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**TAXATION REFORM OPTIONS FOR THE PETROLEUM, GAS AND MINING
INDUSTRIES IN PAPUA NEW GUINEA**

by

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This paper concerns petroleum, gas and mining taxation reform options for Papua New Guinea (PNG). The paper is based on research for a presentation to the National Research Institute of Papua New Guinea sponsored 'Taxation Research and Review Symposium' in Port Moresby, May 2014. Feedback from the conference delegates has been incorporated herein. The paper comprises sections on: socio-economic trends for PNG natural resources; tax law for petroleum, gas and mining; theoretical approaches to petroleum, gas and mining taxation; concerns with PNG's natural resource taxation; global trends in natural resource taxation; options for tax reform; and recommendations for tax reform. The summary list of petroleum, gas and mining taxation reform recommendations for PNG follows.

For all future petroleum and gas developments

General petroleum and gas legislation, comprising:

- Company income tax at the generally prevailing rate (currently 30 per cent);
- Ad valorem royalty at the rate of 2 per cent; and
- An Additional Profits Tax (APT) at a single rate modelled on the Australian Petroleum Resource Rent Tax (PRRT).

Stability clauses

- Fiscal stability clauses should be removed.

Petroleum and gas agreements

- Continuation of petroleum and gas agreements but with fiscal terms taken out and included in the general legislation.

State equity participation

- A preference for state equity participation to be replaced by the APT.
- If state equity participation is to be retained, it should be on fully commercial terms identical to those of private equity participants.
- If state equity participation is not on fully commercial terms, it should be regarded as effectively another tax on rent, with the rate of APT adjusted downward accordingly.

Allocating exploration acreage

- Cash bidding for unallocated, relinquished and surrendered exploration acreage.

Geological survey work

- The PNG government to contract out early-stage geological survey work, financed out of proceeds of cash bidding for exploration acreage.

For all existing petroleum and gas developments

- Exploration expenditure anywhere in PNG to be deductible against assessable income from operating projects; and
- Undeducted exploration to be carried forward at a low accumulation rate.

For all future mining developments***General mining legislation, comprising:***

- Company income tax at the generally prevailing rate (currently 30 per cent);
- Ad valorem royalty at the rate of 2 per cent; and
- An Additional Profits Tax (APT) at a single rate modelled on the Australian Petroleum Resource Rent Tax (PRRT).

Double deduction for exploration

- The double deduction for exploration should be removed.

Stability clauses

- Fiscal stability clauses should be removed.

Resource development agreements

- Continuation of resource development agreements but with fiscal terms taken out and included in general legislation.

State equity participation

- A preference for state equity participation to be replaced by the APT.
- If state equity participation is to be retained, it should be on fully commercial terms identical to those of private equity participants.
- If state equity participation is not on fully commercial terms, it should be regarded as effectively another tax on economic rent, with the rate of APT adjusted downward accordingly.

Allocating exploration acreage

- Cash bidding for unallocated, relinquished and surrendered exploration acreage.

Geological survey work

- The PNG government to contract out early-stage geological survey work, financed out of proceeds of cash bidding for exploration acreage.

For all existing mining developments

- Removal of the double deduction for mining exploration for company income tax purposes.
- Consideration to be given to entering into discussions with the Ramu nickel project operators about the tax holiday and exemption from import duties.

1. SOCIO-ECONOMIC TRENDS FOR PNG NATURAL RESOURCES

1.1 Natural gas and liquefied natural gas (LNG)

Papua New Guinea (PNG) is situated in the Asia-Oceania region where competition for project capital requires governments to apply competitive fiscal arrangements within a predictable and stable tax regime. Figure 1 shows that although PNG has viable proven reserves of natural gas there are large reserves elsewhere in the region. PNG needs to attract investment in the infrastructure required for natural gas production and processing for the export of liquefied natural gas (LNG).

Figure 1: Proved Reserves of Natural Gas (trillion cubic feet)

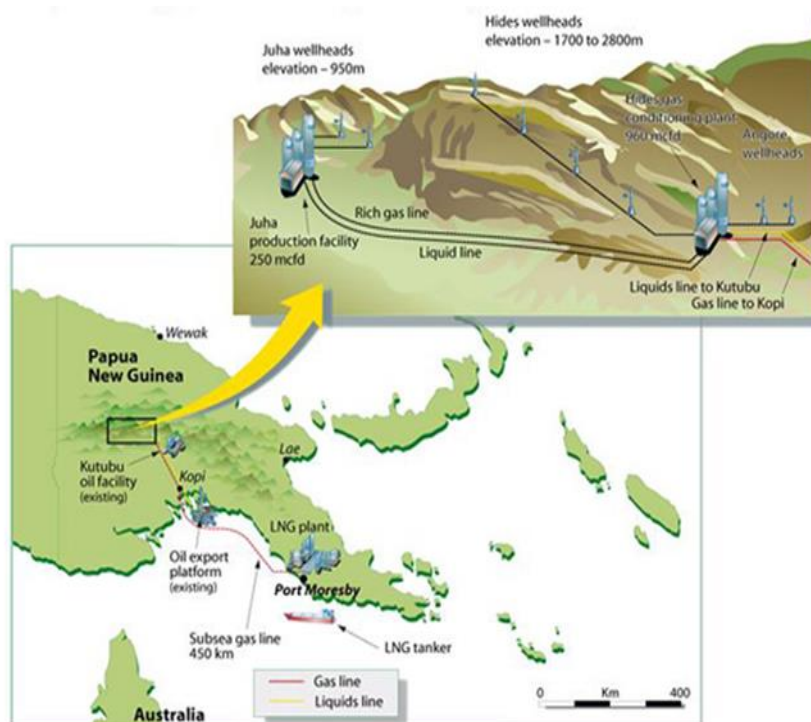
Selected countries (Asia and Oceania)			
		2013	World ranking
Australia		43	27
Brunei		14	33
Burma (Myanmar)		10	39
Malaysia		83	15
Papua New Guinea*		9	46
Indonesia		108	11
Source: US Energy Information Administration			
http://www.eia.gov/countries/country-data.cfm?fips=pp.			
* Oil Search Ltd			
http://www.oilsearch.com/			

Construction success of the \$20 billion PNG LNG project, which is developing the Southern Highlands and Western Provinces' gas fields, has captured the attention of the international petroleum and gas industry and encouraged further exploration for natural gas reserves in PNG¹ Recent reports claim there are now over 70 live petroleum prospecting licences in PNG ([PNG Chamber of Mines and Petroleum 2014](#)). These licences cover most of the petroleum prospective areas and there is a backlog of applications.

In 2014 a major construction phase concluded for the PNG LNG project with the completion of an onshore pipeline for transporting natural gas from the Hides gas conditioning plant to the Omati River. As shown in Figure 2, the pipeline connects to an offshore section of pipeline that runs to the new LNG plant located near Port Moresby. The first shipment of LNG occurred in late May 2014, well ahead of schedule.

¹ The natural gas for the PNG LNG project is from the Hides, Angore and Juha fields.

Figure 2. PNG LNG Project



Source: Exxon Mobil PNG Ltd (2014).

The PNG LNG project is expected to produce 6.9 million tonnes per annum for around 30 years and the co-venturers have contracts to sell LNG to the Asian markets of China, Japan and Taiwan.²

The tax arrangements for the project were settled in 2008 when the PNG LNG project participants formally signed a Resource Development Agreement that established the fiscal regime and legal framework by which the project is to be regulated and set the terms for state equity participation in the project. The PNG LNG project commercial co-venture partners are Esso Highlands Ltd (the operator), Oil Search Ltd, Santos Ltd and JX Nippon Oil & Gas Exploration. These entities, which are part of trans-national corporations (TNCs), will be the main taxpayers of gas-related taxes. The project's state venture partners are National Petroleum Company of PNG Limited (PNG government), Mineral Resources Development Company Limited (PNG landowners) and Petromin PNG Holdings Limited.³ Oil Search has

² See, ExxonMobil PNG Limited 2014, "Onshore Pipeline Complete," <<http://pnglng.com/project/>>.

³ Esso Highlands Ltd is the project operator and a subsidiary of the Exxon Mobil Corporation. The NPCP is a wholly owned subsidiary of Independent Public Business Corporation of PNG (IPBC), which is a 100% State-owned company. JX Nippon Oil & Gas Exploration is a 100% subsidiary of Nippon Oil Corporation. The MRDC is a 100% state-owned company. MRDC concentrates entirely on landowner equity interests in both mining and petroleum projects. Petroleum Resources Kutubu Limited and Petroleum Resources Gobe Limited each hold direct interests in the Project and are both 100% owned subsidiaries of MRDC. Petromin PNG Holdings Limited is an independent company created by the State of Papua New Guinea to hold the State's assets and to maximise indigenous ownership and revenue gains in the petroleum and mining sectors. Eda Oil Limited is 100% owned by Petromin PNG Holdings Limited, an entity directly owned by the PNG Government to hold its interests in petroleum and mining resource projects, <<http://pnglng.com/project/>>.

a separate strategy to expand the PNG LNG project by utilising its licence on gas reserves in the Papuan foldbelt and Southern Highlands Province.⁴

Key social issues arising from the PNG LNG project are those of resettlement, claims for compensation and mineral ownership, and security of project personnel.⁵ Unemployment increases due to redundancies linked to the completion of the LNG construction phase compounds these social issues.

A report commissioned by the ANZ Bank concludes that PNG's resources sector is set for significant growth over the next 20 years, but to achieve this end, inter alia, capital inflows for resource projects are needed. The report points out that part of the perceived risk for investors is the relationships with landowners. It claims that good outcomes could follow if the customary landowners were respected, paid fairly for natural resources and provided with training opportunities ([Port Jackson Partners 2013](#)). Other more structured processes for managing customary landowner risk include the Involuntary Resettlement Policy, which the World Bank claims will enable developers to take a consistent approach to audit the resettlement and compensation issues faced by affected communities ([Minerals Resources Authority of Papua New Guinea 2014, pp. 1, 4](#)).⁶

Other recent PNG natural gas activities include the plan by Inter Oil to develop a second LNG project from its gas discoveries at Elk and Antelope fields of the Gulf Province. In May 2014 Inter Oil completed a sale of an interest with co-venturer, Total SA. Both are TNCs.⁷ The PNG government and landowners have the option to exercise their rights to take a 22.5 per cent interest in this expanded project.⁸

Horizon Oil holds petroleum exploration licences for the forelands of Western Province. Horizon Oil operates the exploration and appraisal program for the Stanley condensate project. Gas condensate will be recovered and then exported; and the second product, natural gas, will be sold for domestic use, with unsold gas re-injected into a reservoir for later sale. The development project is a joint venture between Horizon Oil and two TNCs: Talisman Energy, and Mitsubishi and Osaka Gas. Talisman and Mitsubishi are working closely together with a view to aggregating their natural gas fields, with the goal of LNG export. The PNG government holds an option to participate in the Stanley project at 22.5 per cent. The supply of natural gas to rural areas in Western Province is the key social objective ([PNG Chamber of Mines and Petroleum 2014](#)).⁹

⁴ See, Oil Search 2014, "PNG LNG Project Overview," <<http://www.oilsearch.com/Our-Activities/PNG-LNG-Project/PNG-LNG-Project-Overview.html>>.

⁵ See ExxonMobil PNG Limited 2013, "Principles on Security and Human Rights"; and ExxonMobil PNG Limited 2013, "Resettlement Implementation Process," <<http://pnglng.com/project/>>.

⁶ See also, World Bank, Involuntary Resettlement Policy, <<http://www.worldbank.org/>>.

⁷ See Inter Oil Press Release 2013, "InterOil Selects Total SA for PNG Gas Development"; Inter Oil Press Release 2014, "Elk-Antelope Joint Venture Operating Agreement"; and "InterOil 2014 First Quarter Results", 14 May 2014, <<http://www.interoil.com/>>.

⁸ See eg., Winning, D and Kelly R 2013, "Total, InterOil agree to develop natural gas fields in Papua New Guinea," <<http://online.wsj.com/news/articles/SB10001424052702303997604579240970379973560>>.

⁹ See also Horizon Oil 2013, "Activities and Operations: Papua New Guinea," <<http://www.horizonoil.com.au/activities-operations/default.php>>.

1.2 Crude oil

Figure 3 shows that in the Asia-Oceania region, PNG is not a significant net exporter of crude oil when compared to Indonesia and Vietnam. PNG's crude oil production is from the mature fields of Kutubu, Gobe, and Moran.¹⁰ From a resource tax revenue perspective this income stream is minor.

Figure 3. Crude Oil Proven Reserves (billion barrels)

Net export countries of crude oil (Asia and Oceania)	
	<u>2013</u>
Australia	1.4
Brunei	1.1
Indonesia	4.0
Malaysia	4.0
New Zealand	0.1
Papua New Guinea *	0.2
Philippines	0.1
Thailand	0.5
Vietnam	4.4
Source: US Energy Information Administration	
http://www.eia.gov/countries/country-data.cfm?fips=pp .	
* Oil Search Ltd	
http://www.oilsearch.com/	

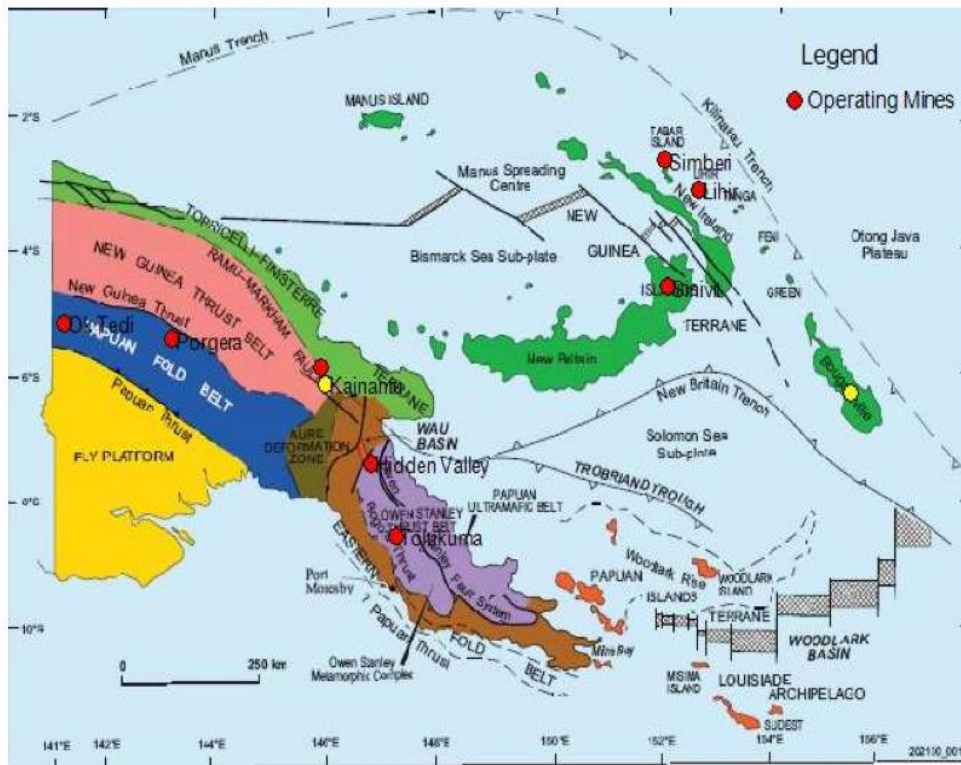
1.3 Mining

PNG has a number of world-class mineral deposits comprising mainly gold, copper and zinc ([Bourassa and Turner 2013, p.144](#)). Mining activity in PNG centres on gold, silver, and copper, although exploration for other minerals, in particular chromite, nickel, iron, platinum group-metals and industrial minerals, has become more prolific ([Bourassa and Turner 2013](#)). Currently, PNG hosts eight operating mines; one a recently commissioned nickel mine, and the remainder being gold mines — with some copper and silver by-products. The locations of the mines are shown in Figure 4. The copper and gold mines at Bougainville Island, once operated by Bougainville Copper Ltd (a subsidiary of Rio Tinto), are being subjected to scrutiny about the possibility of their re-opening. The Bougainville mines are claimed to be potentially among the largest in the world. The company wants its production lease renewed and the mine reopened, which has been idle since the military conflict in 1989.¹¹ The mine re-opening issue will be compounded by Bougainville islanders' vote on independence in 2015.

Figure 4. Operating mines in PNG

¹⁰ Production for the year 2013 for Kutubu was 18.7 million barrels, Gobe 0.2 million barrels, both operated by Oil Search Ltd; and Moran 13.9 million barrels, which is operated by Esso Highlands Ltd and Oil Search in separate licence areas, <http://www.oilsearch.com/>.

¹¹ See AGM Notice for 6 May 2014, Bougainville Copper Ltd, <http://www.asx.com.au/asx/research/companyInfo.do?by=asxCode&asxCode=BOC#headlines>.



Source: (Mineral Resources Authority of Papua New Guinea 2012, p.3) <<http://www.mra.gov.pg/Portals/2/Publications/Bulletin/julydec2012/Issue%202.pdf>>.

The 2012 production from mining in PNG is shown in Figure 5 below.

Figure 5. PNG Mining Production, January–December 2012

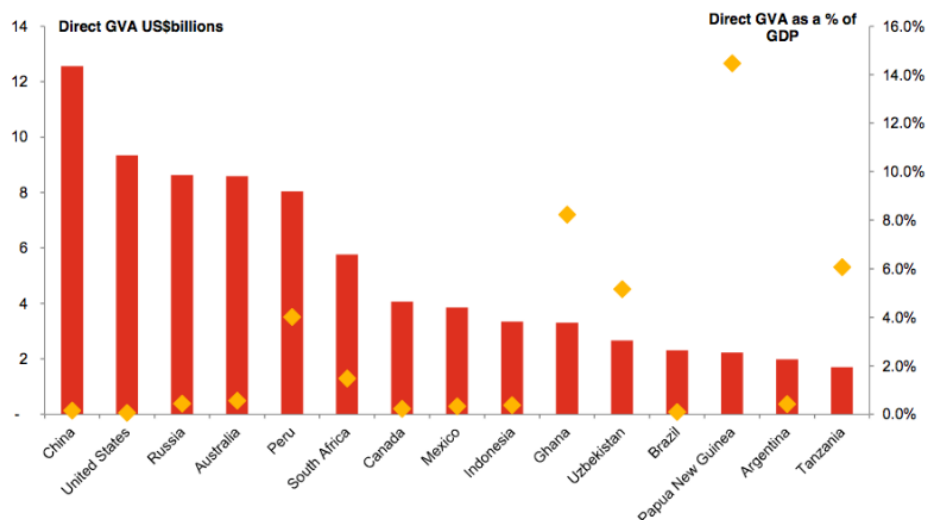
Mine	Production: Jan-Dec 2012					
	Copper (tons)	Gold (Oz)	Silver (Oz)	Nickel (tons)	Cobalt (tons)	Chromium (tons)
Ok Tedi	125348	405730	822351	-	-	-
Newcrest Lihir	-	589029	-	-	-	-
Porgera	-	440304	90130	-	-	-
Tolukuma	-	21612	47445	-	-	-
MMJV	-	159784	1643193	-	-	-
Simberi	-	56678	10214	-	-	-
Sinivit	-	2134	1538	-	-	-
*Ramu *December only, first export	-	-	-	4758	473	3630
Small Scale Mining PNG		95,799				

Source: Mineral Resources Authority (MRA) of PNG (2012, p. 3) <<http://www.mra.gov.pg/Portals/2/Publications/Bulletin/julydec2012/Issue%202.pdf>>.

Figure 6 depicts the gross value added (GVA) from gold production in a range of countries, expressed as a percentage of GDP — which is just under 16 per cent in the case of PNG

(Price Waterhouse Coopers 2013, p.3).¹² The high-yielding gold industry sustains a workforce of over 16,000 employees in PNG, but the PNG economy is not as diverse as many of the countries itemised in Figure 6. Thus the PNG government should scrutinise the taxation levels of gold, given the level of its GVA, as the tax take could improve (as discussed at section 1.4.1).

Figure 6. Direct gross value added (GVA) by gold mining, selected countries (2012)



Source: (Price Waterhouse Coopers 2013, p. 3)

<http://www.gold.org/download/private/PWC_direct_economic_impact_of_gold.pdf>.

Figure 7 shows that PNG's main producing mines are owned and operated by trans-national corporations (TNCs), except for the Tolukuma gold mine and the Ok Tedi copper/gold mine in the Western Province. When the Ok Tedi mine was handed back to the Government by BHP, it was expected that it would close down within a relatively short time. But with the past decade's resource boom, Ok Tedi became very profitable again. It is now PNG's largest mine and revenue earner. In 2011, it paid K1.2 billion in tax.¹³

Figure 7. PNG's Operating Mineral Mines and Leaseholders

Mineral Mine	Type	Leaseholder	TNC*
1 Ok Tedi	copper/gold/silver	PNG state	-
2 Lihir Newcrest	gold/silver	Newcrest Mining Ltd	Y
3 Porgera	gold/silver	Barrick Gold Corporation	Y
4 Tolukuma	gold/silver	PNG state: Petromin PNG Holdings	-
5 Morobe Mining Joint Ventures (MMJV)	gold/silver	Newcrest 50%/Harmony Gold 50%	Y
6 Simberi	gold/silver	St Barbara Ltd	-
7 Sinivit	gold/silver	New Guinea Gold Corporation	Y
8 Ramu	nickel/cobalt/chromium	China Metallurgical Corporation (MCC) 70% + others	Y

* TNC: a trans-national corporation

Source: Company reports

¹² Gross value Added (GVA) measures the contribution to gross domestic product (GDP), employment and taxes paid.

¹³ See eg. <<http://www.abc.net.au/news/2013-09-19/png-government-takes-control-of-png-ok-tedi-mine/4967004>>.

Ok Tedi is the largest and longest operating mine in the country and epitomises both the windfalls and challenges that mining brings to PNG. The social benefits of the mine are claimed to be the training and education of ‘over a thousand tradesmen and women and university graduates’ (MRA of PNG 2012, p. 3). However, social and environmental problems plague this mine, and these have adversely affected tax revenue.

Lobby groups point out the long and complex history of environmental issues associated with mining in PNG.¹⁴ Most issues relate to the poisoning of waterways by riverine tailings disposal. Tailings disposal by BHP during the 1980s-90s caused destruction of the Ok Tedi River ecology and adversely affected downstream villages that use the river as their primary water source.¹⁵ In 2002, BHP, then the major shareholder and operator, divested 63 per cent of its Ok Tedi shares to a charitable trust, the PNG Sustainable Development Program (SDP), to help affected communities; with the state owning the rest of the shares. In return, BHP was granted legal immunity from liabilities relating to environmental damage. Remediation of the tailings-polluted land and ecosystem is ongoing and costly. In September 2013, the PNG parliament passed legislation that canceled the state’s shares, and issued new shares to the state, giving it complete ownership. Legislation was also passed to remove the legal immunity from liability that BHP had negotiated upon departure ([IMF 2013, p.16-17](#)).¹⁶

Social and environmental issues are prevalent in other PNG mining ventures. The Lihir mine, one of the world’s largest known gold deposits, suspended operations briefly in 2012 due to traditional landowners’ protests over inadequate benefits for locals. More recently, in March 2014, workers’ protests for better working conditions resulted in suspended production at MMJV’s Hidden Valley gold mine.¹⁷ MCC, the operator of the recently commissioned Ramu nickel mine, has faced ongoing court challenges by landowners over the practice of submarine tailings disposal (STD) into Basamuk Bay (MRA of PNG, p. 31).¹⁸ It is claimed that STD results in loss of habitat and associated organisms in a tailings area. High concentrations of heavy metals can adversely affect fish communities and the human populations that depend on them.¹⁹ PNG is earthquake-prone and subject to high rainfall, which raises serious issues in the control of run-off from mines. The issue of cost recovery for mine tailings disposal and rehabilitation is outside the scope of this paper.

1.4 Trends in PNG tax revenue

In PNG, mineral, petroleum and gas resources are owned by the state on behalf of the people. However, as with many developing countries, PNG lacks the domestic capital to develop these resources, and relies instead on foreign investment, technology and expertise. Extractive industry projects tend to operate as enclaves, especially in developing countries, with limited non-fiscal benefits for the host nation. The intention in PNG has been to utilise

¹⁴ A lobby group example is the Mineral Policy Institute, an ‘international civil society organisation with a volunteer board’, see <http://www.mpi.org.au/our-work/papua-new-guinea/>.

¹⁵ See eg. ‘Radio and Current Affairs Documentary: Ok Tedi’, Radio National Australia, transcript, <http://www.abc.net.au/radionational/programs/currentaffairsspecials/ok-tedi/4434570>.

¹⁶ See also ‘Ok Tedi immunity gone, with implications beyond BHP’, October 2013, <http://www.miningaustralia.com.au/news/ok-tedi-immunity-gone-with-implications-beyond-bhp>.

¹⁷ Eg. ‘Newcrest restarts Lihir Mine’, August 2012, <http://www.mining.com/newcrest-restarts-lihir-mine-operations-69052/> and ‘Hidden Valley Mine temporarily suspends operations,’ March 2014, <http://ramumine.wordpress.com/2014/03/21/hidden-valley-mine-temporarily-suspends-operations/>.

¹⁸ See also ‘New \$1.5 billion nickel mine can start dumping waste in PNG ocean’, July 2011, <http://www.mining.com/new-1-5-billion-nickel-mine-can-start-dumping-waste-in-png-ocean/>.

¹⁹ See eg. ‘Overview of Mining in PNG’, 2013, <http://www.mpi.org.au/our-work/papua-new-guinea/>.

revenue from the sector to drive broader economic growth.²⁰ Past resource booms in PNG have created the so-called *Dutch disease* — a two-speed economy, which means the expansion of the minerals sector has ‘not benefited the population as widely as expected, with much of the resource revenues wasted’ ([IMF 2013, p. 15](#)).

1.4.1 The tax take

The overview of key projects has shown that PNG is a competitor country in the Asia-Oceania region for LNG exports to China, Japan and Taiwan, while PNG’s mining activities need to be economically viable to secure investor capital. Government strategies to attract capital inflow should observe investors’ key considerations, which include the general factors of resource prospectivity, fiscal regime, sovereign risk, prevalent debt to equity ratios, labour, infrastructure, security of operations, issues surrounding corruption, and environmental and social concerns. These factors need to be considered and ranked in terms of degree of importance to investors into PNG, and by project, given the potential impact of such perceptions on PNG government ‘tax take’ (tax revenue as a proportion of GDP) for mineral resources.

The 2013 International Monetary Fund (IMF) staff report on PNG calls for an ‘enabling environment for sustained, inclusive growth in the post-boom era’ ([IMF 2013, p. 1](#)). The IMF’s consultation with PNG officials and statistical analysis produced a report that reveals that for the past 10 years ‘PNG has achieved strong economic growth (averaging 6 per cent per annum), supported by high commodity prices, large mineral investment inflows, sound macroeconomic policies, and a healthy banking sector’ ([IMF 2013, p. 3](#)). It notes that in the longer term, shale gas development around the world could reduce LNG prices, exerting pressure on government revenue, export earnings and the kina’ ([IMF 2013, p. 4](#)). This situation could be further exacerbated by private sector debt (the majority of which is debt owed by LNG project partners) that reached around 120 per cent of GDP in 2012. The debt could pose a risk to profitability because of the risk of declining LNG prices (IMF 2013, pp. 4, 13).

The IMF’s 2013 staff report on PNG promotes the aim of the PNG government to increase revenue over time and ‘improve transparency in the management of resource revenue...’([IMF 2013, p. 1](#)). ‘The authorities will need to ... rationalize tax exemptions and concessions, particularly given the expected moderate increases in mineral revenues from the LNG project over the project life.’ In particular, ‘authorities should aim to increase the progressivity of PNG’s resource revenue regime – moving toward less reliance on dividends from state equity shares and more on rent-based taxes – and remove some of the tax incentives, such as income tax holidays and the double deduction for exploration...and restrict tax exemptions’ ([IMF 2013, pp. 8-9](#)).

1.4.2 PNG revenue data

The IMF notes the shortcomings in PNG’s collection and compilation of data to construct fiscal accounts, although some data was adequate for a broad surveillance. The PNG Treasury has been estimating National Accounts data since 2002. Central government tax revenue data is deficient. The data associated with the major presence of TNCs in the mining

²⁰ Mineral Policy Institute 2013, “Overview of Mining in PNG, Mineral Policy Institute”, <<http://www.mpi.org.au/>>. See also IMF (2013).

and petroleum sector, such as the International Transactions Reporting System (ITRS), is ‘not tightly monitored’ and differences exist in import/export data between official and trading partner sources. There are ‘major deficiencies in reporting private external debt and foreign direct investment.’ In 2013 PNG was a beneficiary of a Japanese external sector statistics project to address this issue, with more projects planned ([IMF 2013, pp. 10-11](#)).

Figure 8 shows the tax take of mineral revenue as a percentage of GDP. PNG’s mineral revenue as a share of GDP is expected to be relatively constant at around 3.4 per cent.

Figure 8. PNG Mineral Revenues and GDP

	2009	2010	2011	2012	2013*	2014*
PNG mineral revenue (% of GDP)	3.7	6.7	7.4	3.4	3	3.4
PNG non-mineral revenue, excl. grants (% of GDP)	19.7	19.3	19.6	22.7	22.6	20.1
Tax as a % of total government revenue	86	83	89	89	93	93
GDP at current prices (in millions of Kina)	22,331	26,421	30,511	32,132	34,605	40,244

* Projected figures.

Note: Mineral revenue equals mineral and petroleum taxes; and mining and petroleum dividends.

Source: PNG authorities, IMF (2103) ‘PNG Staff Report’, Table 2, p.28.

Beyond 2014 the projected increase in government tax take due to LNG sales over the near-medium term is a modest 5 per cent of 2013 GDP. Given the PNG LNG project is approximately four-fifths owned by non-residents, ‘accelerated depreciation is expected to delay tax payments until early next decade’ ([IMF 2013, p. 15](#)).

Generally, the size of the tax take should not be used as an indicator of government effectiveness in increasing its tax base. Instead, the commonly used approach of ‘tax effort,’ the difference between predicted tax take and actual tax take, should be given consideration ([Moore 2013, p. 17](#)). Revenue performance can be improved by a few percentage points of GDP in any country, and it has found to be correlated with a wide range of developmental, structural and institutional indicators ([IMF 2013, pp. 59-62](#)).²¹

²¹ The IMF considers tax effort for PNG and cites a range of empirical literature on global revenue performance generally at f/n 73.

2. PETROLEUM AND GAS TAXATION LAW

The taxation of petroleum and natural gas in PNG is provided for in the *Income Tax Act 1959* (PNG). Petroleum and gas operations are covered by the general provisions of the Act covering all taxpayers. In addition, the *Income Tax Act 1959* contains specific provisions for mining, petroleum and designated gas projects.²²

A petroleum project may produce oil and natural gas together. Designated gas projects are defined in the *Oil and Gas Act 1998* and the *Income Tax Act 1959*. A designated gas project exists when a gas agreement has been signed with the Minister responsible for petroleum. Otherwise the arrangements for petroleum projects apply.

The *Oil and Gas Act 1998* covers upstream activities, pipelines and processing facilities. It provides for the granting of licenses for exploration, further assessment of discoveries, and the development of commercial projects, pipelines and processing facilities. Petroleum includes oil and natural gas, and the Act distinguishes between oil fields and gas fields. This differentiation can give rise to different fiscal treatment where an oil project is converted to a gas project. A gas field is defined as a petroleum field where oil recovery is not expected to be the primary object of petroleum development. A declining oil field may be converted to a gas field for the purposes of the Act.

Investor entities might enter into Resource and Development Agreements with the Minister of Petroleum and Energy on behalf of the State of Papua New Guinea. These agreements can modify the operation of the general taxation legislation by containing negotiated, project-specific tax concessions. They contain the terms of any state equity participation and any fiscal stabilisation provisions. They can be in conflict with existing laws, which may require amendment of those laws to make them consistent with the terms of the agreement. Petroleum and gas agreements also contain other fiscal arrangements such as royalties and fees, as well as landowner equity entitlements and project benefits for local communities and local governments.

Petroleum and gas agreements are strictly confidential. To overcome this lack of transparency, a new model agreement for each type of petroleum project is under preparation.

2.1 Taxes on petroleum and gas projects

Petroleum and gas operations in PNG are subject to company income tax, royalties and an Additional Profits Tax (APT) that now applies only to designated gas projects.

2.2 Company income tax

Extractive industry projects are subject to rates of company taxation as set out in Figure 9.

²² See *Income Tax Act 1959* (PNG) Division 10. For an overview of taxation of petroleum and natural gas see, Price Waterhouse Coopers, 2012, *Taxation of Resource Projects in Papua New Guinea*.

Figure 9. PNG: Company Tax Rates, 2014

	Resident	Non-resident companies
Mining	30%	40%
Petroleum - Existing Projects	50%	50%
Petroleum - New Projects	45%	45%
Petroleum - incentive rate	30%	30%
Gas	30%	30%

Source: PNG Internal Revenue Commission, *'A Guide to the Taxation Incentives for Business and Investment in Papua New Guinea'* (released 18/6/13) p.14; *Income Tax & Dividend (Withholding) Tax Rates Act* (PNG).

There are several different rates of company income tax for petroleum projects. For existing petroleum projects – those that existed and derived income before the end of 2003 – the company tax rate is 50 per cent.

For new petroleum projects – those that did not exist before the end of 2003 – the rate is 45 per cent. An incentive rate of company tax of 30 per cent applies in respect of any petroleum projects arising from a Petroleum Prospecting Licence granted between 2003 and 2007, from which a Petroleum Development Licence is granted before the end of 2017.

For designated gas projects the company tax rate is 30 per cent, which is equal to the incentive rate for new petroleum projects but lower than the 45 per cent base rate for new petroleum projects.

An income tax credit (an offset to income tax payable) is available up to the value of 0.75 per cent of assessable income derived in the year of income for expenditure on prescribed infrastructure for petroleum and gas operations. Excess tax credits can be carried forward.²³ Petroleum companies may apply for 'fiscal stability,' which if granted, results in the addition of a 2 percentage point premium to the company tax rate.²⁴ Fiscal stability is designed to lock in existing fiscal arrangements. Ultimately, however, an existing parliament cannot legally bind future parliaments.

Petroleum and gas development and operating costs are deductible on a project basis rather than a company-wide basis. This ring fencing means that operating costs incurred on one project cannot be offset against income from another project. Expenses that are attributable to more than one project, such as administration, are apportioned to each project on a reasonable basis.

A special incentive applies to the PNG LNG project. It allows for an additional deduction for allowable capital expenditure if the project has not reached a specified level of profitability at the end of the 10th year of production.

There are exceptions to the project basis in respect of exploration costs and discontinued projects. Exploration costs can be entered into a general exploration pool. A company can claim 25 per cent of the pooled exploration expenditure as a deduction against its assessable

²³ Section 219C, Income Tax Act 1959 (PNG) and Section 10F, Income Tax Regulations (PNG).

²⁴ See Resource Contracts Fiscal Stabilization Act 2000 (PNG). Income tax & Dividend (Withholding) Tax Rates Act (PNG).

income from an operating resource project, subject to not reducing income tax payable in that year by more than 10 per cent.²⁵

2.3 Royalties

A royalty is applied at the rate of 2 per cent of the wellhead value of petroleum or gas production.

New petroleum and designated gas projects are also subject to a development levy, which is also applied at the rate of 2 per cent of the wellhead value of production. Where both the royalty and development levy apply, the royalty may be claimed as a credit against income tax payable.

2.4 Additional Profits Tax (APT)

The APT was introduced in its current form in 2008 for designated gas projects including the PNG LNG project. The APT becomes payable if and when the accumulated value of net cash receipts becomes positive.

The APT is a progressive-rate tax comprising two rates involving two calculations. The first calculation is referred to as calculation X. Under this calculation the cumulative amount carried forward is uplifted using Accumulation Rate X. The second calculation is referred to as calculation Y. Under this calculation the cumulative amount carried forward is uplifted using Accumulation Rate Y.

Accumulation Rate X is 17.5 per cent and Accumulation Rate Y is 20 per cent unless the taxpayer has made an election to adopt the alternate rates. Where such an election is made the Accumulation Rate X is 14.5 per cent plus the rate of inflation for the year of income in the United States as measured by the Producer Price Index. Accumulation Rate Y is 17 per cent plus the rate of inflation for the year of income in the United States as measured by the Producer Price Index.

The rates of APT are 7.5 per cent of the amount of taxable additional profits determined under calculation X and 10 per cent of the amount of taxable additional profits determined under calculation Y. Any payments of APT at the 7.5 per cent tax rate are deductible for the purposes of calculating APT obligations at the 10 per cent tax rate ([Price Waterhouse Coopers 2012](#)).

2.5 Carry forward of losses

Taxpayers can carry forward losses indefinitely for petroleum and gas operations; compared to a 20-year limitation for other industries.²⁶

2.6 Interest, dividend and stamp duty concessions

For petroleum and gas projects there are a range of stamp duty, interest and dividend withholding tax concessions.²⁷

²⁵ Section 155N, Income Tax Act 1959 (PNG).

²⁶ Section 101, Income Tax Act 1959 (PNG).

²⁷ Sections 35(2)(e) and 42(3), Income Tax Act 1959 (PNG); Income Tax & Dividend (Withholding) Tax Rates Act; and Stamp Duties Act (PNG), schedule.

3. MINING TAXATION LAW

The taxation of mining in PNG is provided for in the *Income Tax Act 1959* (PNG). Mining operations are covered by the general provisions of the Act covering all taxpayers. In addition, Division 10 contains specific provisions for mining, petroleum and designated gas projects. Provisions for mineral royalties and state equity participation are contained in the *Mining Act 1992* (PNG).

Investor entities might enter into Resource Development Agreements with the State of Papua New Guinea. These agreements can modify the operation of general taxation by containing negotiated, project-specific, tax concessions. They contain the terms of any state equity participation and any fiscal stabilisation provisions. They can be in conflict with existing laws; which may require the amendment of those laws to make them consistent with the terms of the agreement. Mining development contracts also contain other fiscal arrangements such as royalties and fees, as well as landowner equity entitlements and project benefits for local communities and local governments. Mining development contracts are strictly confidential.

3.1 Taxes on mining projects

Mining operations in PNG are subject to company income tax and royalties. An Additional Profits Tax (APT) previously applied to petroleum, gas and mining projects, but now applies only to designated gas projects.

3.2 Company income tax

Extractive industry projects are subject to rates of company taxation as set out in Figure 9 above.

After taking account of dividend withholding tax, the rate of company tax on resident companies for distributed mining income is 37 per cent. For non-resident companies the company tax rate is 40 per cent.

An income tax credit (an offset to income tax payable) is available up to the value of 0.75 per cent of assessable income derived in the year of income for expenditure on prescribed infrastructure for mining operations. Excess tax credits can be carried forward.²⁸

Mining companies may apply for ‘fiscal stability,’ which, if granted, results in the addition of a 2 percentage point premium to the company tax rate.²⁹ Fiscal stability is designed to lock in existing fiscal arrangements. Ultimately, however, an existing parliament cannot legally bind future parliaments.

Mining development and operating costs are deductible on a project basis rather than a company-wide basis. This ring fencing means that operating costs incurred on one project cannot be offset against income from another project. Expenses that are attributable to more than one project, such as administration, are apportioned to each project on a reasonable basis.

²⁸ Section 219C, *Income Tax Act 1959* (PNG) and Section 10F, *Income Tax Regulations* (PNG).

²⁹ See *Resource Contracts Fiscal Stabilization Act 2000* (PNG) and *Income tax & Dividend (Withholding) Tax Rates Act* (PNG).

There are exceptions to the project basis in respect of exploration costs and discontinued projects. Exploration costs can be entered into a general exploration pool. A company can claim 25 per cent of the pooled exploration expenditure as a deduction against its assessable income from an operating resource project, subject to not reducing income tax payable in that year by more than 10 per cent.³⁰

A double deduction applies to mining exploration expenditure incurred after 1 January 2003.³¹ Exploration expenditure is deductible against resource income earned elsewhere within PNG; and if a resource project eventuates from the exploration expenditure, that expenditure can be deducted again from income from the resource project.

Overall, there are not major project-specific variations to the general fiscal regime for mining, with one major exception, the Ramu nickel mine. It was granted a 10-year tax holiday as well as an exemption from import duties.

3.3 Royalties

A royalty is applied at the rate of 2 per cent of the gross value of mining production.

3.4 Additional Profits Tax (APT)

An APT based on a project's net cash flow had applied generally to mining projects until 2003, when it was abolished.

3.5 Carry forward of losses

Taxpayers can carry forward losses indefinitely for mining operations; compared to a 20-year limitation for other non-extractive industries.³²

3.6 Interest, dividend and stamp duty concessions

For mining projects there are a range of stamp duty, interest and dividend withholding tax concessions.³³

³⁰ Section 155N, *Income Tax Act 1959* (PNG).

³¹ *Ibid.*

³² Section 101, *Income Tax Act 1959* (PNG).

³³ Sections 35(2)(e) and 42(3), *Income Tax Act 1959* (PNG); *Income Tax & Dividend (Withholding) Tax Rates Act*; and *Stamp Duties Act* (PNG), schedule.

4. THEORETICAL APPROACHES TO PETROLEUM, GAS AND MINING TAXATION

The finite nature of petroleum, gas and hard mineral deposits gives them a characteristic not shared by other industries. Those deposits that are of higher quality and closer to final market are capable of generating returns greater than the risk-weighted returns on investment needed to find, develop and extract them. These additional returns are known as resource rent and are also referred to as economic rent.

In most countries, petroleum, gas and hard mineral resource deposits are owned not by the landholder with title to the land above but by the state on behalf of the people. As resource owner, the state, which is the principal, engages in a contractual arrangement with a petroleum or mining company, which is the agent.

As principal, the state engages the agent to find, develop and extract resources. The objective of a fiscal regime is for the principal and agent to share risks and returns in a way that maximises the rent accruing to the state. From the agent's perspective, where a project is more risky and where a fiscal regime is more uncertain, the greater will be the returns required by the agent to justify investing in the project.

It is therefore in the interests of both parties to base the fiscal regime on resource rent and to avoid the sovereign risk associated with changing the tax regime after the investor has sunk capital into the project. Frequent changes in fiscal arrangements applying to new projects also heighten investor perceptions of sovereign risk. Under the resource rent principle, the investor is allowed to recover exploration and development costs before tax is payable, but when profits are high government revenue is high. These features of rent taxes offer stability of the fiscal regime over time, which is highly valued by investors.

... companies highlight stability and predictability as the most important aspects of taxation regimes. It seems to be well understood that there is often an inverse relationship between low tax rates and the stability of a tax regime (ICCM and Commonwealth Secretariat 2009, p. 11).

Since the actual rent realised from a petroleum, gas, or mining project depends on the revealed quality of the deposit as well as actual investment costs, operating costs, and prices, the rent-based fiscal regime needs to be sensitive to these variables.

The 'resource rent' principle provides the underpinning for much of the theoretical mining taxation literature. It supports the argument that taxation should be based on profitability, not on production or sales (ICCM and Commonwealth Secretariat 2009, p. 8).

Various fiscal regimes based on resource rent have been formulated ([Kraal 2013](#)). As early as 1948 E. Cary Brown attempted to address the shortcomings of production-based royalties through a variation of income-based taxation ([Brown 1948](#)). His approach, termed the 'cash flow method', applies tax to the difference between project cash inflows and cash outflows, both capital and recurrent. In cases where the cash flow happens to be negative, including at the start of a project when capital investment is occurring, the government provides a cash contribution set by the rate of tax multiplied by the negative cash flow. A cash contribution also applies to any negative cash flows associated with decommissioning projects at the end of a project's economic life. Under this approach a government shares equally in all losses

and profits. The government is effectively a joint venture partner with its level of equity participation determined by the tax rate.

Later, Garnaut and Clunies Ross (1975, 1979) posited their variation on the 'Brown tax' whereby a resource rent tax (RRT) was to be levied only on the accumulated positive net cash flow of a project. In instances of negative cash flows there are no government cash contributions. Rather such negative cash flows are carried forward with interest (the accumulation rate) to preserve their value to the investor.

The next refinement was the allowance for corporate capital (ACC) method derived by Boadway and Bruce (1984). The ACC method is different from the Garnaut and Clunies Ross RRT in that under the ACC method, capital expenditure is not fully deducted when incurred. Rather, capital expenditure is depreciated over its effective life. In instances of negative balances, the negative amount is carried forward at the 'allowance for corporate capital' rate (accumulation rate) to preserve its value. The method includes a 'tax credit' for project losses, which is refundable as a cash payment by the government.

Since the Brown Tax and the RRT are based on actual cash flows and the ACC method approximates a cash flow based tax, they do not distinguish between debt and equity financing of investment costs. Accordingly, interest on debt financing is not a deduction and nor are the dividends from equity financing. Instead, total cash outflows, whether funded by debt or equity or both, are deductible.

The Brown Tax is theoretically the tax that least distorts exploration and investment decisions, since the state is effectively a joint venture partner with the private investor on fully contributing terms. The state contributes its share of exploration and development costs by making cash payments to the investor and if the project fails to make profits or makes losses at the decommissioning stage the state again provides cash payments to the investor. For this reason the Brown Tax is described as a two-sided tax, sharing equally in profits and losses.

In practice, investors will doubt whether the state would make good on its obligations to provide cash payments in the event of projects ultimately making losses and during the decommissioning stage. They will assess that future governments would likely renege on their obligations to bear their share of project losses by making cash payments to transnational corporations. Consequently, while theoretically elegant, the Brown Tax is not applied anywhere in practice.

The Garnaut and Clunies Ross RRT does not make cash payments to the investor and does not oblige the state to contribute a share of project losses. For this reason it is described as a one-sided tax; it taxes high profits but does not compensate for any ultimate losses. While the RRT is far less distorting than taxes that are not based on actual cash flows, its one-sidedness can be seen to increase the risk of a project ultimately making after-tax losses. To help compensate for this risk, negative net cash flows are accumulated at a risk-adjusted accumulation rate. The more risky is a project, the greater is the risk premium that should be included in the RRT accumulation rate. If the RRT accumulation rate corresponds to the investor's hurdle rate – the rate the investor needs to justify undertaking the project – then the RRT taxes only the revealed resource rent. If the accumulation rate is less than the hurdle rate the RRT taxes more than the resource rent. If the accumulation rate exceeds the investor's hurdle rate, the RRT under-taxes the resource rent.

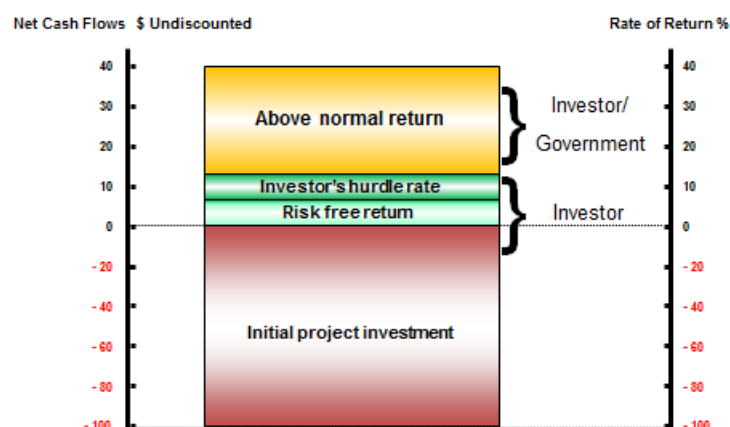
Australia's Petroleum Resource Rent Tax (PRRT), which is based on the Garnaut and Clunies Ross method, has been levied on offshore petroleum and gas since 1987. In 2012 the PRRT was extended to onshore petroleum and gas, including coal-seam gas developments. The present Australian government plans to retain the PRRT for both offshore and onshore petroleum and gas. Around A\$20 billion in revenue has been successfully collected by the PRRT. The accumulation rate for exploration costs under the PRRT is the Australian government's long-term bond rate plus 15 percentage points. For development costs the accumulation rate is the long-term bond rate plus 5 percentage points.

In 2010 an Australian government-appointed tax reform panel, chaired by Dr Ken Henry, released a report ([2009](#)) that recommended a rent tax on mineral resources. It was named the Resource Super Profits Tax (RSPT). The RSPT provided for conventional capital depreciation, with losses and undepreciated capital costs carried forward at an accumulation rate equal to the government's long-term bond rate. While the RSPT would collect 40 per cent of project profits, any ultimate tax losses were refundable by the government at the same rate of 40 per cent. Thus Australia's RSPT was based on the Boadway and Bruce ACC method, whereby capital expenditure is not fully deducted when incurred (see eg. [Kraal and Nash 2010](#); [Kraal and Yapa 2012](#)).

Industry judged that in respect of the RSPT the government of the day would not make good on its share of any ultimate project losses. Following an industry campaign against the RSPT, the Australian government substantially modified it. Renamed the Minerals Resource Rent Tax (MRRT), it applied only to iron ore and coal, for their resource rent value is generally much greater than for other minerals. The accumulation rate for the MRRT was the government's long-term bond rate plus 7 percentage points, and the effective tax rate was 22.5 per cent. Taxpayers could elect either historical cost or market value as a base to depreciate previous capital expenditure (starting-base assets). Starting-base assets at book value were depreciable over five years; while starting-base assets at market value were depreciable over 25 years. By contrast, new capital assets could be written-off immediately. MRRT losses were transferable to other iron ore and coal projects in Australia; unutilised MRRT losses could be carried forward, using the accumulation rate of the long-term bond rate plus 7 percentage points; and unused credits for State royalties paid could be carried forward at the long-term bond rate plus 7 percentage points. Unused MRRT losses and credits for royalties paid were not refundable. For new projects the MRRT therefore shared the design features of the PRRT but with different accumulation rates and tax rates. Both are applied versions of the RRT.

The Australian government that was elected in September 2013 gained Parliament's approval to rescind the MRRT, which left only royalty and company tax payable on mining activities.

Figure 10 shows a resource rent tax as a cash flow tax, where the tax is levied at a constant percentage of the difference between receipts and expenditure, or net positive cash flow. The cash flow in excess of the investor's hurdle rate represents the above normal profits, or resource rent.

Figure 10. A Cash Flow Resource Rent Tax

PNG's Additional Profits Tax for designated gas projects is an applied version of the RRT. The IMF assessed that the accumulation rate for PNG's APT was so high as to undermine the credibility of the fiscal regime, since nothing was paid. The IMF generally advises that developing countries should use low accumulation rates for rent tax purposes ([IMF 2012, p. 48](#)).

An addition to a rent tax on actual cash flow is cash bidding for exploration acreage. Cash bids would be based on anticipated rent, taking account of a project's fiscal obligations, so they are also a form of rent tax. Cash bidding can be a means of extracting residual rent on highly valuable acreage.

Leading theoretical work identifies the optimal combination of rent taxation based on actual cash flow and up-front cash bidding (see eg. [Emerson and Garnaut 1984](#); [Emerson and Lloyd 1983](#); [Leland 1978](#)). The greater is the risk aversion of the investor relative to the government, the greater is the reliance that should be placed on the rent tax based on actual cash flows. In these circumstances, the rent tax rate should be set at a relatively high rate, leaving the cash bidding process to pick up any residual anticipated rent on highly prospective exploration acreage.

Efficiency requires that more risk be borne by the party better able to bear it (IMF 2012, p. 14).

In ideal circumstances the RRT accumulation rate and tax rate would be tailored to reflect the characteristics of each project, since an investor's hurdle rate will vary with the perceived riskiness of different projects and the tax rate will reflect the optimal degree of risk sharing between the investor and the state. In practice, however, the uncertainty associated with negotiation of accumulation rates and tax rates for each project would heighten investors' perceptions of sovereign risk, elevating investors' hurdle rates and reducing resource rent. Given these realities, the RRT design features should be incorporated in general legislation but in a way that reflects the typical risk profiles of different types of resource projects.

In typical petroleum projects the major costs and risks are at the exploration stage. Typically, the chances of finding commercial reservoirs are low and the cost of drilling multiple exploration wells is high relative to development costs at the wellhead.

In mining projects, the main cost is the capital cost of developing a mineral deposit and risks of cost over-runs can be large. Exploration costs are relatively small compared with mine development costs. Investors will be anxious to recover the very large mine development costs out of project revenues as quickly as possible.

The emergence of unconventional gas, such as coal-seam gas and shale gas, gives it features more similar to those of hard minerals, where exploration risks and costs are lower than those of conventional gas relative to development costs ([IMF 2012, pp. 12-13](#)).

There are important differences between the oil, gas and mining sectors. Exploration is often costlier or riskier for petroleum (a deep water well, for instance, can cost over US\$100 million, and the chance of success in a new basin may be 1 in 20 or less). But the risks in the ‘development’ phase (bringing a discovery to extraction), and of failure during the extraction phase, may be greater for mining (IMF 2012, p. 12).

These considerations suggest a larger risk premium should be included in the RRT accumulation rate for petroleum and gas exploration costs and a lower accumulation rate should be used for development costs. For minerals, the RRT accumulation rate for development costs needs to take account of the risks associated with development, which will typically be greater than the risks associated with exploration.

A design feature for the RRT that would reduce the risk to investors of being unable to recoup exploration costs before the RRT becomes payable is to allow the pooling of exploration costs. That is, while ring fencing might apply to development projects, exploration costs anywhere in the country could be pooled and be deductible immediately against development project cash flows. Where they cannot be fully deducted in the year in which they were incurred, the pooled exploration costs would be carried forward at an RRT accumulation rate that would be lower than the rate that otherwise would apply if the exploration costs were ring fenced and therefore not pooled.

In determining accumulation rates for the RRT, they should not be set so low as to inadequately recognise the riskiness of the project and therefore tax more than the resource rent, but neither should they be set so high as to leave much of the rent untaxed. A further consequence of setting the accumulation rate too high is that it can lead to wasteful over-investment, or gold plating, by effectively subsidising resource investment ([Garnaut and Clunies Ross 1975, 1983; IMF 2012, pp. 22, 59](#)).

As to the rate at which the RRT should be applied, in theory it can be set at 100 per cent, since it is taxing only the rent – the returns in excess of those necessary for the investment to be made. However, if the rate of rent tax is set too high, the project operator would have an incentive for inefficient operating practices, since the operator would be permitted to keep only a small share of any savings from more efficient practices.

If the rate of RRT is set too low, resource rent will be under-taxed. The lower is the tax rate the stronger is the case for cash bidding for exploration acreage to help collect expected residual rent.

Taxes that are not based on resource rent can have deterrent effects on exploration, project development, and the recovery of parts of the deposit or reservoir that are more expensive to extract. Royalties on minerals are levied in two ways: on an output-basis (by volume or value) of production; or on an income-basis (a tax on profits). The volume approach is not tax neutral from an industry perspective, as it is levied irrespective of the profitability of a project, noting the typically high capital costs of the minerals industry. The deterrence is greater the higher is the royalty rate. Even if royalties are applied at low rates, the consequence is that parts of a deposit or reservoir that are more expensive to extract, but which would otherwise be profitable to extract, will be left in the ground. Further, the value (*ad valorem*) method of calculation can be complicated, for mineral values must be calculated back to the wellhead, field gate, or mine gate value. From a state's perspective, the volumetric method does not reflect a market of high commodity prices, thus revenue flow can be flat; while the income-basis royalty might generate no revenue if early capital costs of the producer are high.

Company tax is usually applied to all incorporated businesses within a country. It is based on an accounting notion of profits rather than on resource rent. In assessing company tax, there is no allowance for companies to achieve their hurdle rate of return on investment. Capital expenditures are not deductible immediately, as is the case with rent taxes, but are written off over a specified number of years. Interest on debt is deductible for company tax purposes but not for rent taxes.

While company tax can deter projects that otherwise would have proceeded, its general applicability on returns to equity argues in favour of it applying to petroleum, gas and mining operations. Otherwise, investment will tend to flow into the income tax-exempt mining, petroleum and gas sector and away from other economic activities.

In an effort to tax resource rents, company income tax could be applied to petroleum, gas and mining, but at a rate higher than the applicable rate for other industries. While this would pick up some extra rent for the state, the deterrent effects of company tax on exploration and development would be even greater.

Concerns have been expressed that the RRT can lead to delays in taxation revenue, leading to community demands for increased resource taxation in times of high mineral, petroleum, or gas prices. Any attempt to bring forward revenue departs from resource rent taxation, with the consequent deterrent effects on exploration and development. Applying company income tax at a higher rate is one such attempt. Another is a so-called R-factor tax where R stands for the ratio of cumulative revenues after company tax to cumulative capital costs. Those revenues and costs are accumulated at a zero accumulation rate – each year's figures are just added together. When the R-factor reaches one, the cumulative revenues just equal the cumulative costs. An R-factor greater than one is chosen as the trigger point for the R-factor tax.

Another variation of the RRT (or APT) is a so-called Income Tax Surcharge ([Taxation Review Committee 2014, pp. 43-45](#)). It calculates a project's assessable income for company income tax purposes. It then adds back losses that have been carried forward. Then it adds back depreciation deductions. Then it adds back interest and financing deductions. It then

deducts any capital expenditure incurred in the period. It then deducts any income tax paid in the period. If the result is negative it is a surcharge loss and it is carried forward to be offset against any future surcharge gains. If the result is positive, any carried forward surcharge losses are offset against it. If a positive amount remains, then the surcharge tax rate is applied to the surcharge gain. It is argued that this is a simple tax more easily understood by the citizens of PNG, but while the Income Tax Surcharge does not involve an accumulation rate, it involves nine steps ([Taxation Review Committee 2014, p. 44](#)), and taxes more than a project's resource rent, with consequent deterrent effects on exploration and development.

The tax data required for the APT is the same data that is required for the assessment of company income tax. An Income Tax Surcharge relies on company tax data – it does not require less information than does company tax or the APT. The problem with PNG's APT has not been any extra data requirements but it's very high accumulation rates of 17.5 per cent and 20 per cent. These high accumulation rates have ensured the APT has never been paid.

One form of resource rent is equity participation, if designed on a carried-interest basis: where State equity is paid for out of a project's future positive net cash flows. It is equivalent to the RRT with an accumulation rate equal to the rate at which the cost of the equity is uplifted and carried forward. If the equity participation is paid for as it falls due, it is equivalent to a Brown Tax, making the state a joint venture partner. However, if this equity participation on fully contributing terms does not occur during the exploration stage, the state is not fully participating in project risks and costs, giving it a degree of one-sidedness instead of being fully equivalent to a Brown Tax. If the state takes an equity position but does not pay for it, the effect is the same as a higher rate of company tax, since it gives to the state a share of accounting profits set at the rate of equity participation.

5. CONCERNS WITH PNG'S NATURAL RESOURCE TAXATION

5.1 Frequent changes since the late 1980s

PNG's taxation regime for petroleum, gas and hard minerals has undergone frequent changes that began with the highly concessionary terms of the 1967 Bougainville Copper Agreement under colonial administration, and found to be unsustainable. It led to Agreement renegotiations in 1972 and 1974.

The 1974 renegotiated Bougainville agreement removed the major concessions: a three-year tax holiday, immediate write-off capital expenditure, and exemption from income tax of 20 per cent of income from copper sales. A novel progressive profits tax was introduced. Income in any year in excess of 15 per cent of an agreed capital base would attract tax at the rate of 70 per cent. The capital base would be adjusted annually for new capital expenditure.

The Bougainville project's progressive profits tax was a forerunner to the RRT. In PNG the RRT took the name of the APT and was applied to the Ok Tedi copper and gold project. The Ok Tedi Agreement of 1976 combined company income tax with an APT set at the rate of 70 per cent less the prevailing company tax rate. The accumulation rate for the APT was either 20 per cent or 10 percentage points above the prevailing prime corporate lending rate in the United States, at the investor's choice at the commencement of production. Dividend withholding tax was applied at the rate of 15 per cent. An ad valorem royalty was applied at the rate of 1.25 per cent.

In mining projects the PNG government could take an equity position of up to 20 per cent on fully contributing terms.

These features were subsequently included in general mining tax provisions in the income tax legislation, though accumulation rates were slightly different. For mining the accumulation rate was either 20 per cent or 12 percentage points above the prime corporate lending rate, but the tax legislation did not include government equity participation; this was to be negotiated on a case-by-case basis.

In the general petroleum legislation of the late 1970s, the company tax rate was set at the higher rate of 50 per cent, compared with the generally prevailing rate at the time of 36.5 per cent; and no dividend withholding tax applied to petroleum companies. An APT (RRT) was applied at the rate of 50 per cent and the APT accumulation rate was higher than for mining, at 27 per cent.

For petroleum the PNG government could take an equity position of up to 22.5 per cent on a carried-interest basis. The government purchased its equity out of future petroleum cash flows by carrying forward an amount equal to the cost of equity at an accumulation rate of 5 percentage points above the US prime corporate lending rate.

The effect of the carried-interest equity was to add another rate of APT. Petroleum projects that earned less than the prime corporate lending rate plus 5 percentage points paid no APT. Those that earned more than that rate but less than the APT accumulation rate paid rent tax at the rate of 22.5 per cent. Projects that earned more than the APT accumulation rate paid rent tax at the marginal rate of 72.5 per cent, being the carried-interest equity rate of 22.5 per cent plus the APT rate of 50 per cent ([Emerson and Garnaut 1984, pp. 88-89](#)).

These arrangements remained in place until the late 1980s. From 1989 through the 1990s, successive governments amended and added to the fiscal regimes for petroleum, gas and mining. Between 1995 and 1999 there were 13 significant changes to these arrangements ([Banks 2001](#)). They mainly increased the taxation of petroleum, gas and mining, moved to production-based charges such as royalties, brought tax payments up-front, and moved away from rent taxation. They were made on an *ad hoc* basis and severely affected investor confidence.

Faced with a sharp downturn in mining, petroleum and gas exploration and development during the 1990s, the PNG government made further changes in 2001 to increase the attractiveness of the fiscal regime to investors. Even more changes were made effective from the beginning of 2003. Under these arrangements the company tax rate was set at 30 per cent, an accelerated depreciation allowance was granted, a double deduction was offered for exploration expenditure, the APT was abolished, and the option of a fiscal stability clause was offered at a cost of a 2 percentage point addition to the company tax rate.

An APT was reintroduced for designated gas projects in 2008, but at tax rates below that applied prior to 2003.

5.2 Inadequate revenue collection

PNG's petroleum, gas and mining taxation system has collected too little revenue during periods of high profitability; and concessions provided in project-specific agreements that override general legislation have greatly reduced effective rates of taxation.

In its country report for PNG, the IMF ([2013](#)) warns that the PNG tax system will require greater efforts toward revenue collection to keep the fiscal deficit in check. In mining, petroleum and gas taxation it calls for the rationalisation of exemptions and concessions and the implementation of IMF recommendations on fiscal arrangements for extractive industries with a view to increasing government revenue. The IMF ([2013, pp. 8-9](#)) recommends the government move towards relying on rent-based taxes and remove some tax incentives such as income tax holidays and the double deduction for exploration.

The IMF ([2012, p. 6](#)) has analysed mining and petroleum taxation regimes around the world. It estimates that for mining, taxation regimes are simulated to collect 40-60 per cent of resource rents, while for petroleum the share is higher, at 65-85 per cent. The IMF considers the country's fiscal regime collects too little rent. As a result of tax concessions, and the abandonment of the additional profits tax in 2003 (for mining), the average effective tax on PNG's mining, oil and gas companies is now on the low side of fiscal regimes across the world. Observers have noted that the Ramu nickel and cobalt mine has a 10-year tax holiday before it will contribute to national revenue. Other similar concessions have been made to the mining sector.³⁴

As the PNG Taxation Review Committee ([2014, p. 14](#)) points out, the APT for gas projects is not highly progressive, leading to relatively low government take when project profitability

³⁴ See eg. 'Economic challenges for the Papua New Guinea government,' August 2012, <http://www.eastasiaforum.org/2012/08/15/economic-challenges-for-the-new-papua-new-guinea-government/>>.

increases. The reasons are that the first accumulation rate of 17.5 per cent is high and the two tax rates of 7.5 per cent and 10 per cent are low ([Taxation Review Committee 2014, p. 14](#)).

6. GLOBAL TRENDS IN NATURAL RESOURCE TAXATION

Globally, there are up to eight sets of factors acknowledged as obstacles to increasing tax revenues ([Moore 2013](#)):

1. Economic structure;
2. Systemic use of rent-taking;
3. Use of the tax system as a direct instrument of rule;
4. Lobby group politics ([Kraal 2012, 2013](#); [Kraal and Yapa 2012](#));³⁵
5. Configuration of government institutions;
6. TNC (trans-national corporation) profit shifting;
7. Poor tax administration practice; and
8. Property tax issues.

Without describing all of the above, Point 3, for example, concerns how power is used selectively to favour certain entities through tax exemptions and concessions of various kinds; while at the other extreme, there might be threats of punitive audits to reluctant taxpayers. The power to tax can thus deplete the tax take. Point 6 might apply to PNG, for it concerns TNC profit shifting — an issue that is a current focus of international tax experts. Profit shifting is exacerbated by tax incentive competitiveness between governments to attract business investment and the global extensiveness of TNC activities, which together can give rise to transfer pricing ([Leite 2012](#); [Nitsch 2012](#); [OECD 2013](#)). Research indicates that mining TNCs are more under-taxed than those entities engaged in oil and gas ([Lundstol et al. 2012](#); [OECD 2013](#)).

6.1 Legal arrangements

In the post-colonial era the legal mechanisms for collecting the state's share of resource project profits have taken different paths for petroleum, gas and mining. In mining the contract between the principal (the state) and agent (a private investor) has typically involved the state granting exploration and development leases to private companies. Private commercial entities control the resource extraction process and have ownership of the minerals extracted, but pay royalties and taxes for the extraction rights. The legal framework in the developing world for petroleum and gas has involved contractual arrangements where national oil companies have been granted monopoly rights to extract petroleum and gas resources. The national oil companies then enter into production sharing contracts with foreign providers of investment and services ([IMF 2012, p. 17](#)). In legal terms, the contractor gains a share of the extracted petroleum and gas to cover costs and receive remuneration. The state oil company retains a share of production as profit.

The historical reason for production-sharing contracts and service contracts being used in petroleum and gas development was that they were seen as a better reflection of national sovereignty in the post-colonial era. First used in Bolivia in the early 1950s and by Indonesia after independence, such contracts were in reaction to the colonial-style leasing arrangements whereby foreign oil companies gained leases, owned the petroleum produced, and extracted it on highly concessionary fiscal terms. State-owned companies now control around 80 per cent

³⁵ In Australia, new legislation to increase mineral taxes through a new resource rent tax was effectively opposed by business lobby groups.

of world petroleum and gas reserves and 15 of the 20 largest oil companies are state-owned ([IMF 2012, p. 23](#)).

6.1.1 Petroleum and gas taxation

Production sharing contracts can be designed to take account of exploration and development costs to a greater or lesser extent, just like different types of resource taxes ([IMF 2012, p. 17](#)). Where no costs are allowed, a production-sharing contract is equivalent to volumetric or ad valorem royalty set at a rate determined by the production split between the national oil company and the foreign contractor.

Some production-sharing contracts apply higher production splits in favour of the national oil company the greater is the daily rate of production from the field. This is equivalent to a sliding-scale royalty.

Another form of production-sharing contract is based on accumulated net cash flows from a project. This is equivalent to the RRT with an accumulation rate of zero. Finally, some production-sharing contracts are based on the internal rate of return achieved on the project. This is equivalent to the RRT with a positive accumulation rate.

In developed countries, conventional leasing systems, like those applying to mining, are still common in the petroleum and gas industries. The state issues exploration and development leases, the private investor retains control of production, and taxes are applied.

Up-front cash payments are common in fiscal regimes for oil and gas. They can be negotiated or set by competitive bidding processes. Up-front cash payments are used in production-sharing contracts and service agreements, as well as in conventional leasing arrangements.

The IMF has observed an increasing use of resource rent taxation in the petroleum and gas industries ([IMF 2012, p. 21](#)). Typically, a form of rent tax is combined with a royalty to constitute a total 'resource charge'.

Nevertheless, the United States still relies heavily on royalties, in combination with up-front cash bidding and company tax. Canada has been moving to rent taxes. Norway combines a rent tax with company tax in what has been a very stable fiscal regime. After frequent changes, the United Kingdom has settled on a rent tax and company tax. Australia combines a rent tax with company tax for oil and gas developments.

6.1.2 Mining taxation

In the colonial and early post-colonial era, mining tax regimes were typically highly concessionary to the investor. Lengthy tax holidays were granted to encourage private investors and when any tax was payable it would usually be at low rates. Rent taxes were unknown. From the mid-1970s through to the early 1980s different rent taxes were designed and applied. They were usually applied in addition to the general company tax system and accompanied by an *ad valorem* royalty.

From the mid-1980s and in the 1990s, when mineral prices were at historical lows, mining taxation design was driven by international comparisons of tax regimes and a perceived need for a country's mining tax system to be internationally competitive. It has been suggested that

the process of bidding for scarce foreign investment during the 1990s may in some instances have reduced government shares of revenue to excessively low levels ([ICCM and Commonwealth Secretariat 2009](#)).

The preceding report claims that as minerals prices boomed from around the mid-2000s, mainly through demand from China, governments of mineral-rich countries turned their attention again to gaining a reasonable share of the very large profits being generated from mining. However, it has been observed that on the whole, mining taxation regimes have not been heavily profits-based, suggesting they were designed when mineral prices were low and countries were competing with each other for investment.

A further possible reason why rent taxes have not grown greatly in popularity during the period of higher prices from the mid-2000s is that they are perceived in developing country jurisdictions to be more difficult to administer than royalties. Yet for a government that already administers company tax effectively, the extra complexity and effort involved in administering a rent-based tax is small ([ICCM and Commonwealth Secretariat 2009](#)).

Royalties applied at a relatively low rate have been a typical feature of mining taxation regimes. Usually royalties have been *ad valorem* rather than volumetric, sometimes with a sliding rate scale such that higher rates of royalty apply when mineral prices are high. It has been suggested that *ad valorem* royalties applied at a low rate and assigned to local governments can enhance a project's acceptability to the local community. However, the empirical evidence for this contention is considered inconclusive ([ICCM and Commonwealth Secretariat 2009](#)).

6.1.3 Stability clauses

In an effort to address problems of sovereign risk, governments and investors from time to time have inserted so-called stability clauses in contractual agreements. These are designed to lock countries into fiscal arrangements to safeguard against future legislative changes. Stability clauses are usually inserted in circumstances where the bargaining position of the government is weak. However, when the government's bargaining power strengthens with rising resource prices, pressure intensifies to rescind stability clauses, creating even greater perceptions of sovereign risk. A government in office when mineral prices are high will not necessarily feel bound by the decisions of predecessor governments run by political rivals ([ICCM and Commonwealth Secretariat 2009, p. 9](#)).

7. OPTIONS FOR TAX REFORM

7.1 General legislation or specific agreements?

In designing fiscal arrangements for petroleum, gas and mining, governments have a choice of enshrining them in general tax legislation or negotiating them on a project-by-project basis and including them in specific agreements. A hybrid might involve specific agreements that refer to the generally legislated tax arrangements but which provide for project-specific variations such as special investment incentives.

The weight of international evidence favours the transparency of general legislation. Specific agreements based on bilateral negotiations tend to be less stable over time, as new governments tend to feel less morally and politically bound to them than to general economy-wide legislation. This instability is exacerbated when agreements are kept confidential between the government and the investor. The political cost of varying legislation that applies to all companies, in terms of elevating sovereign risk, acts as a constraint on governments unilaterally changing fiscal arrangements for resource projects ([ICCM and Commonwealth Secretariat 2009, p. 12](#)).

7.2 Rent tax, company tax and modest royalty

A fiscal regime that requires a fair share of revenue from petroleum, gas and mining developments, while minimising deterrence to profitable projects and offering stability over time, could comprise company income tax, a rent-based tax, and an *ad valorem* royalty set at a modest rate. This is the fiscal regime recommended by the IMF in its technical assistance report on fiscal regimes for extractive industries ([IMF 2012, pp. 6, 26](#)). The strengths of such a regime are that it ensures some revenue flows from the commencement of production and that government revenue rises where rents are large. This progressivity in the regime offers stability over time, lowering perceptions of sovereign risk.

In addition, to reduce the riskiness of exploration and therefore investors' hurdle rates, a case can be made for government facilitating early geological survey work. Results of the work would be made publicly available. By reducing risk and lowering investors' hurdle rates, government-funded early geological survey work could increase the overall tax take. A government agency could do this work directly or, if it lacked the necessary expertise, could contract it out to private surveyors ([Emerson and Lloyd 1983; IMF 2012, p. 58](#)).

As the IMF points out, this combination of royalty, company tax, and rent tax can be applied across a wide range of circumstances for mining, oil and gas projects, though the combinations might vary ([IMF 2012, p. 26](#)). This regime could be augmented by up-front cash bidding for exploration acreage in circumstances where it is clear there is competition for exploration leases.

Among the major alternative rent taxes – the Brown Tax, the Garnaut and Clunies Ross RRT, and the Boadway and Bruce ACC method – the RRT is the most practical, not requiring up-front cash contributions from government or payments to investors in the event of ultimate project losses. The RRT, in the form of Australia's Petroleum Resource Rent Tax (PRRT), has proven stable over a quarter century and effective in collecting a fair share of rents.

The APT, which previously applied to petroleum, gas and mining developments in PNG, is identical to the RRT. The RRT can be applied at a single rate, as with Australia's PRRT, or at progressive rates, as with PNG's APT for designated gas projects.

Fiscal arrangements for petroleum, gas and mining developments in PNG should be incorporated into general legislation and not varied for individual projects or over time. While petroleum and gas agreements entered into with the State of Papua New Guinea should cover non-taxation matters, the fiscal arrangements should be those contained in general legislation.

Fiscal stability clauses on individual contractual agreements have not been found to be effective in reducing perceptions of sovereign risk, since they inevitably come under pressure in circumstances of high resource prices.

Countries that have attracted substantial mining investments in recent decades have used general fiscal terms rather than case-by-case negotiation. These include not only advanced countries such as Australia, Canada or Norway, but also Bolivia, Brazil, Chile, Indonesia, Namibia, Peru and South Africa (IMF 2012, p. 36).

The general legislation would be the income tax legislation with separate divisions for rent taxes for mining and for petroleum and gas. Different RRT parameters would be legislated for mining and for petroleum and gas.

IMF simulations suggest reasonably achievable average effective tax rates of 40-60 per cent for mining and 65-85 per cent for petroleum and gas ([IMF 2012, p. 29](#)).

Renegotiation of terms agreed in contracts can elevate perceptions of sovereign risk. However, as the IMF observes, renegotiation can be warranted where terms have become egregiously out of line with international practice, or with terms in comparable circumstances. When renegotiation happens through consultation or mutual agreement, it can strengthen the investment climate ([IMF 2012, pp. 36-37](#)). Unilateral variation of fiscal terms for existing projects, however, would inevitably increase investor perceptions of sovereign risk in PNG.

Equity participation by the PNG government on fully commercial terms would usually necessitate large government borrowings from overseas sources to finance equity contributions. Equity participation on fully commercial terms would oblige the state to take on the risk of paying back debt in the event of project proceeds being insufficient to do so. If the state did not take on this risk, the participation would not be on fully contributing terms and the state's equity stake becomes more akin to company income tax.

If state equity were to be purchased out of future profits on a carried-interest basis, it would be equivalent to another tier of RRT whose rate is set at the percentage of equity held by the state. This would need to be taken into account in assessing the overall size and reasonableness of the tax take from oil and gas projects.

8. RECOMMENDATIONS FOR REFORM OF PNG NATURAL RESOURCE TAXATION

8.1 For all future petroleum, gas and mining developments

It is recommended that the fiscal regime for all future petroleum, gas and mining developments comprise company income tax and dividend withholding tax at the generally prevailing rates (30 per cent for company tax and 15 per cent for dividend withholding tax), a royalty and a resource rent tax in the form of an APT.

The company income tax should be part of petroleum, gas and mining taxation regime so that some revenue is raised from activities of low profitability. The business community generally accepts this form of impost.

The *ad valorem* royalty at the rate of 2 per cent should be retained. It is acknowledged that this form of taxation should be payable irrespective of project profitability. However, its low rate of 2 per cent, and the potential for this revenue to be expended early in the life of projects to remedy social and environmental extraction impacts, supports the argument for its retention

A resource rent tax in the form of an APT should be applied to oil, gas and mining developments, be legislated in a timely manner, and with appropriate 'low-profit' thresholds to exclude taxpayers with small amounts of assessable profits. The APT should be applied at a single rate.

For petroleum and gas, the APT rate should be higher than the present 10 per cent top rate for gas. As a guide, the tax rate for the Australian PRRT is 40 per cent. The accumulation rate for exploration expenditures under the PRRT is the Australian government's long-term bond rate plus 15 percentage points and for development expenditures it is the long-term bond rate plus 5 percentage points. PRRT payments are deductible for company income tax purposes. While the PRRT is assessed on a project basis, exploration expenditures incurred by the same corporate entity outside the project area are immediately deductible against project cash flows. The PRRT should be used as a model in designing PNG's APT for petroleum and gas, and its legislation is not too complex or lengthy for tax practitioners or their clients. Consideration should be given to the accumulation rates and tax rates for the APT being lower than those of the PRRT.

Turning to the APT rate for mining, as a guide, the tax rate for the Australian MRRT was 22.5 per cent. The accumulation rate for the MRRT was the government's long-term bond rate plus 7 percentage points. Exploration expenditure anywhere in PNG should be deductible against assessable income from operating projects for APT purposes. Undeducted exploration expenditure should be carried forward at a low accumulation rate for APT purposes.

The fiscal regime for petroleum, gas and mining should be incorporated in general legislation and development agreements confined to non-fiscal arrangements and matters such as revenue sharing with local governments and landholders. Stability clauses should be removed from legislation.

Any state equity participation other than on fully commercial terms is effectively another form of tax and should be taken into account in setting the rate of APT. While it has been argued that equity participation gives the state a full stake in the success of projects and a

sense of land ownership, conflicts can arise between a government's role as regulator and owner. In any case, the petroleum, gas and hard minerals in the ground are unambiguously owned by the state, with or without state equity participation. The financing of state equity participation on fully commercial terms would inevitably increase sovereign debt. The debt-raising capacity of government might be better used for investing in economic and social infrastructure.

Moreover, whereas rent tax payments may be claimed as a credit against an investor's income tax liability in its home jurisdiction, dividends from state equity are unlikely to be creditable. State equity participation therefore entails costs and risks to the state that are not borne in the case of rent taxes, which argues against using state equity participation as a profit-sharing device in PNG petroleum and gas projects ([Taxation Review Committee 2014, pp. 36-39](#)).

Cash bidding should be used to allocate future petroleum and gas exploration licences and relinquished and surrendered exploration acreage, utilising an open and transparent institutional process. Cash bidding should also be used for hard minerals where there is evidence of competition for exploration acreage. The PNG government should consider contracting out early stage geological survey work, funded from within the proceeds of cash bidding, with information gathered being made freely available to participants in cash bidding processes to help inform their bids and maximise the value of bids received. This system has worked successfully in Australia.

8.2 For all existing petroleum, gas and mining developments

Exploration expenditure for petroleum and gas anywhere in PNG should be deductible against assessable income from operating projects. This would replace the limited pooled exploration cost provisions. The exploration double deduction for mining exploration should be removed. Consideration should be given to entering into discussions with the Ramu nickel project operators about the tax holiday and exemption from import duties. No other changes are recommended.

REFERENCES

- Australia's Future Tax System Panel 2009, *Australia's Future Tax System: Report to the Treasurer, Canberra, (Henry Tax Review)*, released 2 May 2010.
- Banks, G 2001, *Papua New Guinea Baseline Study*, International Institute for Environment and Development, Sydney <<http://iied.org/>>.
- Boadway, R and Bruce N 1984, 'A General Proposition on the Design of a Neutral Business Tax', *Journal of Public Economics*, vol. 24, no. 2, pp. 231-239
- Bourassa, M and Turner J (eds.) 2013, *Mining in 31 Jurisdictions Worldwide*, Getting the Deal Through.
- Brown, EC 1948, *Business-Income Taxation and Investment Incentives*, in (eds.) L Metzler, H Perloff and E Domar, *Income, Employment and Public Policy: Essays in Honour of Alvin H. Hansen*, Norton, New York.
- Emerson, C and Garnaut R 1984, 'Mineral Leasing Policy: Competitive bidding and the resource rent tax given various responses to risk', *Economic Record*, vol. 60, no. 169, pp. 133-142
- Emerson, C and Lloyd P 1983, 'Improving Mineral Taxation Policy in Australia', *Economic Record*, vol. 59, no. 166, pp. 232-244
- ExxonMobil PNG Limited 2014, "Onshore Pipeline Complete," <http://pnglng.com/project/>.
- Garnaut, R and Clunies Ross A 1975, 'Uncertainty, Risk Aversion and the Taxing of Natural Resource Projects', *Economic Journal*, vol. 85, no. 338, pp. 272-287
- Garnaut, R and Clunies Ross A 1979, 'The Neutrality of Resource Rent Tax', *Economic Journal*, vol. 55, no. 3, pp. 193-201
- Garnaut, R and Clunies Ross A 1983, *Taxation of Mineral Rents*, Clarendon Press, Oxford.
- ICCM and Commonwealth Secretariat 2009, *Minerals Taxation Regimes: A review of issues and challenges in their design and application* International Council on Mining and Metals and Commonwealth Secretariat London.
- IMF 2012, *Fiscal Regimes for Extractive Industries: Design and Implementation* International Monetary Fund, Washington DC.
- IMF 2013, *Papua New Guinea: Staff Report for the 2013 Article IV Consultation*, International Monetary Fund, Washington DC
- Kraal, D 2012, 'Australia's Minerals Resource Rent Tax: the multi-national mining industry response', *Australasian Journal of Natural Resources Law & Policy*, vol. 15, no. 1, pp. 77-106
- Kraal, D 2013, 'A Grounded Theory Approach to the Minerals Resource Rent Tax ', *Australian Tax Forum*, vol. 28, no. 4, pp. 841-874
- Kraal, D and Nash R 2010, 'Minerals Resource Rent Tax (MRRT): mining project evaluation techniques', *The Tax Specialist*, vol. 14, no. 1, pp. 26-33
- Kraal, D and Yapa PS 2012, 'Resource Rent Taxes: The Politics of legislation', *Australian Tax Forum*, vol. 27, no. 3, pp. 485-525
- Leite, C 2012, *The Role of Transfer Pricing in Illicit Financial Flows*, in (ed.) P Reuter, *Draining Development? Controlling Flows of Illicit Funds from Developing Countries* World Bank, Washington DC.
- Leland, HE 1978, 'Optimal Risk Sharing and the Leasing of Natural Resources, with Application to Oil and Gas Leasing on the OCS', *Quarterly Journal of Economics*, vol. 92, pp. 413-437
- Lundstol, O, Raballand G and Nyirongo F 2012, *Mining Revenues in Zambia and Tanzania: Fiscal design, technical capacity or political will*, International Centre for Tax and Development, Brighton.

- Mineral Resources Authority of Papua New Guinea 2012, *Mining and Exploration Bulletin*, July–December, pp. 1-90
<http://www.mra.gov.pg/Portals/2/Publications/Bulletin/julydec2012/Issue%202.pdf>.
- Minerals Resources Authority of Papua New Guinea 2014, 'Officers learn about Involuntary Resettlement & Sustainable Mining', *Mineral Tok*, no. Jan-Feb, pp. 1-6
<www.mra.gov.pg/>.
- Moore, M 2013, *Obstacles to Increasing Tax Revenues in Low Income Countries*, International Centre for Tax and Development Brighton, UK.
- Nitsch, V 2012, *Trade Mispricing and Illicit Flows*, in (ed.) P Reuter, *Draining Development? Controlling Flows of Illicit Funds from Developing Countries* World Bank, Washington DC.
- OECD 2013, *Addressing Base Erosion and Profit Shifting*, Organisation for Economic Co-operation and Development, Paris.
- PNG Chamber of Mines and Petroleum 2014, "Petroleum in PNG," <<http://pngchamberminpet.com.pg/petroleum-in-png/>>.
- Port Jackson Partners 2013, *Bold Thinking: Imagining PNG in the Asian Century*, ANZ Bank.
- Price Waterhouse Coopers 2012, *Taxation of Resource Projects in Papua New Guinea*, Price Waterhouse Coopers.
- Price Waterhouse Coopers 2013, *The Direct Economic Impact of Gold*, World Gold Council.
- Taxation Review Committee 2014, *Papua New Guinea Taxation Review for 2013-2015. Issues Paper No.1: Mining and Petroleum Taxation*
PNG Government, Port Moresby.

Comment on “**Taxation Reform Options for the Petroleum, Gas and Mining Industries in Papua New Guinea**” by Craig Emerson and Diane Kraal.

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COMPANY TAX, ROYALTY AND APT

- The paper’s recommendations advocate the use of a corporate tax rate, a royalty and a resource rent tax for future petroleum developments. In fact, PNG’s fiscal regime already incorporates those features so this approach is consistent with our current fiscal regime.
 - Income from oil operations is already subject to tax at a 50% rate and gas at a 30% rate
 - Both the above are subject to royalties which are effectively based on some measure of profitability given the well head value calculation, a basis which is supported by the authors as opposed to a royalty based solely on value (page 17)
 - The APT as it applies to gas and state participation are effective rent taxes that will achieve the progressivity that is required. APT seems to have been dismissed as an option based solely on the fact that historically APT has failed to derive significant revenue. It is an open question whether APT failed to collect revenue historically because of a design flaw in the accumulation rate or because it applied in a time of lower commodity prices and hence project developers were making lower returns
- By design, the APT is an effective resource rent tax mechanism, with the only real question being what is the appropriate accumulation rate
 - Hurdle rates for APT in the negotiation of gas development agreements and therefore revenue derived from APT is within the control of our Government.
 - Let us understand what revenue the State derives from the PNG LNG Project through APT before we consider moving away from it. The next significant gas development is some way off
- There appears to be more than one view on accumulation rates for a resource rent tax:
 - The resource rent tax that the authors and the IMF support feature an accumulation rate which effectively allows for the time value of money and is also a mechanism for setting an appropriate economic return for project developers
 - The resource rent tax alternatives proposed by the Tax Review Committee’s Issue Paper do not feature an accumulation rate and hence would result in taxes being borne by project developers prior to the derivation of an economic profit
Departing from APT requires a balanced view by the people of Papua New Guinea of the benefits and shortcomings of the alternative given the high stakes that are involved. All that may be required is to adjust the status quo to deliver optimal results for the people of Papua New Guinea. State Equity
- PNG is a society based on customary ownership of land. This manifests itself in the desire of the people to own a direct stake in the exploitation of our country’s resources. So State equity is deeply rooted in the psyche of our people. It is consistent with the spirit and intent of our Constitution, which promotes participation on an equal footing in the exploitation of our natural resources. This desire has led to the Government’s current policies on State equity participation.

- There may be merit in dropping State equity, but how does a nation move away from this notion and still feel that we are truly benefitting from the exploitation of our mineral wealth? This is the question that requires an answer.
- Turning to State policy which is to maintain the status quo, 2 issues arise:
 - The efficiency of the investment vehicles employed by the State to manage State equity and pass through revenue to the State. There are a mix of investment vehicles at the moment, shares in Oil Search and direct participation through Petromin and the National Petroleum Company of Papua New Guinea
 - A Government has to deliver services and infrastructure. But should it also invest? Papua New Guinea has lacked 3 elements in realizing its aspirations to own and operate in our industry, capital, management capability and technical know-how. Access to capital is no longer an issue. We are 5 years or so away from realizing the management capability. You can hire technical expertise. It is difficult to discard the policy of State equity without debating the issues more broadly of this forum.
- Beyond that, State equity is a well-known form of resource rent tax. It is progressive and in the case of PNG where the State only backs in at the development stage, the State carries no exploration risk, benefits from knowledge transfer and also buys in to projects at a discount to the commercial value. Buying in at historic cost is a significant upfront tax on project developers and economically speaking is not an efficient tax mechanism.
- Finally, State participation also creates an alignment of interests between the State and project developers. State equity is our industry's fiscal stability premium. The development of large scale resource projects requires the close co-ordination of developers, the State, financiers, landowners and other stakeholders. In our experience, State and landowner participation has resulted in more timely development of projects as all parties work towards a common goal. Timely development of these types of projects creates significant economic benefits. PNG LNG is testament to the benefits of this partnership. PNG LNG is so far ahead of its schedule to deliver contracted LNG cargoes that it has commenced spot cargoes until its contractual commitments are due later in 2014.

STABILITY CLAUSES

- The authors suggest that stability clauses create uncertainty amongst investors. One can identify with the issue that is raised. Is stability guaranteed? The power relationship between Host Government and Developer evolves over time. In PNG's case for example, we have been able to deliver a foundation LNG Project. PNG's credentials have been established and its economic future has been secured. The power relationship has shifted to the State. PNG can dictate the pace at which subsequent developments are progressed and also the fiscal terms on which they are brought to fruition. As the domestic capital market starts to grow even more, stability may become less relevant. So perceptions of instability may be a fact of life. This all points to interesting times ahead as both Host Government and our industry engage on the industry's growth agenda and the fiscal terms on which future developments are undertaken
- Having said that, stability clauses do influence lender perceptions of risk and consequently the cost of finance. Marginal projects will be the biggest beneficiary of the retention of

stability clauses because of the positive effects of stability clauses on borrowing costs. Beyond Elk/Antelope, all future gas developments will be of a largely marginal nature.

EXPLORATION DEDUCTION CONCESSIONS

- The authors advocate an open discussion with regard to exploration deduction concessions, referring to the IMF 2013 Staff Report. However, the exploration deduction concessions that are flagged for review in the Tax Review Committee's paper are those that apply to the mining industry, not the petroleum industry. Therefore we assume that the authors are referring to the proposed removal of the cap on deducting pooled exploration expenditure as a method to incentivize exploration in PNG.
- Much of PNG remains unexplored. Most acreage is spread over 5 sedimentary basins. All of the known discoveries are marginal and stranded. All exploration over the last 20 years has been undertaken in one sedimentary basin. Therefore the proposed change and any other measure designed to promote greater investment in exploration is important for Papua New Guinea.

REMOVAL OF RESOURCE DEVELOPMENT AGREEMENTS

- The authors support the removal of resource development agreements and replacing them with a set of model agreements. We note that the development of model agreements is already taking place across the PNG mining and petroleum industries and we support this approach and the general avoidance of the use of tax incentives as they can distort the market. In our industry, each discovery brings its unique characteristics in size, quality and access to market. A standard approach needs to incorporate sufficient flexibility to promote the development of otherwise marginal projects. PNG is a country which presents significant geological, topographical and infrastructure challenges and this has led to a significant number of "stranded" resources. One of the key challenges of any fiscal reform agenda is how to unlock the economic benefits associated with these stranded resources.
- Historically tax incentives granted in PNG have been in the form of tax holidays or rate cuts. Going forward we are receptive to the use of tax incentives for marginal projects but these need to be progressive in the same manner as a resource rent tax. Where a once marginal projects benefits from macroeconomic changes such as spikes in commodity prices, the project should face a tax impost consistent with other taxpayers.

CASH BIDDING

- The implementation of a cash bidding system is considered by the authors to be a mechanism that would promote exploration.
- In a country with no capital gains tax regime, it is imperative that any bidding system is based on technical merit and work programs. There have already been examples in PNG of speculative acquisition of exploration licences by parties without the financial support or technical ability to undertake an exploration program. It is this ability to undertake an exploration program, and ideally to then develop a discovered resource, that should be the main focus in the process of allocating licences as that will be the largest driver of State revenue and economic growth in PNG
- The overall approach needs to take one step back and examine the relationship between the State and the Minister and his powers under the Oil and Gas Act and the interaction of that office with our industry's regulatory authority and the industry and restore the

integrity that has been eroded over the years. This includes deciding what our regulatory philosophy might be, whether it should be self-regulated, prescriptive or a hybrid and understanding what that might mean for the role of the regulator, regulatory capacity and capability and the licensing regime. All of that should then inform policy makers as to whether or not the cash bidding system might be appropriate.

Concluding remarks

The PNG Tax Review is an important step in setting the platform for the next phase of economic growth in PNG. The challenge is and will always be to optimize State take without having a material adverse effect on the attractiveness of PNG as a global petroleum investment destination. With respect to international petroleum characteristics, we cannot ignore the nature of PNG geology, topography and the lack of infrastructure which make for a high cost environment. The real challenge is not the design of our fiscal regime, it is translating mineral wealth into a transformed economy and country and the equitable distribution of that wealth across this great country.

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A Comment on “**Taxation Reform Options Mining, Petroleum and Gas Industries in Papua New Guinea**” by Craig Emerson and Diane Kraal.

David Caradus

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The data provided by the IMF suggests there has not been sufficient revenue collected during periods of high profitability and recommends reliance on resource rent taxation, removal of tax holidays and the double deduction for minerals exploration expenditure.

These comments present only one side of the story as it is clear a greater amount of tax has been paid during periods when commodity prices were higher. However, at the same time it needs to be remembered that another function of increased commodity prices is increases in operating costs. In PNG it must also be remembered that our main operating mines and petroleum project have been operating for many years, most mines face difficult mining conditions, some have required further capital investment and so higher commodity prices do not automatically translate to higher profits.

Under the existing law allowable capital expenditure is amortised on a ten year straight line basis for petroleum and gas projects and for mining projects which commenced prior to 31 December 2002. For mining projects commencing after 31 December 2002 allowable capital expenditure is amortised on 25% diminishing value basis. Assuming these reasonable rates of amortisation are retained it is considered there is no need for projects to seek a tax holiday and the negative perceptions created by granting a tax holiday can be avoided.

As far as I am aware, no taxpayer has actually claimed a double deduction for minerals exploration expenditure. As such the incentive has proved attractive to explorers but at this point has not resulted in any “lost” revenue. I would suggest clarifying the technical operation of the double deduction mechanism to ensure the potential double deduction is available once through the deduction for allowable exploration expenditure and the second deduction through the Section 155N pool deduction. This will ensure there is a cap placed on the amount of the double deduction and ensure in a year a deduction is claimed tax remains payable.

The paper notes that losses of resource projects can be carried forward indefinitely but does not mention that deductions for allowable exploration expenditure and allowable capital expenditure are capped such that the amount of the deduction in a year can’t create a tax loss. It follows that the ability to carry forward losses indefinitely (which by the way also applies to primary producers) does not offer any real concession to resource projects.

The paper is persuasive in the commentary on the concept of resource rent and seems to acknowledge that the existing state equity represents in part a resource rent. As the State acquires its interest at cost the effect of State equity is to impose a 100% rate of tax on the profits attributable to that portion acquired by the State through the exercise of the state equity option. If it is not possible for the State to give up the state equity option the design of a resource rent tax needs to take into account the effective taxation impact of state equity. This would suggest higher rates of return and lower tax rates than envisaged in the papers.

Over the last thirty years there have been a number of changes to the taxation of resource projects with the most recent significant changes being those made with effect from 1 January

2003 for mining projects and those made in 2008 in respect of the LNG Project. Given that taxation law in PNG is generally only changed at the time of the annual National Budget it may be an overstatement to say there have been frequent changes to the general principles of the taxation of resource operations in PNG. On balance I would say there has been stability in the essential concepts of the taxation of resource projects since the introduction of the current Division 10 was included in the Income Tax Act with effect from 1 January 2001.

Resource Project Agreements serve a number of purposes and are not just for agreement in respect of fiscal terms. Accordingly, it is considered such agreements should not simply be abandoned. However, to reduce the use of such agreements for the negotiation of fiscal terms the taxation law should be amended to deal with matters which seem to be standard terms including:

- Amend Section 14 (2) of the Income Tax Act to take away the Commissioner General's discretion to allow foreign currency reporting for companies engaged in resource operations (including exploration).
- Amend Section 40AA of the Income Tax Act to give automatic exemption of "leave fares" for employees working at the site of resource operations.
- Amend the Customs Tariff Act and Excise Tariff Act to provide for automatic exemption from import duties for the construction of resource projects.
- Amend the Resource Projects Fiscal Stabilisation Act to provide for automatic application of fiscal stabilisation.

For mining up-front cash bid is a disincentive to take up exploration rights, and does not promote real "in-ground" expenditure. Expected revenue under such a scheme is questionable as it's highly unlikely mining companies will pay large amounts of cash to undertake Greenfield activities. Exploration is a major expense to shareholders, and the pool of capital available to undertake such activities is limited (especially in the current climate). Both of these lead to fewer discoveries and less economic development.

For oil and gas exploration a move to replace the current 'apply any time' process with competitive tendering would be a significant improvement but should be based on a structured work program bid system, not on cash bidding. As an overall comment the existing system of taxation of resource projects has been successful in attracting explorers and investors to PNG. The concepts and the law are not overly complex. Where the Taxation Review can add considerable value is in identifying areas where the administration of the law can be made simpler. At the present time the IRC's inefficiency in managing all aspects of taxation administration represents a cost to all business and to the State. The State has already identified the IRC as an area of government administration which requires improvement.

In general, it is considered the focus should be on ensuring the IRC is able to efficiently manage the existing system before undertaking significant change to the taxation of resource projects or the taxation system generally.