means the skill levels of employed people will positively impact on the quality and value of the goods and services produced, and the standard of living in New Zealand. As our previous cost benefit analysis and CGE modelling experiments have illustrated, industry training contributes to the development of these skills. However, the market for industry training exhibits imperfections, in particular relating to information asymmetry. This provides a strong rationale for public sector investment in industry training.

Subsequently, a focus on short-term return on investment or direct value for money is not appropriate as it does not acknowledge this market failure. If the market mechanism fails, and resources are not efficiently allocated, then in the case of industry training the skills demanded by the labour market and the economy will not be matched by the supply of new entrants.

ITOs rectify this potential for market failure by minimising the impact of information asymmetry. They do this through the development of national qualifications and the standards required to achieve these qualifications; through the arrangement of industry training in a classroom, in a workplace, or in a combination of these locations; and through their leadership on skill and training matters, particularly in regards to identifying current and future skill needs, and their work with employees, employers and industry to meet these needs.

ITOs also reduce transaction costs through arranging the delivering of industry training, and through their development of national qualifications that meet industry standards and labour market needs. A reduction in variety, through the development of national qualifications, can lower costs as employers and employees know what to expect from industry training and the quality of the output. Gaining a nationally recognised qualification may decrease frictional unemployment and lower costs as employees spent less time explaining what their skills, training and qualifications are to prospective employers, and employers are able to successfully recruit skilled, trained staff.

Observations made through the use of the BERL computable general equilibrium model have highlighted the significant contribution that industry training makes to the New Zealand economy; but, they have also illustrated that an economy is a complex system. Any attempts to prioritise or isolate particular industries, sectors, occupations or skills as being more or less important are economically unsound.