

## **GENERAL EFFECTS OF RBT**

This report was compiled following a request for elaboration on evidence presented on 12 November to the Senate Finance & Public Administration References Committee - *Inquiry into Business Tax Reform.*

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Econtech Pty Ltd  
P.O. Box 4129  
Kingston ACT 2604  
Phone: (02) 6295-0527  
Fax: (02) 6295-8513  
E-mail: [econtech@pcug.org.au](mailto:econtech@pcug.org.au) (until November 1999)  
[office@econtech.com.au](mailto:office@econtech.com.au) (from December 1999)  
web-site: [www.econtech.com.au](http://www.econtech.com.au) (from December 1999)

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### Disclaimer

This analysis has been prepared following a request from the Senate Finance & Public Administration References Committee - *Inquiry into Business Tax Reform*. It was provided to assist the Inquiry understand the general effects of the proposals to reform business tax. Econtech Pty Ltd accepts no responsibility or liability for use of this material by any other person or for any other purpose.

## Executive Summary

This report estimates the general economic effects of the major proposal of the Review of Business Tax (RBT), namely cutting the company tax rate from 36 to 30 per cent and funding this principally by abolishing the accelerated depreciation tax concession. The industry effects of the proposed changes to business tax have already been analysed in the accompanying Econtech report on the "Industry Effects of Tax Reform".

The RBT model was constructed specially for this report. It makes the standard assumptions used in long-term economic modelling and has special detail in the business tax area.

Dropping the company tax rate from 36 to 30 per cent makes more projects viable for foreign investors. Abolition of the accelerated depreciation tax concession has a partly offsetting effect, increasing the average tax life of capital assets from 6.2 to 7.8 years. The major effects of both proposals taken together are as follows:

- ◆ the overall cost of capital falls by 3.9 per cent;
- ◆ real wages rise by 2.0 per cent;
- ◆ real GDP rises by 1.5 per cent; and
- ◆ living standards, as measured by consumption, rise by 0.4 per cent or \$1.7bn annually.

These gains arise because the major RBT proposal gives Australia an internationally competitive company tax rate, and removes the distorting affected of accelerated depreciation concessions on the structure of the capital stock.

After allowing for uncertainty about the precise values of key parameters, the annual consumer gain should be expressed as \$1-2bn, rather than the misleadingly precise \$1.7bn. The "growth dividend" provision in the revenue figuring for the RBT Report was conservative because it assumed a gain in GDP of 0.5 to 0.75 per cent, whereas the modelling here points to a higher gain of 1.5 per cent.

Dixon and Rimmer have prepared a paper for this inquiry that analyses a "hypothetical project". "Under the current system it is depreciated over 10 years whereas under Ralph it would be depreciated over 20 years." (p.4).

In reality, the abolition of accelerated depreciation increases average tax lives on an economy-wide basis from 6.2 years to 7.8 years, an increase of less than two years, not 10 years as in Dixon and Rimmer's hypothetical and unrepresentative project.

By overstating the significance of accelerated depreciation concessions, Dixon and Rimmer wrongly find that the RBT proposals that they consider result in an average annual gain in government revenue of a huge \$3 billion, rather than an average annual loss of about \$0.3 billion. This false increase in the burden of business tax leads them to the further false conclusion that business investment will be lower. In contrast, for the representative (rather than hypothetical) project considered in this paper, business investment is up by over 4 per cent.

Dixon and Rimmer conclude that more work is needed but do not make a case for this as the issues that they plan to address have already been covered in the two Econtech reports.

## 1. Introduction

This report estimates the general economic effects of business tax reform. These general effects include the effects on GDP or the "growth dividend", the effects on consumption or living standards, and the effects on the size and composition of Australia's stock of business capital. This report examines only the major proposal of the Review of Business Tax (RBT), namely cutting the company tax rate from 36 to 30 per cent and funding this principally by abolishing the accelerated depreciation tax concession.

This report does not deal with the industry effects of business tax reform. This is because the industry effects of all of the government's proposed changes to business tax (not just the major changes) have already been analysed in the accompanying report from Econtech on the "Industry Effects of Tax Reform".

This report also does not deal with the effects on government revenue of tax reform. The Treasury and Australian Taxation Office have far more information and resources in this area than anyone else, so no outsider can produce comprehensive, independent estimates that rival the costings of 53 different measures found in Attachment O of the Treasurer's Press Release of 11 November. Of course independent analysts can (and have) commented on the reasonableness of some of the underlying assumptions. In that regard, this report is able to assess the reasonableness of the official estimates of the "growth dividend" effect on government revenue.

## 2. Model

This report analyses the general effects of the major RBT proposal using a simple economic model tailor made for that purpose, and is known as the RBT model.

In all respects, the RBT model makes the standard, widely-used long-term assumptions in this type of economic modelling. These standard long-term assumptions are:

- the after-tax rate of return on capital that is required in Australia is determined outside of Australia on world capital markets;
- national employment is fixed;
- businesses maximise profits;
- there is constant returns to scale in production; and
- the level of Australian-owned capital is fixed (national saving assumption).

The RBT model also has special detail in the areas important for this report:

- business tax is modelled including company tax and the accelerated depreciation tax concession;

- businesses choose their capital structure (i.e. how it is divided between buildings, vehicles, computers etc); and
- businesses choose their capital-labour mix.

This model is set out in full in Attachment A, so the results in this paper can be fully reproduced and reviewed by others.

### 3. Model Inputs

The major RBT proposal was simulated by varying the inputs into the RBT model as shown in Table 1. This involves cutting the company tax rate from 36 to 30 per cent. It also involves extending the write-off period for tax purposes for each asset class from the concessional "tax lives" currently in use to the "stated lives", which we take to be the true lives. Data on these asset lives were calculated from more detailed information in the Master Tax Guide.

**Table 1**  
**Model Inputs**

	no RBT	RBT	weight
company rate	36%	30%	
tax lives (years):			
- road vehicles	6.7	6.8	13%
- other transport equipment	6.1	9.2	2%
- computers	4.0	5.0	2%
- electronic equipment	6.5	10.6	5%
- industrial machinery	6.3	9.7	14%
- other equipment	5.1	7.7	6%
- buildings	40	40	58%
economy-wide weighted average (a)	6.2	7.8	
Dixon and Rimmer paper	10	20	

(a) The economy-wide weighted average asset life is calculated by converting asset lives to depreciation rates, applying economy-wide capital stock weights to those depreciation rates (shown in the last column of the table), and then converting back to an asset life.

### 4. Results

The changes shown in Table 1 have two effects on the cost of each type of capital.

Foreign investors currently expect or require an average after-tax return on their (Australian) investments of 10.2% p.a. Under the existing company tax rate of 36 per cent, this means that the pre-tax rate of return has to be as high as 15.9% p.a. for the project to be viable. Dropping the company tax rate from 36 to 30 per cent drops the pre-tax rate of return needed to achieve the required after-tax rate of return from 15.9% p.a. to 14.6% p.a. This lower required pre-tax rate of return makes more projects viable.

At the same time, abolition of the accelerated depreciation tax concession has a partly offsetting effect. A summary indicator of the significance of abolishing accelerated depreciation is that the weighted average tax life of all capital assets is increased from 6.2 to 7.8 years. As Table 1 shows, the increase is more for some assets than for others.

The RBT model results show that the cut in the company tax rate outweighs the abolition of accelerated depreciation such that the overall cost of capital falls by 3.9 per cent. This leaves more of the income from national production available for labour, and the real wage rises by 2.0 per cent. This implies a cheapening in the cost of capital relative to labour of 5.9 per cent, leading to the adoption of more capital intensive production methods.

With national employment assumed to be fixed in the long-term, the national capital stock rises by 4.6 per cent. (This approximately equals the assumed elasticity of substitution between labour and capital of 0.75 times the fall in the cost of capital relative to labour of 5.9 per cent.) With capital accounting for about one-third of the income from national production, this extra capital generates a gain in GDP of 1.5 per cent.

This additional capital, which under the modelling assumptions is owned by foreigners, does have some costs. Part of the gain in GDP needs to be diverted to the trade balance (net exports) to cover the cost of servicing the extra foreign-owned capital. A further part of the gain in GDP needs to be diverted to business investment to maintain the additional capital. However, this still a net gain that takes the form of an increase in total consumption (which covers private and public consumption) of 0.4 per cent, as shown in Table 2. This represents an annual gain in living standards of \$1.7 billion.

**Table 2**  
**Results: Growth Dividend**

	change (\$bn)	%change
gross domestic product	7.6	1.5%
- consumption	1.7	0.4%
- investment	3.6	4.2%
- net exports	2.3	0.5%(a)
capital stock (composite)		4.6%

(a) Contribution to percentage change in GDP.

The revenue figuring for the RBT Report included a "growth dividend". The RBT Report stated that its starting point in estimating a growth dividend was a "conservative" assumption that its business tax reform package would add 0.5 to 0.75 per cent to GDP. Econtech's modelling reported in Table 2 shows a long-term gain in GDP of 1.5 per cent, confirming that the RBT Report assumption for the growth dividend was indeed conservative.

The economic gains shown in the modelling results reflect the fact that the proposed business tax reforms remove two distortions to decision making in the Australian economy.

First, Australia's existing company tax rate of 36 per cent is internationally uncompetitive, inducing businesses to artificially economise on capital. This holds back Australia's capital stock, production, productivity, real wages and living standards. This problem is addressed by lowering the company tax rate to an internationally competitive rate of 30 per cent.

At the same time, there is a limit to the extent to which the company tax rate should be lowered. If the rate were reduced much below the proposed rate of 30 per cent, some foreign investors would reach a situation where their Australian company tax was fully claimable as a credit against the company tax payable in their own country. Reductions in the Australian company tax rate beyond that point would not make investment in Australia any more

attractive for them, and would have the adverse effect of effectively transferring tax revenue from the Australian Government to a foreign government.

Second, the accelerated depreciation tax concession shortens the tax life of some assets more than others, with no rhyme or reason. This affects the pattern of business investment, distorting the structure of the capital stock. Thus Table 3 shows how the major business tax reforms correct this distortion. While the lower company tax rate encourages an increase in all types of capital, the abolition of accelerated depreciation means that the largest percentage gains are for buildings, road vehicles and computers, which are assets that have minimal or no access to accelerated depreciation.

**Table 3**  
**Results: Capital Structure**

	%change
capital stock (composite)	4.6%
- road vehicles	4.5%
- other t'port equipment	2.6%
- computers	3.1%
- electronic equipment	2.3%
- industrial machinery	2.5%
- other equipment	2.4%
- buildings	6.3%

## 5. Sensitivity Analysis

The estimates of the economic gains from the major RBT proposal are affected by the values of key elasticities. The exact values of these elasticities are unknown — economists only have an approximate idea.

Different, equally plausible values could have been chosen for the elasticities, resulting in different estimates of the consumer gain. To draw out this point, the RBT model was re-simulated using alternative assumptions about the values of the key elasticities. The resulting alternative estimates of the consumer gain are reported in Table 4.

The results in the previous section assumed a capital-labour elasticity of 0.75 and a capital-capital elasticity of 0.50, giving an annual consumer gain of \$1.7bn. This is reported more accurately in the highlighted entry of Table 4 as \$1.66bn.

**Table 4**  
**Consumption Gain Under Alternative Elasticity Assumptions**  
**(\$ billion/year)**

capital-capital:	labour-capital:		
	0.5	0.75	1.00
0.25	1.07	1.58	2.08
0.50	1.15	<b>1.66</b>	2.17
0.75	1.23	1.75	2.26

The true value of the capital-labour elasticity is probably somewhere between 0.5 and 1.0. Table 4 shows that using the lower figure gives a consumer gain of \$1.15bn while using the

upper figure gives \$2.17bn. The consumer gain is therefore fairly sensitive to the value assumed for this elasticity.

A high value for the elasticity means there is a high degree of substitution possible between capital and labour. If this is true, it implies that an uncompetitively high company tax rate of 36 per cent would cause business to artificially economise on capital to a considerable extent. Thus moving to an internationally competitive company tax rate would result in a relatively large gain. The converse interpretation implies if a low value is used for this capital-labour elasticity.

The true value of the capital-capital elasticity is probably somewhere between 0.25 and 0.75. Table 4 shows that using the lower figure gives a consumer gain of \$1.58bn while using the upper figure gives \$1.75bn. The consumer gain is therefore not very sensitive to the value assumed for this elasticity.

A high value for the capital-capital elasticity means there is a high degree of substitution possible between different types of capital. If this is true, it implies that the uneven pattern of accelerated depreciation concessions would be distorting the structure of the nation's capital stock to a considerable extent. Thus abolishing accelerated depreciation (while reducing the company tax rate) would considerably improve the structure of capital, resulting in a relatively large gain. Of course, the converse interpretation implies if a low value is used for this capital-capital elasticity.

Overall, a scan of the results in Table 4 suggests that, given the uncertainties, the annual consumer gain from the major RBT proposals should be expressed as \$1-2bn.

## **6. Dixon and Rimmer Paper**

Dixon and Rimmer have prepared a paper for this inquiry on "Company taxes, Depreciation allowances and Capital gains: some effects of Ralph". Like this paper, it aims to draw conclusions on the general effects of key RBT proposals.

Dixon and Rimmer analyse a "hypothetical project" (p. 4). They state:

"We have assumed that under the current system it is depreciated over 10 years whereas under Ralph it would be depreciated over 20 years." (p.4)

This hypothetical project is not representative of a typical investment project in the Australian economy. As shown in Table 1, taking into account the capital structure of the entire economy, the abolition of accelerated depreciation increases the weighted-average tax life from 6.2 years to 7.8 years. This is an increase of less than two years, compared with the increase of 10 years considered in Dixon and Rimmer's unrepresentative project.

### **6.1 Unrepresentative project**

Despite its unrepresentative nature, Dixon and Rimmer use their hypothetical project to draw conclusions about the effects of the RBT proposals on the economy generally in their concluding remarks. This is invalid.

[Unlike the Dixon and Rimmer paper, this paper uses an investment project that is representative of investment projects across the economy. It has the same capital structure as the economy's capital structure. Thus this paper can draw valid conclusions about the effects of RBT proposals on the economy generally, but the Dixon and Rimmer paper cannot.]

By using a hypothetical example where accelerated depreciation concessions are far more significant than they are in the economy generally, Dixon and Rimmer are led to a number of false conclusions.

First, by greatly overestimating the gain to government revenue for abolition of accelerated depreciation, they arrive at the false conclusion that the RBT proposals that they consider produce an increase in the burden of business tax.

Specifically, Dixon and Rimmer claim that the RBT proposals that they consider, namely the cut in the company tax rate, abolition of accelerated depreciation and changes to capital gains tax, result in:

"an increase in taxation revenue over the next 20 years of between 1 and 3 per cent of capital income (p.9)".

Using the figure at the middle of their range of 2 per cent implies an average annual gain in government revenue of a huge \$3 billion.

The Government's own figuring for the same measures shows an average annual loss over the next five years of about \$0.3 billion. (This is converted to a gain of about \$0.3 billion through measures not considered by Dixon and Rimmer, such as the anti-avoidance measures.)

If Dixon and Rimmer were to be believed, the conclusion of the Inquiry on its main terms of reference would be that the RBT proposals are strongly revenue positive, far more so than suggested by the government.

Second, Dixon and Rimmer's false conclusion that the RBT proposals that they consider produce an increase in the burden of business tax leads them to the further false conclusion that business investment will be lower.

In contrast, for the representative project considered in this paper, business investment is up by over 4 per cent.

## 6.2 Segmented Capital Markets

Perhaps the most unusual aspect of the Dixon and Rimmer paper is that it assumes that Australia has three separate capital markets. Foreign investors, local corporates, and local unincorporated enterprises all have different valuations of the same hypothetical project. This ignores the fact the foreign and local investors alike trade in the same shares on the Australian Stock Exchange and pay the same prices for them.

A more standard assumption is the one made in this paper, namely that the after-tax rate of return on capital that is required in Australia is determined outside of Australia on world

capital markets. Far from being isolated from world capital markets, Australia is highly integrated into them.

The implication of this for the Dixon and Rimmer paper is that only the results presented for the foreign investor are meaningful. The separate results for local corporates and local unincorporated enterprises can be disregarded.

### 6.3 More Work?

Dixon and Rimmer conclude by pitching for more work ("at least three months" more work).

They state that they need to broaden their work to consider "many different types of projects". Really they need to consider a representative project, not a hypothetical project, but that has already been done in this paper.

Dixon and Rimmer also claim that they "need to specify typical projects for different industries". This has already been done in the accompanying paper on "Industry Effects of Tax Reform". Also, similar work was published as section 25 of the RBT Report, which has now been available for more than two months. With this long period of scrutiny, significant faults in that earlier work have not been identified, so it is difficult to see a reason for further work now.

## Attachment A: Model in Detail

### A.1 Equations

#### *GDP Identity*

$$Y = C + I + NX$$

#### *CES Production Function*

$$Y = [(an*N)^{\rho} + (ak*K)^{\rho}]^{1/\rho}$$

#### *Investment*

$$I = \Sigma(\delta(i) + g)*K(i)$$

#### *Net Export Requirement for External Balance*

$$NX = (\theta - g)*(\Sigma K(i) - KP)$$

#### *Marginal Product of Capital*

$$K = (MPK/ak)^{-\sigma}*(Y/ak)$$

#### *User Cost of Capital - Aggregate*

$$MPK = \Sigma PK(i)*K(i)/K$$

#### *User Cost for Capital of Type i*

$$PK(i) = \delta(i) + \theta/(1-ct) - \theta*[ct/(1-ct)]*[d(i)-\delta(i)]/[d(i)+\theta]$$

#### *Cost-minimising Capital Structure*

$$K(i)/K = (1/b(i))*\{[PK(i)/b(i)]/MPK\}^{-\gamma}$$

### A.2 Definitions: model outputs

Y≡gross domestic product

C≡consumption (private plus public)

I≡gross investment

NX≡net exports

K≡capital stock - aggregate

K(i)≡capital stock of type i (i=1...7)

MPK≡marginal product of capital

PK(i)≡user cost of capital of type i (i=1...7)

### A.3 Definitions: preset model inputs

ct≡rate of company tax=36%/30%

N≡employment=8.5 million

g≡growth rate=3.5%

σ≡labour-capital elasticity of substitution = 1/(1-ρ) = 0.75

γ≡capital-capital elasticity of substitution = 1/(1-φ) = 0.5

#### A.4 Definitions: calibrated model inputs

KP≡Australian-owned capital=\$453bn

$\theta$ ≡world required after-tax rate of return on capital=10.2%

an≡scale parameters for employment in CES production function=201.6

ak≡scale parameters for capital in CES production function=18.82

The above four values were calibrated using both the preset model inputs and the following data/assumptions about the baseline position:

- two-thirds of capital is Australian owned
- capital stock is \$679bn
- average annual wage is \$38,600
- GDP is \$496bn

#### A.5 Capital Structure Inputs

Master Tax Guide data were used on the stated and tax lives of each type of capital. These lives, which are based on straight line depreciation, were converted to equivalent depreciation rates where depreciation is a fixed proportion of written down value. The conversion method equated the mean asset lives. ABS data was used for the value of each type of capital stock in calibrating the capital stock parameters.

##### true/RBT depreciation rates

	stated life	dep'n rate – $\delta(i)$
- road vehicles	6.8	20.4%
- other t'port equipment	9.2	15.0%
- computers	5.0	27.7%
- electronic equipment	10.6	13.1%
- industrial machinery	9.7	14.3%
- other equipment	7.7	18.0%
- buildings	40	3.5%

##### accelerated depreciation rates for tax purposes (no RBT)

	tax life	dep'n rate – $d(i)$
- road vehicles	6.7	20.5%
- other t'port equipment	6.1	22.7%
- computers	4.0	34.7%
- electronic equipment	6.5	21.2%
- industrial machinery	6.3	22.1%
- other equipment	5.1	27.4%
- buildings	40	3.5%

##### calibrated values for capital stock parameters

	value (\$bn)	b(i)
- road vehicles	90	38.9
- other t'port equipment	15	1831
- computers	12	1893
- electronic equipment	36	318
- industrial machinery	97	42.1
- other equipment	38	246
- buildings	392	3.84

**Attachment B: Results in Detail**

	no RBT (\$bn)	RBT (\$bn)	change (\$bn)	%change
gross domestic product	496.0	503.6	7.6	1.5%
- consumption	394.4	396.0	1.7	0.4%
- investment	86.5	90.2	3.6	4.2%
- net exports	15.1	17.3	2.3	0.5%(a)
capital stock (composite)	679.3	710.5	31.2	4.6%
- road vehicles	90.0	94.0	4.0	4.5%
- other t'port equipment	14.5	14.9	0.4	2.6%
- computers	11.9	12.2	0.4	3.1%
- electronic equipment	36.2	37.0	0.8	2.3%
- industrial machinery	97.0	99.5	2.4	2.5%
- other equipment	37.8	38.7	0.9	2.4%
- buildings	391.9	416.8	24.9	6.3%

(a) Contribution to percentage change in GDP.