Economic Analysis of the RSPT

WITH A POSTSCRIPT ON THE NEGOTIATED OUTCOME

This note was originally prepared to support a presentation made by Brian Parmenter at Norton Rose on 15 June 2010. On 2 July 2010, the new Prime Minister, Julia Gillard, announced substantial changes to the Resources Super Profits Tax (RSPT) proposed by her predecessor, Kevin Rudd, rechristening it the Minerals Resource Rent Tax. We have opted to leave the main part of the note in its original form; it explains how rent taxes work and identifies the key deficiencies of the RSPT. We have added a postscript that addresses the recently announced changes.

1 Introduction

This note looks at various aspects of the economics of the government's proposed Resource Super Profits Tax (RSPT). These relate to details of arrangements for taxing mining companies. But it is not really details of the arrangements that lie at the heart of the dispute that has erupted between the miners and the government since the RSPT proposal was announced. The crux of that dispute is much simpler; it is just about the retrospective aspect of the RSPT[1] and about the RSPT rate. Retrospectivity and a high rate are essential to the role that the RSPT is intended to play in the government's budget strategy, including the government's ambition to get the Commonwealth budget back to surplus by 2012-13, three years ahead of schedule.

Companies would always prefer to pay less tax than more and, especially if they are in high-risk areas, they are understandably upset if the rules of the game are changed just because things have turned out well for them. And from society's point of view, the problem is that their being upset might translate into their demanding higher rates of return if they are to continue to invest in Australia.

But, that said, if the current dispute between the miners and the government is to be resolved, it is likely that the resolution will have to be found in modifications to details of the RSPT design[2]. Moreover it does seem as though there must be problems with the particular design that the government has proposed for the tax. A good indicator is that both of the economists credited with the underlying

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1 The proposed RSPT is retrospective in the sense that it is to apply to current and future profits from existing mining projects as well as to future profits from new projects. The government has not proposed that past profits from existing projects should be taxed retrospectively.

2 We note, however, that to date the has relied on two other means to resolve the impasse: pork-barrel expenditure, designed to win support for the RSPT at the State level, and the negotiation of special deals with individual mining companies, in some cases on an individual- project basis.

idea and cited by the government (George Fane and Ben Smith) have objected to the proposal in the national press (Fane, 2010; Smith, 2010). And, as is explained below, you should not take too much comfort from the KPMG Econtech (2010a) modelling on which the government relied to demonstrate the economic benefits of the RSPT, nor from the views of the 20 prominent Australian economists who recently signed an open letter supporting the government's proposal (Economists, 2010).

Almost all economists, and most mining companies, agree that taxing economic rent accruing to mineral deposits is more efficient than taxing the quantity or value of mineral production. The reason is that, in addition to mineral deposits, mineral production requires inputs (e.g., labour and capital) that could be used for other purposes. Taxing production reduces the returns that these mobile inputs can earn producing minerals and tends to divert them to other uses. But mineral deposits have no use other than producing minerals; hence taxing their rents will not cause them to move in to other uses. The 20 economists essentially just restate this uncontroversial proposition and the KPMG Econtech modelling just expresses it numerically. Neither the economists nor KPMG Econtech tackle any of the details of what the government has actually proposed.

What is contentious is whether rent accruing to mineral deposits can be identified sufficiently clearly to allow it to be taxed in practice: in particular, whether rent can be separated from returns to (potentially mobile) capital.

The problem arises when no market for mineral deposits is established independent of the market for produced minerals. Auctioning the right to explore for mineral deposits and then to produce minerals from deposits that are discovered is one way to establish an independent market for the deposit. Rent taxes depend on measuring rent without the aid of signals from such a market.

Another problem with the theoretical argument that taxing resource rents is efficient is that it relies on an assumption that investors will undertake all investments that cover the investor's cost of capital. It is true that if an investment covers its cost of capital in the absence of a pure rent tax it will continue to do so after the tax has been imposed. But suppose investors are capital constrained, i.e., suppose that they have not already invested in all projects that cover their cost of capital. Investing in a resource project in Australia allows the investor to earn their cost of capital and to expropriate some proportion of the rent accruing to the mineral deposit. The investor subjected to increased taxation by the imposition of a pure rent tax still earns their cost of capital but now expropriates a smaller share of the resource rent. This could mean that the total return (cost of capital *plus* share of rent) available by investing scarce capital in Australia is now less than the total return available elsewhere from a project in which the investor is not currently invested. In that case, the capital-constrained investor may transfer their funds away from Australia.

In the rest of this note we will:

- explain, using a very simple example, how different forms of resource rent taxation work
- explain the key design flaw in the proposed RSPT as it applies to new projects
- explain the retrospectivity problem
- elaborate on the limitations of the KPMG Econtech modelling on which the Treasury relied
- outline a modelling program that could throw more light on difficulties associated with the RSPT proposal.

2 Forms of Rent Taxation

Some forms of resource rent taxation depend on an explicit measure (or estimate) of rent. The Petroleum Resource Rent Tax (PRRT) that is levied on Australian offshore oil deposits is an example of this. But the RSPT, and the so-called Brown Tax of which it is a derivative, requires no such explicit measure of rent. In this section, we will explain the fundamental mechanics of both of these forms.

To do so, we will use the numerical example set out in Table 1. Table 1 leaves out lots of interesting details associated with the application of resource rent taxes but it will do to make our main points. We include some shaded cells in the table to elaborate on our main points that are made in the unshaded cells.

The arrangements described in the table are entirely prospective, i.e., they refer only to ways of taxing projects that are not yet in existence – we will come to retrospectivity in section 4.

The first row of numbers in the table describes the project that is to be taxed. It involves an outlay of $100 today with the equal prospects of returning either nothing or $300 in a year's time. Rent is defined as the actual return *less* the required return for a project of this risk (i.e., the cost of capital, which we assume is 20%). The expected rate of return on the project is 50%; hence, it generates $30 in expected rent.

2.1 PRRT

One way to tax the project's rent is to apply a PRRT-type tax. This type of rent tax was originally proposed by Garnaut and Clunies-Ross (1979).

As illustrated by the PRRT block in Table 1, such a tax defines the tax base (estimates rent) by specifying normal rates of return for investment in

exploration and production activities. For our numerical example, we have used 20% as the specified normal rate of return (the same as assumed in describing the project in row 1). Eligible costs are compounded forward at this rate and deducted from revenue prior to the tax being levied. The tax base (the measure of rent under the tax) is the excess of revenue over compounded eligible costs. If the project fails, the company faces negative rent ($120) but if it succeeds, the company is left with positive rent ($282). If the tax base never becomes positive (e.g., if the project never earns revenue) no tax is levied but the investor bears all of the costs incurred. Note that in expected-value terms, the government receives 30% of the rent, even though the tax rate is only 10%. The basic reason is that although the government takes about 10% of any positive rent, it contributes nothing when rent is negative.

As emphasised by Smith (1999), under such a tax the choice of the normal rates of return (together with the setting of the tax rate) is crucial to whether the tax distorts investment decisions. Broadly speaking, if the rates are set below the investor's relevant cost of capital, investment that would have been undertaken in the absence of the tax will be discouraged. On the other hand, if they are set above the relevant cost of capital, investment that would not have been undertaken in the absence of the tax will be encouraged.

2.2 Brown Tax

The next two rows in the table illustrate a pure Brown Tax (Brown, 1948). The so-called Brown Tax is not really a tax at all; it is a joint venture between the government and the private-sector investor. Under the Brown Tax, the government contributes a pre-specified proportion (40% in our example) of *all* the costs of the mineral project *when the costs are incurred*. Similarly, it receives the same proportion of all project revenues.

If you assume that the normal rate of return relevant to the government's investment in the project is the same as the rate relevant to the private-sector investor's, then the proportion of the rent that the government appropriates is the same as the proportion of project costs that it contributes and the proportion of revenues that it earns.

	Cash flows				Rent		
	Year 1	Year 2					
		Fail	Succeed	EV	Fail	Succeed	Expected value
PROJECT	-100	0	300	150	-100×1.2=-120	300-100×1.2=180	30
PRRT							
Company	-100	0	300-0.1(300-100×1.2)=282	141	-100×1.2=-120	282-100×1.2=162	21
Government	0	0	0.1(300-100×1.2)=18	9			9
BROWN TAX							
Company	-60	0	0.6×300=180	90	0.6×(-120)=-72	0.6×180=108	18
Government	-40	0	0.4×300=120	60	0.4×(-120)=-48	0.4×180=72	12
Loan							
Company	-40	42	42	42			
Government	40	-42	-42	-42			
RSPT(=BT+Loan)							
Company	-100	0.4(100×1.05)=42	300-0.4(300-100×1.05)=222	132			132-60×1.2-40×1.05=18
Government	0	-42	0.4(300-100×1.05)=78	18			18-40×1.2+40×1.05=12

Assumptions: Probability of success = 0.5; Required rate of return = 0.2; PRRT rate =0.1; Brown Tax/RSPT rate = 0.4; government bond rate = 0.05.

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2.3 RSPT

Skipping over the shaded rows, the last two rows of the table illustrate the operation of the RSPT currently proposed by the government. The RSPT follows a proposal originally advanced by Fane and Smith (1997). This can be thought of either as a variant of the PRRT-type tax or as a variant of the joint venture that the Brown Tax represents.

The last two rows of the table follow the first interpretation. Like the PRRT-type tax, the base for RSPT is project revenue less compounded eligible exploration and development costs. But the RSPT differs from the PRRT-type tax in two key respects. The first is that if the project fails so that revenue never exceeds compounded costs (i.e., if the tax base never becomes positive), the government reimburses the investor for a proportion of the net costs that the investor has incurred. The proportion reimbursed is the same as the proportion of net revenues that the government appropriates (i.e., the RSPT rate). The second key difference between the RSPT and the PRRT-type tax is that eligible costs are compounded at the government bond rate (5% in our example), not at an estimated normal rate of return for private-sector investment in the mineral project.

To see how the RSPT is a variant of the Brown Tax, we have to pay attention to the shaded "Loan" rows in the table. A key difference between the RSPT and the Brown Tax is that under the RSPT, the government does not have to put any money up front to pay project costs. This is crucial to the role that the government intends its "reform" of resource taxation to play in its budget strategy. The RSPT is equivalent to a joint venture between the government and the private investor with the government borrowing its share of costs from the private investor, rather than paying it when the costs are incurred. Under the implicit RSPT loan, in year 1 the company is required to provide and the government receives an amount ($40 in our example) equivalent to the government's contribution to project costs under the Brown Tax. Then in year 2 the government repays the loan with interest at the government bond rate. If the project succeeds, this repayment is subtracted from the company's RSPT liability; if it fails, the government pays out in cash. Note that the last two rows in the table can be obtained by summing the "Brown Tax" rows and the (shaded) "Loan" rows.

Note finally, that under the 40% RSPT, the government's expected revenue exceeds 40% of the project's expected rent; it is $18, not $12. The shaded cells in the bottom right-hand corner of the table explain this. Under the RSPT, the government has a $40 exposure to the risks of the project; the normal return to this investment is $8. At the same time, it has paid $2 interest on the implicit

RSPT loan. Once the normal return is subtracted from the government's revenue and the interest added back, we see that the rent that the government has acquired is $12 (i.e., 40% of the project's $30 rent).

3 What's wrong with the prospective RSPT?

As is clear from our example in Table 1, because it is equivalent to a Brown-Tax joint venture plus a compulsory loan, the RSPT essentially converts the company from a 100% mining company to an entity comprising 60% mining company and 40% (compulsory) holder of a new government borrowing instrument (the implicit RSPT bond). It is not clear what appetite financial markets would have for such an entity. Certainly, it is not what the current mining companies want to be. If it is what they wanted to be, they could already have bought the required number of government bonds on the open market.

This would not be a problem if a financial enterprise could be found that is prepared to exchange the mining company's entitlements as holder of the new government borrowing instrument for $40 cash. The company presumably would be able to make such a swap if the implicit RSPT bond were a perfect substitute for a standard government bond. But this is unlikely to be the case.

The government's decision to rely on the implicit RSPT bond suggests that it is not a perfect substitute for a standard government bond from the government's point of view. If it were, then the government could have simplified the RSPT by issuing standard bonds and using the proceeds to pay up front for the 40% of existing and new mining projects that it implicitly acquires under the tax. But this would not have been compatible with the government's budgetary ambitions.

There are several reasons why the holder should regard an RSPT bond as less valuable than a standard government bond with the same face value and interest rate. We list some of the more important reasons.

First, a standard bond represents a legal contract for the government to pay interest and principal to the holder. The RSPT bond represents a policy commitment for the government to pay miners a share of project costs, with interest: if current tax policy persists, the payments will be made. But the RSPT is most likely to require payments, especially cash payouts to miners for the government's share of the costs of failed projects, when the economy is in recession and the budget is under pressure. It is not hard to see why RSPT bondholders might regard it more likely that the government would renege on its RSPT policy commitment than that it would default on its legal commitments on standard bonds.

Secondly, standard bonds pay interest at a fixed rate determined at time of issue, whereas the rate on RSPT bonds is updated annually to reflect the current government bond rate. Hence, holders of RSPT bonds must bear interest-rate risk that holders of standard bonds do not bear.

Thirdly, payment of interest and principal on standard bonds is made on fixed dates, whereas payment dates for RSPT bonds are uncertain and more under the control of the government than the holder. To value such a bond relative to a standard bond, you would have to assess the value to the holder of the implicit bond's being repaid at unknown dates relative to the certain payment dates for principal and interest associated with the standard bond. One possibility is that cash payouts are likely to occur just when the holder of the implicit bond would rather leave their funds accruing interest at the floating government bond rate, i.e., when their other investment prospects are poor and current bond rates are low.

Fourthly, standard government bonds are very liquid – they are readily traded on secondary markets at all times. It is not at all clear that a liquid secondary market for RSPT bonds would develop. Liquid instruments command a premium over illiquid instruments. At times of financial stress, liquidity premiums can be substantial.

Finally, standard government bonds are widely accepted as collateral for other transactions – trading in derivative markets, for example. It seems doubtful that RSPT bonds could fulfil this role.

4 Retrospectivity of the RSPT

Under the government's current plan, the RSPT is to apply to existing projects as well as prospectively to new projects. This arrangement is very like the government buying 40% of existing mining companies. But there are two crucial features of the arrangement under which the government is buying in.

The first is that, rather than paying for its share in cash, the government will pay *via* its new implicit RSPT loan instrument. For the reasons outlined in section 3, this is likely to be worth less than its face value to the company's existing shareholders. The second crucial feature of the retrospectivity of the RSPT is that when it acquires its 40% of existing mining companies the government pays less than the current market price. This is because in calculating a company's RSPT base, the deduction from revenue that is to be allowed is based on depreciation of the historical book value of the company's assets.

If the government just wanted to buy 40% of an existing mining company it could do so by buying 40% of the company's shares on the market. But then it would have to pay the current market value, which is the present value of the

company's expected profits discounted at the company's cost of capital. But this would be of no additional value to the government over the normal rate of return that is required to bear the risk associated with the mining company's activities.

The additional value to the government of the retrospectivity of the RSPT lies entirely in these two crucial features: that it pays less than current market value for the share of the mining companies that it acquires and that it pays with an instrument that is worth less than its face value to the recipient. But the government's gain is matched by a loss experienced by the shareholders of the mining companies. Not all of the current shareholders are foundation shareholders who have benefited from the sharp increase in the profitability that has occurred. If you bought Fortescue shares just before the RSPT proposal materialised, you would incur the RSPT downside without having enjoyed the earlier upside.

5 CGE Modelling

To model the operation of the RSPT literally, a dynamic computable general equilibrium (CGE) framework would be required. This would allow specific details of the government's proposal to be included -- including its calendar timing, the accumulation of eligible costs at specified rates and differentiation between successful and unsuccessful projects. The analysis would be conducted against an explicit base case showing how the national economy (and possibly state economies) might develop over time in the absence of the introduction of the RSPT package. Of particular interest would be to include a recession scenario to explore the implications of the government having to meet obligations to refund costs of failed projects when other macroeconomic developments are already putting pressure on the government budget.

To support its RSPT proposal, the government has relied on much simpler CGE modelling undertaken by KPMG Econtech (2010a). KPMG Econtech used a long-run *comparative-static* methodology. This compares two hypothetical states of the economy in some hypothetical future year: a *shocked* state in which the tax has been introduced and a *base* state in which it has not been introduced. For *long-run* comparative statics, it is assumed that the hypothetical future year is sufficiently distant from the year in which the package is introduced for all variables in the *shocked* case to have adjusted fully to the imposition of the tax. In particular, it is assumed that industries' capital stocks have adjusted fully to the levels that are justified by the post-tax rates of return that they earn with the tax in place.

In comparative-static simulations with CGE models, calendar timing is not explicit. In discussing their estimates of the economic impacts of the RSPT,

KPMG Econtech observes: "For some tax changes, especially changes affecting the taxation of capital, these impacts would take five to ten years to fully develop. Further, this long run focus means that the modelling results abstract from the phasing arrangements included in the Government's response"[3].

Because shocks and responses to them have no explicit calendar timing in comparative-static CGE simulations, there is ambiguity about what is the appropriate *base* state for the economy. KPMG Econtech opts for "a 'normalised' 2009/10 economy"[4]. This "abstracts from any short-term influences on the economy such as the global financial crisis and commodity price fluctuations." and has "terms of trade similar to the level seen in 2005/06". The normalised economy seems to have a structure similar to that of the most recent ABS input-output tables and a scale similar to the 2009/10 economy. Note that there seems to be no attempt to establish a baseline that is a plausible representation of the state that the economy might have in the hypothetical future year sufficiently distant from the year in which the tax package is to be introduced for long-run adjustments to have been made[5].

In the database for its model, KPMG Econtech has split gross operating surplus in the mining industries into components attributable to capital, land and the natural resources. To estimate the capital component, KPMG Econtech applies a "normal" rate of return to the value of capital invested in the industries. KPMG Econtech does not report the estimated normal rates and restrict their documentation to noting that the rates were estimated "using employment data and an estimate of output per employee in each industry".[6]. KPMG Econtech has declined our subsequent requests for the rate-of-return data or for detail that would allow us to replicate their estimation method.

With returns to natural resources separately identified in this way, KPMG Econtech is able to tax those returns directly. The supply of natural resources is assumed to be fixed in the KPMG simulations; hence, the returns are a pure rent and the tax is a pure rental tax that, by assumption, imposes no excess burden. Taxing rent just reduces the pre-tax price of natural resources.

KPMG Econtech's reporting of the simulations contains no indication that the simulations were configured in a way that allows many of the general equilibrium mechanisms that CGE models usually highlight. There is no discussion, for example, about what was assumed about foreign ownership of mining companies

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3 KPMG Econtech (2010a), p. 33.

4 KPMG Econtech (2010a), p. 10-11.

5 The government plans to introduce the RSPT in 2012. Accepting the KPMG Econtech speculation about the likely length of the long-run adjustment period, the hypothetical future year would lie somewhere in the period 2017 to 2022.

66 KPMG Econtech (2010b, fn9).

that are to be liable for the RSPT[7]. This could be important for the general equilibrium macroeconomic effects of the tax. Taxing foreign owners would mean that income that would have been remitted overseas would be retained in Australia. This would reduce the trade surplus that Australia would need to run to finance income payments to foreign owners. In turn, this would tend to strengthen the Australian exchange rate, with implications for the competitiveness of trade-exposed industries.

It is not clear why the government chose to rely on long-run comparative-static analysis of a pure rent tax rather than attempt a realistic dynamic analysis of the sophisticated tax that it has actually proposed. In response to questions from Senator Xenophon at a recent Senate Committee hearing, the Secretary to the Treasury suggested that more realistic modelling was infeasible. But this does not sit well with the modelling that the Treasury relied on to support the government's CPRS emissions-trading proposal. That modelling, undertaken principally by the Centre of Policy Studies at Monash University, used a dynamic specification with the potential to provide deeper insights than the very limited light that the KPMG Econtech modelling was able to throw on the likely economic consequences of introducing the RSPT in Australia

6 Conclusion

Our analysis of the RSPT suggests several issues that should be addressed in more detail.

The first issue is to determine the rate of interest that is appropriate for a loan instrument with the characteristics of the implicit RSPT bond. Our approach to this would be to price the RSPT relative to a standard government bond. Quantitative bond valuation is a specialised field of finance – you can win Nobel prizes for success at it.

The second issue is to assess whether or not it is appropriate to assume that the mining sector faces no constraints on the availability of capital. This assumption is implicit in the basic proposition that a pure rent tax would not distort investment decisions. But it does not describe the environment in which the mining companies appear to think they operate. Perceived capital constraints may in fact relate to constraints on the managerial capacity available to companies in applying new funding to additional projects.

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7 As was the case for their normal-rate-of-return estimates, KPMG Econtech has declined our requests for meaningful clarification on this point.

The third issue is to assess whether it is appropriate to apply the RSPT to existing projects as well as to new projects. This seems to be more a matter of equity in relation to achievement of the government's budget strategy than an issue relating to the RSPT as a contribution to tax reform. As we argued in section 4, the tax dividend available to the government from applying the RSPT to existing projects depends on the government paying less than the current market price for the share of existing projects that it implicitly acquires when it imposes the RSPT on existing projects. This tax dividend implies losses for the current shareholders of mining companies whether or not they participated in the unexpected upside that the mining industry has enjoyed in recent years. It is not clear that equity demands that the extent of ownership of mining stocks is the appropriate indicator of the contribution that a citizen should be required to make to the attainment of the government's budget strategy.

The final issue that we will list relates to the information that the community needs to enable it to make sensible judgements about whether the RSPT represents sound public policy. In section 5, we outlined the inadequacy of the KPMG Econtech modelling upon which the Treasury relied. Drawing on recent advances in modelling techniques, we could undertake much more useful modelling of the economic effects of the RSPT.

There are numerous issues relating to the RSPT that we have not addressed in this note. One is the implications for the State economies of the proposal and for State governments' ability to adjust mining royalty rates. Given the geographic concentration of the mining industries, it would be useful to model the state and sub-state regional effects of the proposal. Modern modelling techniques would allow this.

The Henry review recommended that the RSPT should replace State royalties, with State governments to be compensated by allocation of shares of the RSPT revenue – much as shares of GST revenue are allocated to currently. The possibility of constitutional challenge discouraged the Commonwealth from accepting that recommendation. Instead, it intends to refund to mining companies the State royalties that they have paid. But this intention will not apply to all increases in royalties that States may attempt to impose. Rather than giving State governments more scope to adjust royalty rates, the RSPT regime is likely to constrain their scope to increase royalty rates. This is because the extent to which companies cannot pass on increases to the Commonwealth will be more obvious than now is the extent to which companies can hand on increases to their customers.

Finally, we have said very little about practical implementation issues surrounding the RSPT – these include the accounting that George Fane claims is too hard for economists. One is transfer pricing. As is currently the case for many State royalties, the Commonwealth intends to levy the RSPT on the profitability of mining projects assessed at mine-gate or well-head prices. In the case of vertically

integrated extraction/processing companies, this requires determination of prices that are not market-observed.

7 Postscript: changes announced on 2 July

At the beginning of this note, we identified two features of the proposed RSPT as the miners' main grievances: the 40% tax rate and the application of the tax to existing, as well as new, projects. The changes to the resource-taxation regime announced by Julia Gillard on 2 July 2010 address both these grievances. They also retreat from the novel design feature of the RSPT: rather than being a combination of a Brown Tax and a loan from the mining company to the government, the new Minerals Resource Rent Tax (MRRT) has the same structure as the PRRT. Another important change is that the MRRT is to be applied only to a narrow range of minerals, not universally as was the case for the RSPT. Finally, the government has affirmed that its intention is that the amended resource-rent taxes will apply to profits assessed at the mine-gate or well-head value of the minerals. This raises transfer-pricing problems in the case of minerals that are extracted and processed by vertically integrated miner/processors.

In the rest of this postscript, we will comment briefly on each of these aspects of the changes. Finally, we will explain the implications of the changes for the Treasury's KPMG Econtech modelling of resource rent taxation.

7.1 The tax rate

The RSPT rate was to have been 40%. Under Gillard's changes, the RSPT is to be replaced by the MRRT levied on coal and iron ore at a rate of 30%, with onshore oil & gas developments to be made subject to the existing PRRT at its current 40% rate. There is to be no new resource rent tax levied on other minerals (i.e., for minerals other than coal, iron ore and oil & gas, the proposed rate of resource rent tax has been reduced from 40% to 0).

7.2 Retrospectivity

The RSPT was to have applied to profits from existing mining projects as well as to new projects. To determine their liability for tax on existing projects, the miners were to be allowed to claim depreciation on the historical book value of their relevant assets, not on the current market value. Under the MRRT, miners will have the option of claiming depreciation on the market value of their assets (as at 1 May 2010) or on the historical book value. But for the market-value option a long depreciation period (up to 25 years) will apply and there will be no

uplift to the market value applied. (The conventional role of such uplifts in resource rent taxation is to ensure that only returns in excess of normal, risk-adjusted, returns are taxed.) For the historical-book-value option, assets can be depreciated over five years and an uplift rate of the bond rate plus 7% will apply.

No doubt companies' CFOs will be furiously calculating which option is the more valuable for their companies. As a rough rule of thumb (and assuming that the government bond rate is expected to remain constant at 6% over the relevant depreciation periods) the ratio of the book value of a company's assets to the market value as at 1 May 2010 would have to be about 0.3 for the company to be indifferent between the two options; any more than 0.3 and the market-value option is preferable, any less and the historical-value option wins.

By insisting that depreciation of current market value is spread out over a long period, the government ensures that the MRRT will raise substantial revenue in early years, whichever option companies choose. This is important to the contribution that resource rent taxes make to the government's budget strategy, even after the recent changes to Rudd's original proposals.

7.3 The design

As explained in section 2.3 of this note, the originally proposed RSPT is equivalent to a 60/40 joint venture between the mining company and the government (a Brown Tax) combined with a compulsory loan from the company to the government. The loan would have allowed the government to contribute its 40% of project costs without putting money up front. Under the RSPT the loan would always have been repaid (with interest at the government bond rate), whether or not the project eventually earned taxable profits. This RSPT design feature would have ensured that the government shared in the downside of failed projects as well as the upside of successful ones. In theory, it should have avoided what Ben Smith called the "impossibility of a neutral resource rent tax".

With the changes announced on 2 July, the government has abandoned this novelty and reverted to the design of the existing PRRT, which is explained in section 2.1. Under this design, the government taxes profits in excess of an estimate of miners' cost of capital but makes no contribution to the costs of failed projects. Onshore oil & gas projects are to be brought into the existing PRRT regime that is currently applied to offshore oil & gas projects. Coal and Iron Ore projects are to pay the new MRRT, which has the same design as the PRRT but a lower rate. From the point of view of the coherence of the tax system over all, it does seem to make sense to have all oil & gas projects subject to the same tax regime. But it is not clear that applying different regimes to different extractive industries is appropriate.

7.4 The range of application

The RSPT was to have applied to all mineral projects. This is consistent with the aim of the Henry tax review to increase the overall coherence of the Australian tax system and with the primary motivation offered by the government for the RSPT, i.e., to increase the community's share of profits attributable to mineral deposits that are owned by the community.

With the changes announced on 2 July, the government has narrowed the application of resource rent taxation to oil & gas, coal and iron ore. Other minerals are not to be subject to resource-rent taxation and the rate of taxation for oil & gas projects is to exceed that applying to coal and iron ore.

7.5 Transfer pricing

Many resource taxes, including the new MRRT, are assessed on tax bases that depend on the mine-gate or well-head value of the relevant resource. It is frequently the case that a vertically integrated enterprise undertakes both the resource extraction and the processing of the extracted resource. In such cases, transfer of the extracted resource from the extraction arm to the processing arm of the enterprise is an internal transaction that does not have an observable market price.

To establish the resource-tax liability of such a vertically integrated enterprise requires the estimation of mine-gate or well-head prices for the relevant resources. The usual practice is to estimate the prices that would eventuate if the extractor and the processor were independent enterprises negotiating arms-length prices for extracted resources.

Our approach to estimating such arms-length prices would be first to establish lower and upper bounds. The lower bound would reflect the extractor's costs – in an arms-length market, we would not expect the extractor to accept less than what it cost to get the resource to the mine gate or well head. The upper bound would be the market price of the processed resource *less* the processor's costs – in an arms-length market, we would not expect the processor to be prepared to pay more than this.

In most cases, there will be a gap between the lower bound and the upper bound. This gap represents profits that are available to be shared in some way between the extractor and the processor. Where in the gap the price would fall in an arms-length market will depend on the relative bargaining powers of the extractor and the processor. Our approach would be to apply game-theoretic techniques to estimate the arm-length shares of the gap.

7.6 Implications for the KPMG Econtech modelling

The design of the new MRRT and existing PRRT looks a lot more like the resource rent tax that KPMG Econtech implemented in its modelling than does the RSPT. As explained in section 5, the modelling relied on identifying normal rates of return for the mining industries and then taxing returns in excess of normal returns. These excess returns were assumed to be the reward (rent) received factors (mineral deposits) that could be used only in producing minerals.

For the MRRT, the analogue of KPMG Econtech's normal rates of return is the uplift rate - the bond rate plus 7%. Presumably this is not the same as the normal rates of return estimated by KPMG Econtech, although, as noted in section 5, KPMG Econtech has declined to disclose details of their estimates that would allow us to check this. The KPMG Econtech modelling depends on ensuring that the new tax is applied only to the returns to (immobile) mineral deposits and not to the (potentially mobile) capital and managerial expertise that is required to extract minerals from the deposits. If the MMRT uplift rate is less than KPMG Econtech's estimated normal rates of return for coal and iron-ore mining, then imposing the MMRT in KPMG Econtech's model would presumably involve taxing the returns to other inputs to the mining process as well as to the rents accruing to the deposits. In this case, the modelling would presumably not indicate that the MRRT imposed no excess burden. If the MMRT uplift rate matched KPMG Econtech's estimated normal rates of return, then presumably the results of the modelling would be impervious to the recently announced changes to the tax regime.

As indicated in section 5, we did not regard the KPMG Econtech modelling as an adequate representation of the wider economic effects of the RSPT. Our preferred approach would be to model the effects of resource rent taxes in a dynamic framework, to include a wider range of general-equilibrium effects than KPMG Econtech appears to have allowed for and to identify state-level effects as well as national-level effects. Some of the features of the RSPT that made us think that a dynamic approach was especially important have been eliminated by the recently announced changes to the taxation regime. Nevertheless, the static methodology employed by KPMG Econtech falls short of best practice in CGE modelling. We would use a more modern approach with the potential to give richer insights into the effects of the tax reform: both long-run and intermediate.

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