Attachment A

A note on the Productivity Commission's modelling of COAG VET reforms

This note was prepared for TAFE Directors Australia

24 February 2012

Independent Economics is an independent provider of economic modelling services to support economic policy analysis and forecasting. We are strongly committed to independent modelling that provides robust analysis and real solutions to meet client needs. In Australia, we provide services to government and industry, and we also provide services internationally.

Postal Address:

Independent Economics
PO Box 4129
KINGSTON ACT 2604
AUSTRALIA

Street Address:

Independent Economics
Unit 4
4 Kennedy Street
KINGSTON ACT 2604
AUSTRALIA

Phone: +61 2 6295 8884

Email: office@independenteconomics.com.au

Web-site: www.independenteconomics.com.au

Entity: Econtech Pty Ltd (ACN 056 645 197) trading as Independent Economics

Introduction

The Australian Government asked the Productivity Commission (the Commission) to report on the economic impacts and benefits of COAG's VET reform agenda. The majority of these reforms involve a boost to the amount of government funding for VET and hence an expansion in the number of individuals undertaking a VET course.

Under our terms of reference, Independent Economics was commissioned by TAFE Directors Australia (TDA) to prepare a short note commenting on the Commission's modelling. Independent Economics is not responsible for any use of this note by any other person or for any other purpose.

The Commission estimated the economy-wide impact of expanding the VET sector in three steps.

1. It estimates the number of additional qualifications completed as a result of the policy.

2. It estimates the effects of these additional qualification completions on labour market participation, productivity, perceived private benefits and net social benefits are estimated.

3. The direct benefits from the second step are used to simulate the effects on the economy using an economy-wide model. Specifically, the economy-wide benefits of the boost to participation and productivity, as a result of an expansion of the VET sector, are simulated using a Computable General Equilibrium (CGE) model.

In practice, the first two steps are of more importance in estimating the overall economic impacts than the third step. As the Commission acknowledges, the estimates obtain in the second step of the direct gains in labour force participation and labour productivity could have been used to estimate the GDP gains in a back-of-the-envelope calculation. This produces a similar estimate of the GDP gain to the CGE modelling of the third step:

> *…approximately 90 per cent of the aggregate, economy-wide impact of the COAG VET reforms can be explained by the direct effects. (p. 184)*

The main value of the CGE modelling for the Commission's report is the picture it provides of the industry pattern of the economic gains, rather than of the total amount.

Hence, the focus here is on the second step of estimating the direct economic benefits of COAG's VET reforms. The direct economic benefits of investment in education, including COAG's VET reforms, take three main forms:

i. higher labour force participation;

ii. higher labour productivity; and

iii. a better matching of the skills of workers to the available jobs.

The Commission's estimates of the economic gains through these three channels are now discussed in turn. As noted throughout the Commission's report, there are also social benefits to education, but these were not modelled.

(i) Appropriate measure of labour force participation gain

In general, people with higher levels of educational attainment participate more highly in work. This can occur through higher rates of participation in the labour force, lower rates of unemployment for those in the labour force, and higher average working hours for those in employment. The Commission captures all of these effects by focussing on the additional total hours that are worked as a result of higher levels of educational attainment under COAG's VET reforms.

On a point of terminology, the labour force participation rate published by the ABS is a narrower concept, which refers to rates of participation in the labour force. However, from an economic perspective, the wider concept used by the Commission is the appropriate measure for capturing benefits of higher levels of educational attainment. To avoid any confusion, the Commission's measure would perhaps be better referred to as participation in work rather than labour force participation.

(ii) Underestimate of productivity gain

People with higher levels of educational attainment are generally more productive. While these productivity gains may be difficult to measure directly, the Commission follows standard practice by using average hourly wages as a proxy for productivity.

Hence, it estimates the productivity gains from higher levels of educational attainment from the associated wage premiums. These premiums are separately estimated for young learners (aged 15-24) and mature learners (aged 25-64).

It is generally recognised that wage premiums for higher levels of educational attainment are likely to over-state the actual productivity benefits that would be achieved by policies that increase the numbers of people with higher levels of education. This is because existing wage premiums show the average benefit of a higher level of education, whereas the marginal benefit from adding to the number of people with a higher level of education could be less, if those additional people are less able.

Hence, there is a case for discounting the existing wage premiums to correct for ability bias (also known as skills and attributes bias). Correcting for such a bias is particularly important when the policy involves a significant expansion in the size of the VET sector. This is because the marginal benefit from expanding the sector diminishes with the size of the expansion as individuals with skills and attributes that are less suited to undertaking VET enter the sector. This diminishing marginal benefit effect is also a feature of expanding other education sectors, such as the higher education sector.

The Commission allows for ability bias. It does this by assuming that an individual who completes a VET qualification as a result of a COAG initiative obtains a productivity benefit that is much less than the average wage gap between the VET-qualified and school-qualified populations. It assumes that the new VET graduates from the initiative are at the lower end of the productivity scale for the VET-qualified population, and otherwise would have been at the upper end of the productivity scale for the school-qualified population. The Commission applies this discount for both young learners and mature learners.

For mature learners, without apparent adequate justification, the Commission also applies an additional discount of 24 per cent, again on the grounds of skills and attributes bias. The two discounts taken together lead to a high effective discount rate for wage premiums and hence an underestimate of the productivity

boost from higher education attainment for mature learners. This is significant because mature learners account for 55 per cent of all learners.

The effect of these two adjustments on wage premiums for mature age learners and the effective discount rate applied is shown in the table below. The premiums are expressed relative to an individual whose highest education qualification is Year 12 or lower. For example, without any adjustments, a person whose highest qualification is a Diploma earns 33.3 per cent more than a person whose highest educational attainment is Year 12 or lower. After applying the 24 per cent ability discount, this premium drops to 25.3 per cent. But with both the 24 per cent discount and the further discount for ability, the premium drops to 15.1 per cent. That is, after the two adjustments, a person whose highest qualification is a Diploma earns 15.1 per cent more than a person whose highest educational attainment is Year 12 or lower. This implies a very high effective discount of 54.7 per cent on the unadjusted wage premium of 33.3 per cent for a Diploma qualification.

Wage premiums and effective discount on wage premiums (per cent)

	Unadjusted	24% ability discount	Further ability and qualification discount	Effective discount
Degree	67.5	51.3	28.2	58.3
Diploma	33.3	25.3	15.1	54.7
Cert. III/IV	10.0	7.6	0.8	92.1

The Commission's effective discounts of productivity gains for mature learners are high compared to other Australian studies. Leigh (2008) uses a discount of 10 per cent on wage premiums to adjust for the skills and attributes bias when estimating the returns to education. Universities Australia (2010) uses Leigh's estimates of wage premiums to model the productivity gains from higher expenditure on tertiary funding, but uses a deeper discount of 20 per cent. A study by Leigh and Ryan (2008) estimated an ability bias of between 9 per cent and 39 per cent in Australia. This study seems to be the original source of the Commission's discount of 24 per cent (i.e. the mid-point between 9 per cent and 39 per cent).

The main issue is that, in the case of mature learners, the Commission has discounted the productive gain twice rather than once, resulting in effective discounts that are much higher than those used by other researchers.

(iii) Does not allow for improvements in labour market flexibility through skill matching

A key role of the VET sector is in developing a labour force with skills that match those in demand by industry. This was recognised in a Skills Australia's report on the VET sector, Skills for Prosperity.

> *Vocational education and training will also be expected to equip the workers of the future with the capability to adapt continuously and engage in learning throughout their working lives as they respond to changes in technology and the demands of climate change and globalisation. (p. 110)*

By equipping people with the skills that are in most demand, improved skill matching provides economic benefits by both boosting participation in work and supporting higher wages. It does not necessarily involve

obtaining a higher level of educational attainment. Rather, it may involve a sideways shift into a different field of study that is in strong demand.

In contrast, the Commission assumes that:

> *…an individual's workforce participation and his or her productivity, are only enhanced through the attainment of a full qualification above the level of the highest one already held. (p. xxii)*

Hence, under the Commission's framework, individuals studying at the same level of qualification or below one already held as a result of VET reforms receive no participation or productivity benefit. This assumption captures the benefits from VET's role in up-skilling individuals but ignores the benefits flowing from VET's role in re-skilling individuals to reduce jobs mismatch. Completing a qualification in high demand, even when the qualification is at the same level or below one already held, may assist in improving an individual's employability. This improvement in employability may boost an individual's participation in work, and may also mean that they can command a higher wage.

Re-skilling individuals in qualifications that matches the skills currently in demand improves overall labour market flexibility. Importantly, some of the VET reforms analysed, such as the NPAPPP, tie funding directly to areas of current or emerging skills needs. The Commission's modelling does not take this important dimension of economic benefit into account.

Other studies have focussed on the role of education in improving labour market flexibility. Economic modelling was completed for Skills Australia to analyse the gaps between demand and supply of skills and qualifications at industry, occupation and broad qualification level and VET's role in closing these gaps. This type of economic modelling relies on a greater disaggregation of qualifications (tertiary qualifications are broken down into fields of study) and occupations, so that there is finer detail in the matching between qualifications and occupations. In addition, the modelling relies on the identification of skills shortages and hence requires a modelling framework which captures shortages. These two modelling features are not incorporated into the current modelling framework used by the Commission.

Conclusion on economic impacts

The Commission's modelling only partially captures the economic benefits of COAG's VET reforms. In terms of the three channels through which economic benefits are likely to flow:

i. the Commission appropriately captures the gain in participation in work;

ii. excessively discounts the productivity gains for mature learners by double discounting; and

iii. completely omits the gains in employability from developing a labour force with skills that better match those in demand by industry.

Report outlines the potential case for government intervention in the VET sector, but this is not reflected in the actual modelling

The Commission provides a sound discussion of the potential market failures or government intervention in other markets, which justify government intervention in the VET sector in section 2. One potential cause of

market failure in the VET sector identified by the Commission is incomplete information. This is the case when there is not enough information available for potential entrants to the VET sector to make an optimal education-work decision. As noted by the Commission, lack of information is one driver of myopic behaviour of individuals with regard to the education-work decision because the long-term benefits of education are uncertain, while the costs are borne upfront (p. 15). That is, individuals place too much value on short term costs and benefits compared to long term costs and benefits.

However, this case for government intervention in VET is not reflected in the draft modelling. Specifically, in the Education and Labour Market Outcome (ELMO) model used by the Commission, perceived private benefit is one input into an individual's education-work decision. Perceived private benefit is calculated as follows by the Commission:

> *perceived private net benefit = private benefit – private cost + residual + overestimate (p. 73)*

The overestimate term is designed to

> *…allow for the possibility that people might overestimate or underestimate the net benefit with different education-work options. For example, people from disadvantaged backgrounds might underestimate the benefits from a university degree (chapter 2). (p. 74)*

This overestimate term is set to zero by the Commission in the draft modelling (p. 80). This means that the modelling takes no account of the argument in the body of the report that individuals may be too myopic when deciding on their level of educational attainment. The Commission defends this by stating that the issue of whether or not individuals appropriately perceive benefits from education will be addressed in the final report. However, this means that stakeholders are not able to comment on the Commission's final estimate of a fundamental input to the modelling. That is, if this term is not set to be an underestimate (consistent with myopic behaviour of individuals) the modelling would not fully capture the case for government intervention in VET.

Notably, the commission also allows for a separate term to capture the external benefit of education, but this term has also been set to zero (p. 80). This term is used in to capture the benefits accruing to third parties from an individual's education attainment as opposed to the benefits accruing solely to the individual undertaking education. In other words, it is used to capture the positive externalities or public benefits of education and as noted by the Commission, is one argument for government intervention in VET.

Hence while the body of the report acknowledges two key arguments for Government support of the VET sector, and both of these effects are allowed for in the modelling structure, they have both been set to zero in the draft report without adequate justification.

Conclusion of the report is not clear

The Commission recognises that in assessing the efficacy VET reforms, the basis should be its impact on net social benefit as this captures all factors affecting an individual's wellbeing. Net social benefit in the Commission's modelling is defined as:

> *net social benefit = gross payments to labour – money cost of education – value of non-market activity foregone by working + adjustment to capture the value of government revenue + external benefits + residual (p. 76)*

As discussed earlier, the benefits to VET accrue in the long term while the costs are borne upfront. Thus, the Commission has discounted the costs and benefits to arrive at a net social benefit estimate in present value terms. However, the Commission has not published the discount rate used to calculate the present value of net social benefits as a result of VET reforms. Hence, an overall assessment of the VET reforms cannot be made from the report. For example, a discount rate that is too high would not reflect the true opportunity cost of funds invested in VET reforms and thus the present value of net social benefits from the reform would be an under-estimate of its true impact on wellbeing. The discount rate is another fundamental input into the modelling and by not publishing its value in the draft report, the Commission is not providing an opportunity for stakeholders to comment on its appropriateness.

Given that governments have limited funds and competing priorities, a better assessment of the effectiveness of VET reforms can be provided by estimating an internal rate of return (IRR) for government funds allocated to reform. This is because a ranking of policy initiatives according to the IRRs would enable government to allocate funds to those reforms and initiatives which have the highest rate of return. That is, governments can compare the IRR from investing in VET reforms with the return from other policy initiatives to determine whether investing in VET is the most efficient use of government funds.

Clarity in definition and application of adjustment to capture the value of government revenue

In the equation above for net social benefit, the definition and application of the adjustment to capture the value of government revenue is unclear and greater clarity is needed.

As noted by the Commission, tax receipts and transfer payments between the government and the private sector should not be incorporated into the cost-benefit analysis used to assess the impact of VET reforms as they are merely transfers between different sectors of the economy without aggregate benefits or resource costs (p.21). However, raising taxes to fund government expenditure can blunt economic incentives to work, save and invest, resulting in so-called deadweight losses to the economy. This deadweight loss should be subtracted in the calculation of net social benefit from COAG's VET reforms.

Indeed, this appears to be how the term is calculated and applied when estimating the net social benefit of VET reform for young learners.

> *The value of tax revenue is assumed to be $1.24 per dollar of tax revenue (appendix C). (Footnote 4, p. 90)*

Hence, Appendix C states that the Commission uses a deadweight loss estimate of 0.24 cents per dollar of tax revenue.

However, when estimating the net social benefit of VET reform for mature learners, the adjustment term is defined rather differently as:

> *The change in the value of government revenue (the benefit that people gain from government expenditure). (p. 121)*

In subsequent calculations of net social benefit for mature learners in Appendix E, this term is added instead of subtracted.

Thus, the section of the report for mature learners appears to have mistakenly added, rather than subtracted, the deadweight loss from raising tax revenue for funding COAG's VET reforms.

References

Leigh, A. (2008) "Returns to Education in Australia", Economic Papers, vol. 27 no. 3.

Leigh, A. and C. Ryan (2008) "Estimating Returns to Education Using Different Natural Experiment Techniques", Economics of Education Review, 27, 149-160.

Universities Australia (2010), "Economic modelling of Improved Funding and Reform Arrangements for Universities", http://www.universitiesaustralia.edu.au/page/270/submissions---reports/commissioned-studies/economic-modelling/ (accessed 22 February 2012)