A Critique of

'Assessing Direct Government Subsidies Paid to Tasmanian Industries'

(A Report by BS Felmingham, S Poate and I McMahon [IMC-Link], May 2009.

for Forestry Tasmania and the Forest Industries Association of Tasmania)

by

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It has been claimed that this *Report* 'clearly shows subsidies benefits consumers as well as producers, and generate jobs and income for Tasmanians'[1].

It does nothing of the kind.

The *Report* attempts to estimate value added for five Tasmanian industries, to estimate subsidies paid in each of the industries, and to take the ratio of the two. This referred to as the 'bang for buck' ratio. The higher is the 'bang for buck', according to the *Report*, the greater the 'return' per dollar of subsidy.

An example illustrates why this approach is completely uninformative as to Dr Drielsma's claim.

Suppose, counterfactually, agriculture initially receives no subsidies at all. The government then subsidises apple growing on the marginal electorate of Macquarie Island, with a $10m grant. Farmers take the opportunity to spend a year or two working among the scenery and birdlife down south. Value added in Tasmanian agriculture (roughly speaking, the amount of productive activity in agriculture) falls.

Clearly this subsidy would fail any sensible cost-benefit test but, on the *Report*'s methodology, the industry would show a high 'bang for buck' ratio because the subsidy is small relative to the size of the agriculture sector.

The 'bang for buck' ratio has nothing to say about benefits to consumers, producers, incomes or jobs.

Even so, the *Report* might have made a contribution to debate if it generated plausible estimates of subsidies and value added in each of the five industries.

I argue that the *Report* fails on this score, too.

[1] H.Drielsma, quoted in Forestry Tasmania media release, 14 June 2009.

Key Points.

1. The objective of the *Report*, 'to match the costs of particular subsidies against their actual contributions[2]', is worthwhile. A rigorous evaluation of the effectiveness of industry assistance to Tasmanian industries is a substantial task and would be an important initial contribution to policy and public debate. The *Report* is so replete with errors that it makes no worthwhile contribution.

2. The *Report* attempts to meet its objective by first calculating the so-called Subsidy Intensity Index – subsidy per unit of value added. It was hardly necessary to introduce a new name for this ratio. Using terminology that goes back to the 1960s in Australia, the ratio is usually called the nominal rate of assistance. The *Report* then takes the inverse of the nominal rate of assistance, calls it the bang for buck ratio and argues that the higher the ratio, the 'more effective a subsidy paid to the sector.'[3] Even if the numerator (value added) and the denominator (subsidies) were correctly measured the bang for buck ratio is uninformative as to whether a subsidy is justified or indeed whether the subsidy has had *any* effect on value added in the sector. Cost-benefit analysis is required to evaluate whether subsidies are justified.

3. The sectors are not defined in a consistent way. Downstream processing is included for Forestry but not for Agriculture and Fishing, for example.

4. The numerator of the bang for buck ratio is incorrectly measured. The *Report* is based on fundamental misconceptions regarding the measurement of value added, making the sectoral value-added estimates meaningless.

5. Subsidies included in the denominator of the bang for buck ratio are restricted to direct cash payments. Restricting the definition of subsidies in this way is misleading and involves particularly important omissions in the 'Forestry and timber processing' sector and, most likely, for the 'Mining and minerals processing' sector.

6. Various claims made in media releases by the Forestry Industry Association of Tasmania and by Forestry Tasmania, based on this *Report*, are not justified.

[2] *Report*, p.8.
[3] *Report*, p.3.

1. The objective of the Report, 'to match the costs of particular subsidies against their actual contributions[4]', is worthwhile. A rigorous evaluation of the effectiveness of industry assistance to Tasmanian industries is a substantial task and would be an important initial contribution to policy and public debate. The Report is so replete with errors that it makes no worthwhile contribution.

In my recent report on support for Tasmania Forestry, I argued that[5]

'If one were to provide a comprehensive picture of the impact of assistance to the Tasmanian forestry industry an analysis .... comparing rates of assistance to all industries for Tasmania, would be a good way to start.'

I support the stated objective of this *Report*. My analysis made no claim that all subsidies are bad, or that inefficient subsidies and bad industry-policy decisions are confined to the forest industry. In tourism, for example, the Spirit of Tasmania III decision, or the granting of the exclusive poker machine license to Federal Hotels are important examples that deserve detailed analysis. In agriculture, any decision to pipe irrigation water to all parts of the State cries out for serious scrutiny before commitment of taxpayers' money.

A review of the form and level of assistance to the Forestry industry is, however, particularly pertinent because sections of the industry are facing difficulty even without the temporary effects of the current worldwide downturn. The following considerations suggest the need for structural change in the industry:

(i) The two old paper mills on the North West coast are under review following the sale of Australian Paper (owned by PaperlinX) to Nippon Paper Group. These mills use imported pulp, and so do not rely on Tasmanian wood supply. However their employment of 450 on-site workers is uncertain.

(ii) In 2007 the Tasmanian Forest Contractors Association asked the Commonwealth Government for $93m in addition to support provided under the Tasmanian Community Forests Agreement (TCFA) to facilitate structural adjustment and to assist businesses and employees to exit the industry[6].

(iii) Following the collapse of Timbercorp and Great Southern Plantations, the rate of expansion in forestry plantations established under Managed Investment Schemes is likely to slow, even if the MIS taxation concessions continue in their current form.

(iv) After the last payment of $27m in 2009-10, support by Tasmanian taxpayers under the TCFA will cease.

(v) If Gunns' pulp mill is built, stated policy is for the mill to rely wholly on plantation timber soon after commencement. The mill will not, of itself create many additional jobs in logging. Also, it is difficult to see any role for Forestry Tasmania's Long Term Pulpwood Supply Agreement. Since the agreement's price is indexed to the world price of pulp, it is unlikely that Gunns would want to purchase native forest eucalypt pulp wood under the terms of the agreement if it is not to be used for pulp manufacture.

Against this bleak outlook my report argued that, over the last 11 years, the Tasmanian Forestry industry has been supported by $632.8m (in 2007/08 prices) and that, since this support had 'failed to arrest the

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[4] *Report*, p.8.
[5] Wells Economic Analysis (2009), p.4.
[6] See Department of Agriculture, Fisheries and Forestry (2007) and Pöyry Forest Industry (2007).

decline in employment in the industry, it is important to ask whether continuation of assistance, at current levels and in the current form, is justified.'[7]

So what did I mean when I said that 'comparing rates of assistance to all industries for Tasmania would be a good way to start'?

As I explain in the next section, a comparison of rates of assistance should be based on *effective* rates, not *nominal* rates. The *Report* attempts to do the latter.

A rigorous comparison of effective rates of assistance would indicate which sectors get higher rates of effective assistance than others.

But that is only the first step. It doesn't necessarily indicate whether this assistance is worthwhile or not. Maybe it isn't. Maybe it is – not all subsidies are socially inefficient.

So the next step would be to ask, starting with industries that get a high rate of effective assistance, whether assistance is achieving its objective. For instance, one could ask, if the objective is to maintain jobs in an industry, whether a high rate of assistance has achieved that objective. One could also ask why, given that most people have to change employment many times in their working lives, it is necessary to maintain employment in a specific industry at the expense of other industries. And so on.

There is *no* simple 'single number' analysis such as a sectoral 'bang for buck ratio' that is informative as to whether specific forms of industry assistance are warranted.

2. The Report attempts to meet its objective by first calculating the so-called Subsidy Intensity Index – subsidy per unit of value added. It was hardly necessary to introduce a new name for this ratio. Using terminology that goes back to the 1960s in Australia, the ratio is usually called the nominal rate of assistance. The Report then takes the inverse of the nominal rate of assistance, calls it the bang for buck ratio and argues that the higher the ratio, the 'more effective a subsidy paid to the sector.'[8] Even if the numerator (value added) and the denominator (subsidies) were correctly measured the bang for buck ratio is uninformative as to whether a subsidy is justified or indeed whether the subsidy has had any effect on value added in the sector. Cost-benefit analysis is required to evaluate whether subsidies are justified.

The measurement of relative rates of assistance across industries and sectors has a long history in Australia. While he was at ANU in the early 1960s Max Corden made an important point in distinguishing between the nominal rate of assistance (essentially the same concept as the *Report*'s Subsidy Intensity Index) and the effective rate of assistance[9]. He showed that when assistance given to one sector changes input costs for downstream sectors, these indirect effects can be significant in changing the effective rate of assistance there.

For example, if the Energy sector is subsidised, input costs for other sectors – Mineral Processing, for example – are lowered, leading to an increase in the effective rate of assistance there.

Corden showed that these indirect effects were highly significant in Australia, with the result that hardly anyone calculates nominal rates of assistance any more. In that sense the *Report* is 'groundbreaking'. In a single leap the *Report* has taken analysis backwards by 40 years. Nowadays agencies such as the

[7] Wells Economic Analysis (2009), p.4.
[8] *Report*, p.3.
[9] For Corden's personal account of the development of these ideas, see Corden (undated).

Productivity Commission calculate the *effective* rate of assistance, a measure which takes separate account of the effects of assistance on both sector inputs and sector outputs.

Now turn to the 'next step' I highlighted in section 1. In discussing various single-number indicators such as the nominal or effective rate of assistance, the Productivity Commission's caveats against the use of single-number measures of assistance are worth repeating in full:[10]

- the [Productivity Commission's] estimates do not cover all government measures that may assist industries
- the measurement methodology uses a 'static' framework, so the estimates do not take account of the responses of producers and consumers to the incentives created by the provision of assistance
- rates of assistance reported at the sectoral or industry level may hide variations in assistance to industries and/or firms, respectively, within those categories
- while measures such as the net subsidy equivalent provide an indication of the transfers of income to producers from consumers, taxpayers and intermediate suppliers, they do not indicate the 'welfare' costs to the community of assistance
- while the measures quantify the assistance provided by various instruments, they do not indicate how much, if any, of that assistance is unjustified. This turns on considerations such as the prevalence of any market failure that the instrument may address, and the design and cost-effectiveness of the instrument.

Most of these dot points apply directly to my example of subsidising apple-growing on Macquarie Island. They apply with equal force to the subsidies included in, and to the large number of subsidies which were omitted from, the *Report*.

3. The sectors are not defined in a consistent way. Downstream processing is included for Forestry but not for Agriculture and Fishing, for example.

Any sectoral analysis it more useful if sectors are defined in a consistent way. The *Report* does not do this. For example, in two sectors – Forestry and Forestry Processing, and Minerals and Minerals Processing, downstream processing of the raw material is included. This practice is not followed in Agriculture and Fishing. It is difficult see how the relationship between upstream and downstream processing in agriculture (a farm and an abattoir, for example) is conceptually different to, say, the relationship between a mine and a smelter, or a logger and a woodchipper.

The *Report* provides no justification for this differential treatment, but the effect is to increase the size of Forestry and Timber and Minerals and Mining relative to other sectors.

[10] Productivity Commission (2007), p.15.

4. The Report is based on fundamental misconceptions regarding the measurement of value added, making the sectoral value-added estimates meaningless.

In deriving value added in the five sectors, the *Report* must overcome the problem that the sectoral classification used in the *Report* does not correspond to that used by the ABS. This is a common problem in industry analysis, and it is not one that is easily overcome[11].

This reclassification has already been achieved in the Tasmanian tourism industry, and results are publicly available[12]. Since these estimates appear to be reliable, they are not discussed further. Table 1 illustrates reclassifications in the remaining four sectors.

Table 1 Comparison of Tasmanian value added in ABS and *Report* sectors

ABS Sector		*Report Sector*	
Agriculture + Fishing + Forestry	4.61%	Agriculture + Fishing	6.36%
		Forestry + Forestry Processing	7.53%
Mining	2.62%	Mining + Minerals Processing	10.12%
Manufacturing	14.23%		
Electricity + Gas + Water	4.08%	Electricity + Gas	4.91%

Source: Appendix 1 and *Report*, Table 3.3. Data are for 2007.

Three reclassifications are involved:

1. Forestry is removed from the ABS sector, and, together with part of the ABS Manufacturing sector, comprises a new sector in the *Report*, Forestry and Forestry Processing.
2. The ABS Mining sector is combined with part of the ABS Manufacturing sector to generate a new sector in the *Report* which, to facilitate comparison, I have labelled Mining and Minerals Processing.
3. Water supply and sewerage are removed from the ABS 'Electricity Gas and Water' sector to create an Energy sector in the *Report*.

Table 1 also includes data for the percentage of Tasmanian Gross State Product represented by value added in each sector, and it can be quickly established that a comparison of ABS and *Report* data raises doubts about the way in value added has been calculated in the *Report*. Consider the following:

1. The *Report*'s estimate of value added in Agriculture + Fishing is almost 50% *greater* than the ABS estimate for Agriculture + Fishing + Forestry.

[11] An alternative approach to that followed in the *Report* might have been to use the Tasmanian input-out data embedded in the CoPS MRRF model. This source provides sectoral detail to a finer classification than 16 sector classification usually published by the ABS. See Van Ho et al. (2008) for details as to how this approach was applied in constructing sectoral data for Tourism.

[12] See Van Ho et al. (2008).

2. The *Report*'s estimate of value added in Energy is *greater* than the corresponding ABS sector, even though the latter includes water and sewerage which, Australia-wide, comprise about half the value added in the ABS sector.
3. Assume half of the ABS manufacturing sector comprises forestry and mineral processing. Then the ABS estimate of the first three *Report* sectors would be around 14% of Gross State Product. The *Report* itself, however, estimates the contribution of these three sectors to be 24%. In other words, the *Report* overstates value added in these three sectors by almost *a factor of two*[13].

To see what went wrong, turn to the detail.

For a single enterprise, value added can be measured in two ways[14]:

(a) Sales *minus* purchases of goods and services from other firms, or
(b) Wages and salaries *plus* profits.

Now consider how value added has been calculated in the *Report*. This is done in two stages.

(i) In each of the 5 sectors, the *Report* first calculates the 'General Contribution to the Tasmanian Economy' (GCTE) which is presumably an estimate, for each sector, of the sum of wages and salaries *plus* state taxes *plus* profits *plus* purchases of intermediate goods and services from Tasmanian firms.

(ii) In the second stage, the *Report* uses these data to derive estimates of value added.

There are several basic errors in the application of this approach:

a) In estimating GCTE, there is no consistent distinction between purchases of goods and services from Tasmanian firms, and purchases from interstate and foreign firms. This can be most clearly seen by making a comparison, for example, of Table 2.3 in the *Report* and Forestry Tasmania's *Financial Reports*. Since the data in the two tables are identical, it can be deduced that Table 2.3 is referring to total purchases, not just those from Tasmanian firms.

   Nor is there any consistency in the way in which GCTE is measured across different sectors – for example, capital expenditures are included in the Mineral and Mining Sector (Table 2.8), but omitted from GCTE in other sectors.

b) The second stage, going from GCTE to value added, is also implemented incorrectly. The treatment of the forestry and timber processing sector provides an example of the error, which we can stylise using two 'firms';

   'FT'; the downstream firm, Forestry Tasmania.
   'WP'; or the aggregation of upstream wood-processing industries.

   Straightforward application of the first of the two definitions of value added would be to obtain value added for each of the two firms by calculating

[13] It is difficult to know the year to which the GSP share data refer, since *Report*, p.43 implies that 2006/07 sectoral amounts are derived as a share of 2007/08 Gross State Product. This error in the *Report* is immaterial to my main point.
[14] These brief definitions omit details, including the treatment of taxes, which are not essential here. A detailed description is available from ABS (undated).

'CGTE *minus* purchases of intermediate goods and services from Tasmanian firms'[15]

for FT and WP separately. In this way, purchases by FT from WP (and vice versa) would be netted out, and double counting would be avoided. Value added for the sector as a whole is then just the sum of value added in each of the two firms.

This does not appear to have been the approach taken in the *Report*. Rather, netting-out of intermediate goods is achieved by taking CGTE in FT, CGTE in WP, and deducting sales from FT to WP to get an estimate of value added for the sector as a whole. This approach significantly overstates value added for the sector because it does not also subtract purchases by FT and WP from firms outside the forestry and timber processing sector. We note, for example, that the data on 'CGTE by FT' reported in Table 2.3 and 'value added by FT' reported in Figure 3.1 are *identical*. This is clearly incorrect.

While the *Report*'s estimate of 7.53% is more realistic than Minister Bryan Green's ludicrous claim that in 2005 the industry contributed 23% of Gross State Product, the comparative data shown in Table 1 above suggest it is still it is still a significant overstatement[16].

Although problems in the *Report*'s approach to measuring value added are clearly illustrated in the forestry and timber processing sector, they also crop up elsewhere. Other examples:

(i) From the preceding discussion, it follows that value added in a sector *must* be less than CGTE in that sector, because CGTE includes purchases of intermediate goods which are deducted to obtain value added. This is not true for the *Report*'s estimate for Mining and Minerals. For this sector, a comparison of the CGTE data in 2006/07 (Figure 2.6) with value added data (Table 3.2) shows that value added is *greater* than CGTE!

(ii) Smelters such as Comalco, Temco and Nystar have, as an intermediate input, energy which is purchased from the Energy sector. Application of the definition 'CGTE *minus* purchases of goods and services from other firms' would mean that, among other intermediate goods, purchases of energy should be deducted from CGTE in the Minerals and Mining sector so as to obtain value added there. The *Report* does not do this. Instead, sales by Transend are reduced by this amount[17]. This mis-allocation of intermediate goods between sectors has the effect of incorrectly cutting the estimate of value added in the Energy sector and inflating it in the Minerals and Mining sector.

(iii) From the description provided in the report, it is difficult to check how GTCE was calculated for Agriculture and Fishing. The *Report* claims (p.35) that details for Fishing are provided in Appendix A. On the contrary, Appendix A only contains information related to Forestry.

Data are, however, provided for GTCE in Agriculture, from which value added is derived. In Table 2.9, the cell for 2004/05 GTCE is empty. The cells for 2005/06 and 2006/07 are apparently obtained from different and inconsistent sources. It is, in any case, unnecessary to make GTCE step if the purpose is to derive value added in Agriculture in the reference year as it is provided by the Australian Bureau of Statistics, and is 3.2% of Gross State Product[18].

Overall conclusion: the value added estimates in the *Report* are meaningless.

[15] I have simplified this discussion by omitting consideration of taxes.
[16] Green (2005), p.2.
[17] See *Report*, p.42.
[18] Australian Bureau of Statistics (2008).

5. Subsidies included in the denominator of the bang for buck ratio are restricted to direct cash payments. Restricting the definition of subsidies in this way is misleading and involves particularly important omissions in the 'Forestry and timber processing' sector and, most likely, for the 'Mining and minerals processing' sector.

The *Report* recognises that industry assistance takes a variety of forms. Some involve direct cash payments, some don't. In my report I included all forms of assistance to Forestry, and because some of them do not involve direct cash payments, estimates must be made. The way in which I made those estimates was clearly set out in my report.

The approach in the *Report* is different. Forms of assistance such as Managed Investment Schemes, or the implicit subsidy paid to Forestry Tasmania on account of its low rate of return, are omitted because they would require the analyst to make estimates rather than just rely on published data. My approach was to make estimates, get them into the public domain, and invite other analysts to refine them. The approach of the *Report* is to ignore them altogether.

Omission of cash payments made under the TCFA is particularly egregious. There can be no doubt that these payments fit the definition of 'direct subsidy' in the *Report*. But the *Report* argues that they should be excluded, because

> (i) the payments were 'compensation for the loss of timber resource created by the removal of logging in parts of the Styx Valley'[19]. Maybe they are a subsidy directed towards a specific purpose. Most subsidies are. But that is no ground for excluding them from consideration.
>
> (ii) they are 'of a capital nature and not of a recurring kind'[20]. It is hard to see why 'one-off' subsidies (in the case of the TCFA, extending over 6 years) should be excluded. On this logic, the 3-year payment of $115m to support continued operation of the TT line, should also be excluded from the analysis.

In my report I included an amount of assistance reflecting the fact that Forestry Tasmania has not operated on a commercially sustainable basis – its rate of return is well below the risk-free rate of return on 10-year Australian Government bonds. In my calculation of the subsidy, I made allowance for the fact that Forestry Tasmania may provide community benefits in its stewardship of the forests. I did not take account of the fact that logging old growth forests is, in economic terms, much the same as a mining activity on which royalties should be levied. So my estimate of subsidy was conservative. The *Report* ignores it altogether.

One suspects (but in the absence of public information, one can't be sure) that the sort of approach as was followed in my report might also apply to electricity supply contracts to major industrial users. To its credit Forestry Tasmania published details of their long term pulpwood supply agreement with Gunns.[21] There is no obvious reason why long term electricity supply contracts should not also be subject to public scrutiny.

Returning to Forestry, Managed Investment Schemes are excluded from the *Report*, along with other favourable forms of tax treatment – 'it is quite appropriate to disregard tax havens as a subsidy paid to industry when they benefit investors only'[22]. In the case of MIS in forestry this may be, in light of

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[19] *Report*, p.48.
[20] *Report*, p.14.
[21] See Wells (2007) for an analysis of this agreement.
[22] *Report*, p.12.

realised investor returns, an attempt at black humour but there is no doubt that by reducing the cost of capital to the forestry industry there has been a significant expansion in MIS plantation acreage and an increase in forestry value-added at the expense of other sectors.

Consider the following:

- In 2005 the Tasmanian Government argued for continuation of MIS schemes because

'The Tasmanian government is concerned that a policy change by the Australian Government could undermine investment decisions and jeopardise crucial investments. For example, if a policy change resulted in a significant reduction in plantation development in Tasmania, the outcome could place at risk the proposed Gunns pulp mill …'[23]

- Recording the favourable outcome of the inquiry into MIS schemes, the Commonwealth Department of Agriculture, Fisheries and Forests noted that

'A number of planned key project proposals, valued at several billion dollars, depend directly on further expansion of the MIS plantation sector. They include the Gunns pulp mill in Tasmania, the Protavia pulp mill at Penola in the Green Triangle, expansion of the Visy pulp mill at Tumut in NSW and the PaperlinX pulp mill upgrade at Maryvale in Victoria.'[24]

- This outcome was enthusiastically endorsed by Gunns who, no doubt grateful that revenue from the managed investment business was growing strongly, noted that

'The industry has lobbied tirelessly to ensure that the government fully understands the significant benefits of the expanding forest industry to regional and rural Australia. Over $4 billion worth of value-adding processing plants are being planned or developed in regional areas around Australia on the back of MIS funded plantations including Gunns Ltd's $1.4 billion pulp mill at Bell Bay.'[25]

Have MIS schemes increased the scale of Tasmanian forestry? Yes. Have they increased returns to growers? Of course. Lawrence (2009) shows that MIS activities have provided up to 50% of Gunns pretax profits in recent years – a benefit to growers, not investors. Is this a subsidy that should be included in the analysis? Of course.

The *Report* reaches its conclusion that Forestry and Forestry Processing is lightly subsidised by omitting most of the assistance included in my report.

The allocation of subsidies is puzzling in other respects. For example, the payment of $115m to the TT line is allocated entirely to Tourism, in spite of the fact that the ferries carry general freight. Payments made to the Tasmanian Aquaculture and Fisheries Institute are included as a subsidy to Agriculture and Fisheries, but payments to the Co-operative Research Centre for Forestry are excluded. And so on.

It is hard to escape the conclusion that the *Report* defines subsidies in such a way as to minimise those allocated to forestry, and to increase those allocated to other sectors.

[23] Department of Infrastructure, Energy and Resources (2005), p.2.
[24] Taken from 'Forestlinks', Department of Agriculture, Fisheries and Forests, August 2007 (emphasis added).
[25] Gunns Plantations Limited, *Newsletter*, Spring 2006.

6. Claims made in media releases by the Forestry Industry Association of Tasmania and by Forestry Tasmania, based on this Report, are not justified.

Dr Drielsma : 'This *Report* clearly shows subsidies benefits consumers as well as producers, and generate jobs and income for Tasmanians'[26].

> This claim was analysed on p.1 above, and was shown to be based on a fundamental misunderstanding of how the results in the *Report* can be interpreted.

Mr Edwards: 'These results show there is good reason for industry assistance by government, particularly during the Global Financial Crisis.'[27]

> The *Report* makes no mention of the Global Financial Crisis. The rest of this claim is a variation on the one made by Drielsma, and suffers from the same deficiencies.

Unattributed: 'the least subsidised sectors were energy, and mining and mineral processing followed by timber processing with agriculture and fishing and tourism the most heavily subsidised.' [28]

> Given the errors in calculating value added and the narrow definition of industry assistance, the *Report* has nothing reliable to say on this issue.

Mr Edwards: 'We were surprised that this work has never been carried out before.' [29]

> Yes, one might have expected the Department of Economic Development or the Treasury to be more actively involved in assessing the effectiveness of industry assistance, and to be more open in publishing their findings.
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> If this debate stimulates more active analysis of these issues, that will be a positive outcome.
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> But the flawed methodology of this *Report* is not the template to follow.

[26] H. Drielsma, quoted in Forestry Tasmania media release, 14 June 2009.
[27] T. Edwards, quoted in Forestry Tasmania media release, 14 June 2009.
[28] Forestry Tasmania media release, 14 June 2009.
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Appendix1 Industry share of gross Value Added: Tasmania
per cent

	1990	1991	1992	1993	1994	1995	1996	1997	1998	1999	2000	2001	2002	2003	2004	2005	2006	2007	2008
Agriculture, forestry and fishing	1.86	1.93	1.80	2.43	2.40	2.40	3.64	3.49	5.10	5.01	4.91	5.01	5.03	4.48	4.67	5.40	4.68	4.61	4.62
Mining	4.90	5.33	6.26	7.14	6.88	5.84	5.56	4.59	4.83	4.55	4.22	3.28	3.22	3.16	3.08	2.83	2.66	2.62	2.56
Manufacturing	21.42	20.67	19.24	18.48	18.48	18.26	18.02	18.79	18.72	17.96	16.96	16.18	14.93	14.75	14.58	14.39	14.23	14.00	14.12
Electricity, gas and water	5.41	5.48	5.37	5.16	5.06	4.74	4.66	4.80	4.64	4.52	4.55	4.55	4.35	4.30	4.01	4.16	4.25	4.08	3.93
Construction	4.35	4.20	3.95	3.94	4.06	4.01	3.89	3.86	3.88	4.07	4.41	3.99	4.78	4.65	5.24	5.25	5.34	5.43	5.45
Wholesale trade	3.50	3.40	3.34	3.36	3.55	3.60	3.59	3.72	3.76	3.56	3.44	3.08	2.68	2.85	2.86	2.96	3.17	3.29	3.13
Retail trade	5.38	5.64	5.88	5.86	5.99	5.69	5.59	5.89	5.84	5.73	5.77	5.98	5.92	5.91	6.15	6.26	6.50	6.61	6.55
Accommodation, cafes and restaurants	2.67	2.97	2.81	2.63	2.75	2.90	2.70	2.81	2.61	2.52	2.58	2.49	2.25	2.37	2.45	2.49	2.47	2.42	2.58
Transport and storage	3.51	3.93	3.79	3.68	3.93	4.17	4.21	4.01	3.92	3.63	3.79	4.09	4.17	4.48	4.86	4.82	4.98	5.28	5.24
Communication services	1.23	1.31	1.40	1.52	1.62	1.66	1.67	1.77	1.84	1.90	1.91	1.90	1.91	2.02	2.06	2.03	2.14	2.23	2.31
Finance and insurance	6.21	6.41	6.28	5.87	5.62	4.91	3.92	3.56	3.96	4.61	5.20	5.47	5.58	5.38	5.13	4.84	5.34	5.67	5.80
Property and business services	4.82	5.23	4.73	4.51	4.49	4.83	4.25	4.86	4.99	4.71	5.06	5.42	5.02	5.30	6.07	5.98	5.79	5.80	6.07
Government administration and defence	6.20	6.15	6.89	6.57	6.17	6.77	6.63	6.14	5.87	5.96	5.81	5.58	5.67	6.39	5.68	5.73	5.52	5.48	5.32
Education	6.12	6.16	6.25	6.54	6.39	6.22	5.99	6.14	6.04	6.04	5.92	6.02	5.83	5.74	5.71	5.49	5.46	5.28	5.18
Health and community services	6.67	7.18	7.23	7.16	7.22	7.36	7.57	7.76	7.60	7.48	7.78	8.09	8.52	8.32	8.29	8.13	8.35	8.46	8.44
Cultural and recreational services	1.48	1.52	1.54	1.43	1.36	1.38	1.31	1.38	1.46	1.39	1.40	1.52	1.51	1.53	1.50	1.50	1.51	1.46	1.45
Personal and other services	1.61	1.68	1.59	1.53	1.52	1.53	1.56	1.77	1.60	1.61	1.62	1.71	1.69	1.72	1.51	1.77	1.88	1.97	1.91
Ownership of dwellings	6.64	6.76	6.89	6.87	6.90	6.88	6.69	6.99	6.84	6.82	7.03	7.26	7.16	7.21	7.21	7.23	7.32	7.34	7.23

Source: Derived from ABS(2008), Table 7.