Marginal Field Economics: Investigating the Viability of Malaysian RSC Model

by

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CERTIFICATION OF APPROVAL

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Approved by,

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CERTIFICATION OF ORIGINALITY

This is to certify that I am responsible for the work submitted in this project, that the original work is my own except as specified in the references and acknowledgements, and that the original work contained herein have not been undertaken or done by unspecified sources or persons.

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MUHAMMAD FIRDAUS ABDUL RAZAK

ABSTRACT

Development of marginal hydrocarbon fields is becoming the topic of interest among oil and gas industry players. In Malaysia, Risk Service Contract (RSC) is used for development of marginal fields. This paper will investigate the viability of Malaysian RSC implementation. The objectives of this research are to conduct comparative analyses between conventional PSC and RSC, between local RSC and foreign RSC; to evaluate current fiscal agreements for marginal fields; and to recommend methods to improve the economics of marginal fields to atrract investors. The scope of study of the project includes the implementation of PSC and RSC in Malaysia, economic modeling, and competencies of local companies. The methodology used for this project is conducting critical analysis on PSC and RSC implementation and also analyzing the local companies' competencies to be marginal field operators. The finding of the project conclude that RSC implementation in Malaysia still needs further assessment and PETRONAS should reveal more on the RSC model to allow more in-depth and research to be conducted.

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1.1 Background

1.1.1 Oil Production

The major challenge that global upstream operators are facing currently is the decline of oil production due to lack of investment during the Late-2000s Recession[1] that began in 2007. Oil producing companies must strategically plan their exploration and production activities to minimize risk due to the volatile demand and price of crude oil. Oil production in Malaysia has been steadily decreasing since reaching a peak of 862,000 bbl/d in 2004 due to its maturing offshore reservoirs[2]. (Refer to appendices)

1.1.2 Marginal Hydrocarbon Fields

The development and production of marginal fields also play important role in increasing profit for oil companies. . Marginal oil field is also defined as a field that can produce 30 million barrels of oil equivalent or less Malaysia as a major oil producer in South-East Asia region has several marginal fields such as Berantai, Sepat, Bergading, and Balai Cluster.

1.1.3 Economics of Hydrocarbon Production

Hydrocarbon production is a vital component of a nation's economic sector. Several fiscal agreements had also been used to govern the contractual system of oil and gas operations. In order to maintain the hydrocarbon sector as an attractive investment, the fiscal agreements must contain suitable share of economic rent to the government and enough return to the contractor as well. The correct fiscal terms are vital to enable balance between attracting investments and obtaining fair return to the country. Furthermore, economic rent is also important in a fiscal agreement. Economic rent is defined as returns in excess of supply price of investment, which are the returns over and above the investment necessary to appraise/explore, develop and produce from fields[3]. Economic rent enables the evaluation of

surplus between a project's revenue and its costs and it is important to both contractor and the government.

Furthermore, another important economic aspect of hydrocarbon production is the contractor and government takes. It describes the contractor's and government's entitlement of gain/profit over the life of a project. In general, the government and contractor take is calculated using the following formula[4]:

Government Take (%) = Royalty + Tax + Bonus

Contractor Take (%) = 1 – Government Take

As mentioned earlier, fiscal agreements are used to determine the distribution of economic rent between contractor and government. For the purpose of this project, the author will focus on contractual arrangements which consist of Production Sharing Contract (PSC) and Risk Service Contract (RSC) since the scope of study only involves these two.

1.1.4 Competencies of Local Contractors

The production from marginal fields in Malaysia such as Berantai in Terengganu is handled by consortium made up of foreign partner and local contractors. The contractors that were chosen to develop the fields must be competent since the development of marginal fields is still new to local oil and gas industry, thus the risks involved are high. The question rises when the contract is given to local contractors which have no experience in handling marginal fields. Since the operator of marginal field also fabricates the facilities, there might be issue regarding cost checking. Furthermore, the huge amount of investment in marginal fields also poses risk to local contractors since they are relatively small companies in terms of market capitalization. This issue will be further discussed and elaborated in Chapter 5: Result & Discussion.

1.2 Problem Statement

The Malaysian government along with state-owned company, PETRONAS have collaborated closely to develop marginal fields to ensure fair returns to both parties. Furthermore, the Risk Service Contract (RSC) has been introduced to enhance the development of marginal fields. Implementation of RSC in Malaysia is still new and studies are yet to be done to determine its effectiveness. This research will further investigate the viability of current fiscal agreements and challenges faced to develop marginal fields to upstream operators. This project is highly significant since not many studies have been done regarding the implementation of RSC in Malaysia.

1.3 Objectives

I. To conduct a comparative analysis between Production Sharing Contract (PSC) and RSC
II. To conduct a comparative analysis between local RSC and foreign RSC
III. To evaluate current fiscal agreements for marginal fields.
IV. To recommend methods to improve the economics of marginal fields to attract investors.

1.4 Scope of Study

I. <u>Implementation of PSC & RSC in Malaysia</u>

This project will investigate the implementation of PSC & RSC in Malaysia to study the competitiveness of the RSC model.

II. <u>Competencies of Local Companies</u>

The competencies of local companies (contractors) in dealing with marginal fields will also be investigated. The companies will be analyzed in terms of manpower, market share, past practices/experiences, and technical capabilities

1.5 Relevancy & Feasibility of Project

This project is highly relevant for the author since it will provide the author with additional knowledge in the discipline. Furthermore, the increasing attention for marginal field developments in the oil and gas industry also makes this project highly relevant. This project will equip the author with important knowledge in current development of hydrocarbon fields in terms of petroleum economics.

Moreover, the project have also been planned properly to ensure that it is feasible within the time frame of Final Year Project (FYP). The project activities have been arranged to suit the scope of study accordingly. For FYP I, focus is given towards literature reviews and theory while FYP II will focus on the analysis data and information. The methodology will be further elaborated in Chapter 4: Methodology.

Chapter 2: Literature Review

2.1 Production Sharing Contract (PSC)

2.1.1 Overview

PSC is the most common type of contractual arrangement around the world. This type of arrangement allows the government to maintain ownership to hydrocarbon resources and select contractor to explore and produce resources in return for a share of production[5]. The important elements in PSC are cost oil and profit oil. Cost oil is defined as the percentage of revenues that is used to recover capital costs, operating costs and exploration cost. In addition, profit oil is defined as remaining revenues after cost oil deduction and is shared between the government and contractor according to an agreed percentage.

2.1.2 Typical PSC Structures

Table 1 outlines typical PSC components[6]:

The primary components of this simple PSC include the bonus, royalty, cost recovery limit, profit oil split and taxes.

Summary of Commercial Terms	
Signature Bonus	**$10MM**
Royalty Rate	**10%**
Cost Recovery Limit	**50%**
Government Share Profit Oil	**60%**
Corporate Income Tax (CIT)	**30%**
Depreciation Rate	**5 year straight line (20% per year)**

Analysis Summary			
Government Take (Undiscounted)	**Downside** 90%	**Economic** 76%	**Upside** 75%
Government Take @ 12.5% Discounted Cash Flow (DCF)		86.5%	
Marginal Government Take		74.8%	
Effective Royalty Rate (ERR)		34%	
Entitlement Index		53%	

Table 1: Typical PSC Components

The following figure illustrates an example of PSC flow diagrams[7].

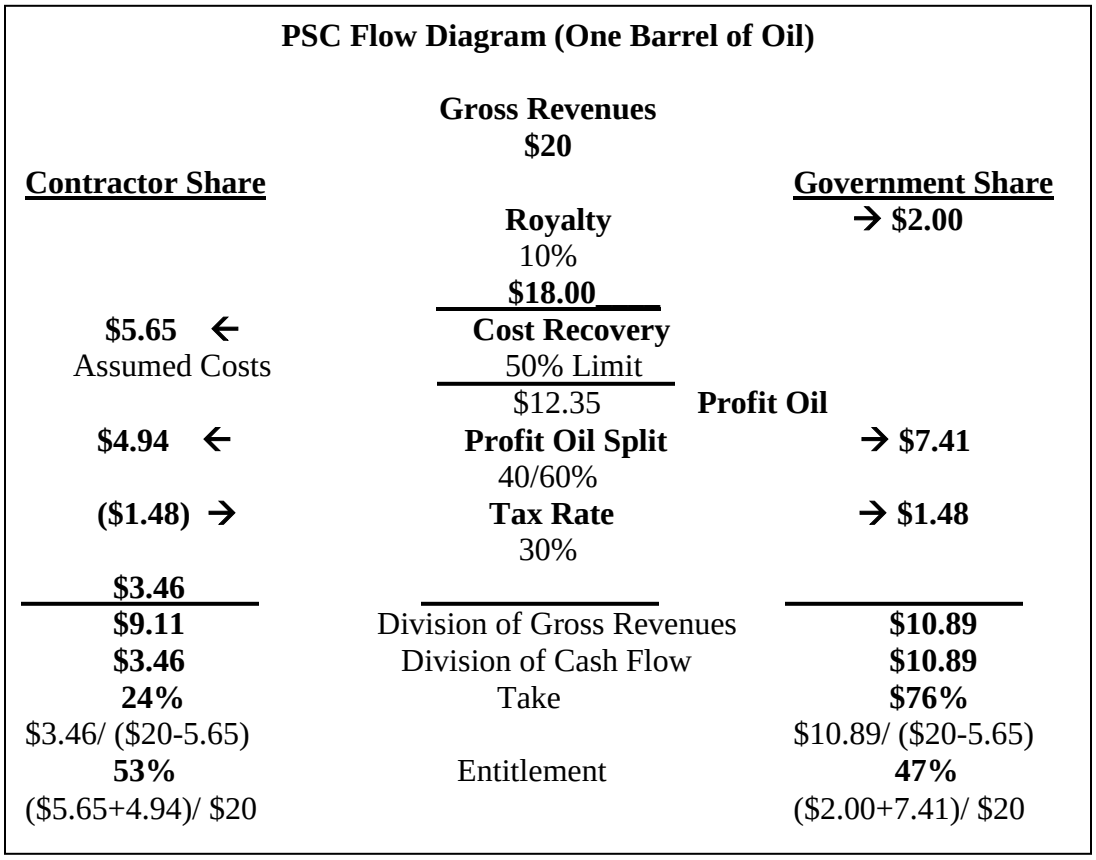


Figure 1

2.1.3 Indonesian PSC Agreements (1966)

The first PSC was signed in August 1966, between Pertamina (Indonesian Oil Company) and IIAPCO[8.] This PSC provided the framework for worldwide PSCs that were structured later. In summary, the concept was as follow:

1. The state remained as owner of hydrocarbons.
2. Pertamina continued management control, contractor executed the petroleum operations.
3. The contractor provided all financing and technology required for the operations
4. Contractor purchased equipments and the properties were owned by Pertamina.

2.1.4 Malaysian PSC Structure

The following table provides the Malaysian PSC Model in 1997[8].

Duration	29 years from effective date; Exploration 5 years Production 20 years for oil 20 years + 5 year holding period for Gas
Relinquishment	No interm relinquishment
Exploration Obligation	Bid items
Bonuses	None
Royalty	10% + 0.5% Research Cess

Profit Oil Split and Cost Recovery

Individual Field Total Hydrocarbon Volume (THV) = 30MMBLS or 0.75TCF

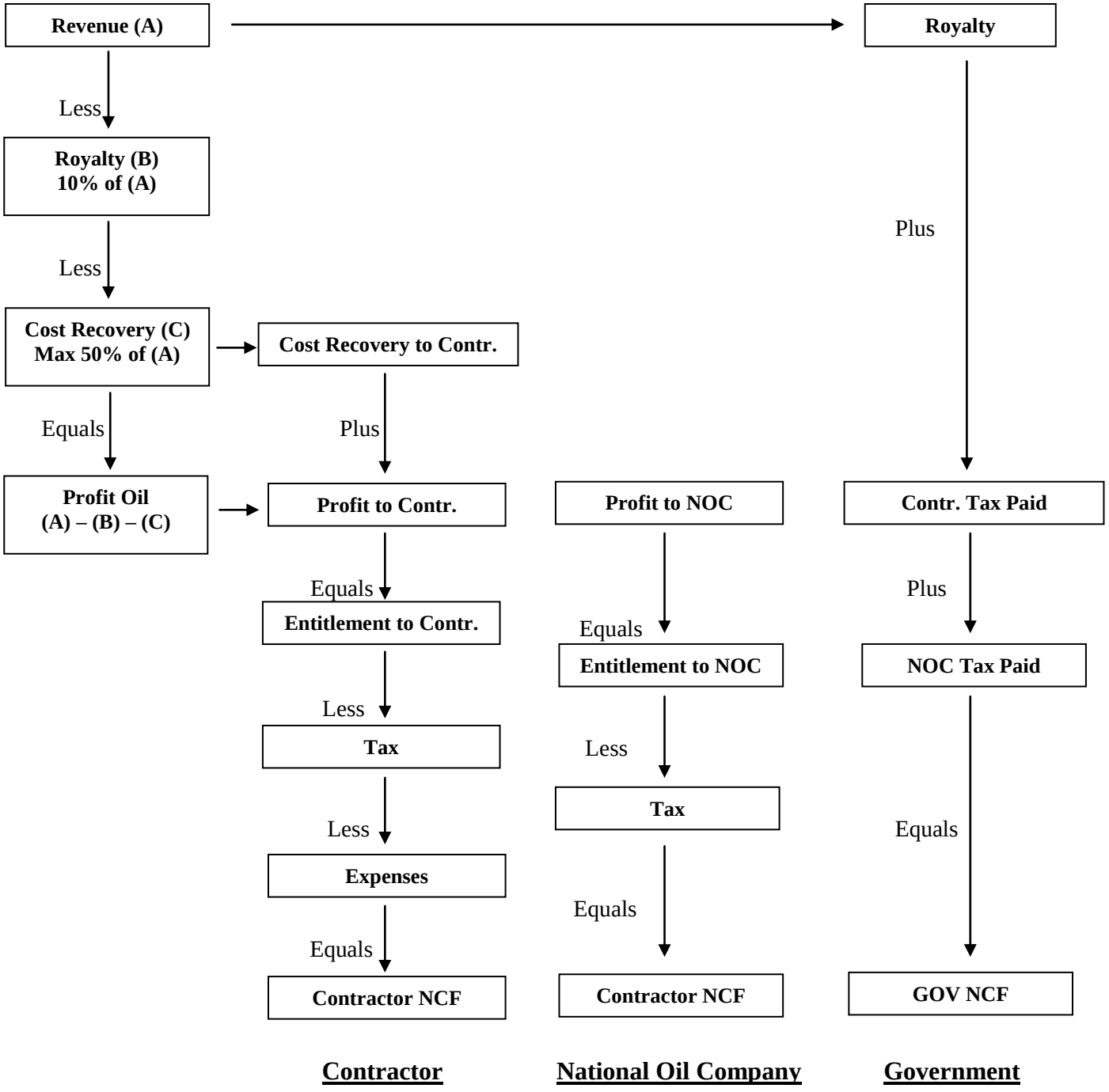
Contractor's R/C Ratio	Cost Oil (Gas) Limit	PETRONAS Share Profit (Oil and Gas)			
		Cumulative Production Below THV		**Cumulative Production Above THV**	
		Unutilized C/O Split	**Normal P/O Split**	**Unutilized C/O Split**	**Normal P/O Split**
0-1.0	70%	N/A	20%	N/A	60%
1.0-1.4	60%	20%	30%	60%	70%
1.4-2.0	50%	30%	40%	60%	70%
2.0-2.5	30%	40%	50%	60%	70%
2.5-3.0	30%	50%	60%	60%	70%
>3.0	30%	60%	70%	60%	90%

Government Take				**Effective Royalty Rate**	**Lifting**	**Savings Index**	**Data Quality**
Downside	**Mid-range**	**Upside**	**Margin**				
79%	**82%**	**84%**	**92%**	**18%**	**54%**	**20¢**	**Good**

Table 2: Malaysian PSC Model

2.1.5 Split of Barrel under PSC Model

The following figure describes the split barrel under PSC model[9]



*NCF= Net Cash Flow

Figure 2

2.2 Risk Service Contract (RSC)

2.2.1 Overview

RSCs or service contracts are agreements where a contractor provides all the capital required for exploring and developing a hydrocarbon block[10]. Under RSC agreement, government owns all production and the contractors are compensated with revenues from the hydrocarbon sales. The contractors will not be compensated if the exploration or development fails. In detail, the government allows the contractor to recover the costs during exploration and development through hydrocarbon sales and pay the contractor a fee (remuneration) that is based on percentage of the remaining revenues. RSC were being used in countries such as Argentina, Brazil, Phillipine, and Venezuela.

2.2.2 The Philippines RSC Model

The service contract used in Philippines is similar to most PSCs except the addition of Filipino Participation Incentive Allowance (FPIA) [11]. Similar to royalty, FPIA is part of the service fee except that it goes to the contractor. The Philippines contract has a 70% cost recovery limit and the profit sharing is typically 60%/40%. However, the contractor profits share of 40% is not subject to taxation since the taxes are paid out of the government share of profit oil. The calculation of the contractor entitlement is based on the following assumptions:

Gross revenues = $100 million
Assume Contractor Group eligible for full 7.5% FPIA
Cost eligible for cost recovery= $50 million – high cost case
$20 million – low cost case

The following table describes the contractor entitlement under Philippines contract.

Table 3: Contractor Entitlement

Low Cost Case	High Cost Case	Remarks
$100.0 MM	$100.0 MM	Gross revenues
-7.5	-7.5	FPIA service fee
92.5	92.5	Net revenues
-20.0	-50.0	Costs recovery
72.5	42.5	Revenues available for sharing
-43.5	-25.5	**Government 60% share**
29.0	17.0	Contractor 40% share
+7.5	+7.5	FPIA
$36.5	$24.5	Total contractor service free
+20.0	+50.0	Costs recovery
$56.5 MM	$74.5 MM	**Total Contractor Entitlement**
45.6%	**49.0%**	**Contractor take****

*Total contractor service fee / (Gross reveues – cost recovery)

In the low cost case, the revenue for sharing was $80 million after deducting the $20 million cost recovery. The government entitlement was $43.5 mllion (43.5% or revenues) while the contractor's share was $56.5 million. It can be interpreted that FPIA acts like a negative royalty.

2.2.3 The Iranian RSC Model

In Iran, a type of buy-back agreement is implemented and it is a type of risk service contract. Under the buyback contract, the IOC will provide the investment costs and implement exploration and/or production operations for petroleum projects[12]. The IOC will receive remuneration fee to compensate for the initial development costs. The maximum remuneration fee is 60% of production under long-term export oil sale agreement (LTEOSA). Since its RSC implementation in 1995, Iranian government has awarded a total of 24 contracts which consist of 16 development projects and 8 exploration projects[12].

2.2.4 The Iraqi RSC Model

The net cash flow (NCF) under Iraqi RSC model can be calculated using the following steps and equations[13]:

NCF = Total income – Total costs

Where:

1. Total income = Contractor Remuneration + 8 Quarters CAPEX + Cost Recovery Allowed
2. Total costs = OPEX + CAPEX

Calculating Contractor Remuneration

To calculate the contractor remuneration, the following steps are used:

1. Cumulative CAPEX= CAPEX until field reaches handover date.
2. Remuneration Index is assumed to be 1.5.
3. Expected cumulative CAPEX = Maximum of cumulative CAPEX to handover date.

Overall remuneration = Remuneration index * expected cumulative CAPEX

Contractor remuneration = 10% * Revenue

Balance to be recovered = Overall remuneration – Cumulative remuneration

Cost Recovery

Cost recovery limit = 50% * Revenue

Net Income = Total costs – Cost recovery limit

Cumulative net income$_t$ = Net income$_t$ + Cumulative income$_{t-1}$

Cost recovery allowed = Minimum between total costs and cost recovery limit

Cost unrecovered = Cost recovery allowed – Total costs

Cumulative cost unrecovered$_t$ = Cost unrecovered$_t$ + Cumulative unrecovered$_{t-1}$

Therefore;

Government take = Revenue – Total Costs – Contractor NCF

2.2.5 The Venezuela RSC Model

Table below summarize the RSC model for Venezuela in 1996[14].

Table 4: 1996 Risk Service Agreements "Strategic Associations"

Area	8 to 12 areas in blocks (less than 2,000km^2)
Duration	Exploration up to 9 years Total 20 years with option to extend by 10 years
Relinquishment	
Exploration Obligations	2 wells per 1,000km^2 in first 4 years More wells required if exploration continues into 5-7 years
Signature bonus **Data Packages** **Bid Fee**	Initial Guarantee $500,000 $50,000 $100,000 per bid
Royalties	16.67% Based on ROA= Pre-tax profit/Asset Book Value

Taxation	Sliding scale PEG tax levied on pre-tax profits PEG tax= Extra government take (0-50%) 67.7% Corporate income taxes Investment tax credit limited to 2% of taxable income
Depreciation	Exploration and development drilling UOP
Ringfencing	Yes
DMO	None
Gvt. Participation	Sliding scale up to 35%

Government Take				**Effective Royalty Rate**	**Lifting**	**Savings Index**	**Data Quality**
Downside	**Mid-range**	**Upside**	**Margin**				
93%	**91%**	**88%**	**87%**	**16.7%**	**0%**	**20¢**	**Good**

2.3 Malaysia's Marginal Fields Inventives

The decline of oil production in Malaysia requires the government and upstream operators to focus on enhancing production output from existing fields or from new discoveries. Marginal fields can be classified in both categories; existing mature field or newly discovered field. Due to the smaller revenue, developing them will be economically challenging. However, there is strong drive to achieve production targets and obtain profit to compensate for the lower internal rate of return (IRR) of only 11 to 20 percent.

According to Worldvest, PETRONAS is working closely with the government in three ways[14]. Firstly, PETRONAS will review the PSC terms and initiate new petroleum agreements. This method will attract investment from the operators since the economic incentives may compensate the

cost for field developments. Next, PETRONAS will invite operators that have specialization in developing marginal fields. Such operators have specific development and operating approach that is able to overcome the challenges of marginal fields. Lastly, collaboration among operators and contractors will be facilitated by PETRONAS to allow sharing of facilities and other cooperative methods.

Moreover, there are five incentives that have been proposed by PETRONAS for development of marginal fields. The new incentives are expected to provide an additional RM58.2 billion of revenue over the next 20 years to the Government[15]. The incentives are as follow:

- Investment tax allowance of between 60 - 100 percent of capital expenditure to be deducted against statutory income. This incentive will encourage the development of capital-intensive projects. *(i.e. Enhanced Oil Recovery (EOR), High CO2 gas fields, High Pressure High Temperature (HPHT), Deepwater and Infrastructure projects for Petroleum Operations)*
- Reduced tax rate from 38% to 25% for marginal oil field development in order to improve profitability of the field developments.
- Accelerated Capital Allowance to 5 years from 10 years for marginal oil field development to improve project viability.
- Qualifying Exploration Expenditure transfer between non-contiguous petroleum agreement with the same partnership or sole proprietor to enhance contractors' risk taking attitude, which could encourage higher level of exploration activity.
- Waiver of export duty on oil produced and exported from marginal oil field development to improve project commerciality.

2.4 Malaysia's Risk Service Contract (RSC)

One of the current economic incentives is the RSC. PETRONAS have been implementing RSC for marginal field development purposes. The structure for current RSCs is listed below[16]:

- Marginal Fields are located within a producing block and its main product is oil.
- The International Oil Company (IOC) provides technical, financial, managerial or commercial services to the state from exploration through production.
- Risk service contracts – the IOC bears all the exploration costs.
- Petronas retains ownership of oil.
- The Internal Rate of Return (IRR) is estimated at between 7 – 20% subject to terms and conditions as compared to at least 25% for conventional oil fields[17].
- Contractor receives fee payment commencing from first production and throughout the duration of the contract.
- Fee is subject to taxes – but to incentivise investment in marginal fields Malaysia has reduced tax for from 38% to 25%, to improve commercial viability of investment projects.

Chapter 3: Methodology

The following figure describes the methodology of this project:

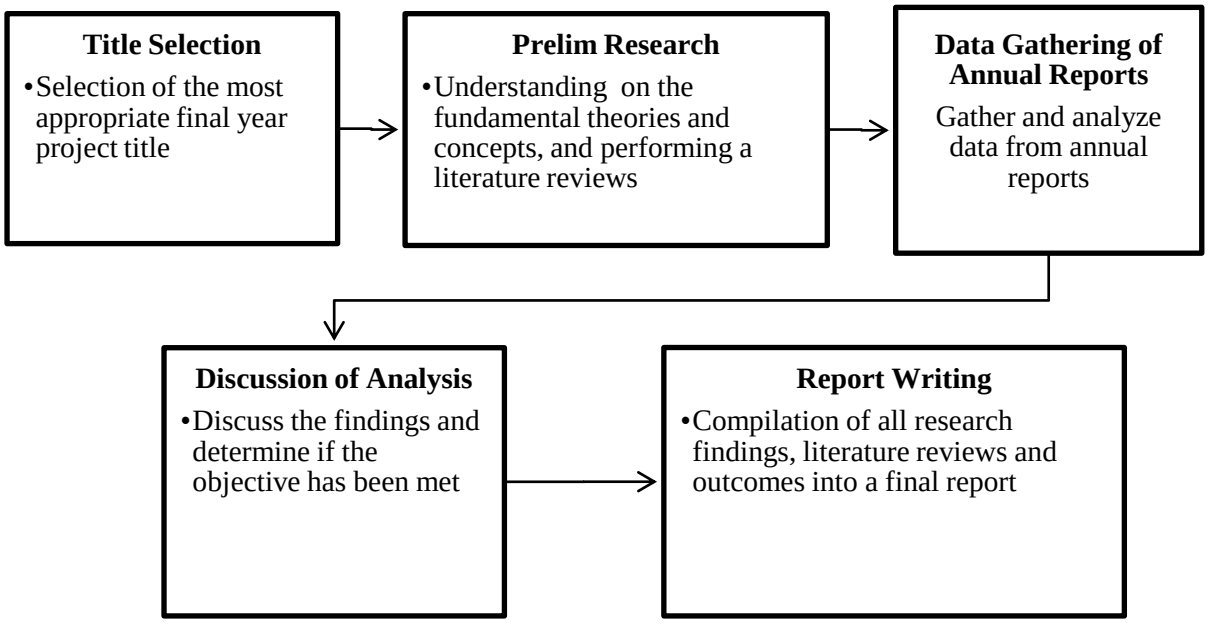


Figure 3

Based on the diagram, this project will emphasize on research works regarding marginal field economics. After the title selection, preliminary research will be done. During this stage, the background of the problem is identified and literature reviews are conducted to gather as much information as possible regarding the topic.

Next, the procedure for analyzing local companies will be as follow:

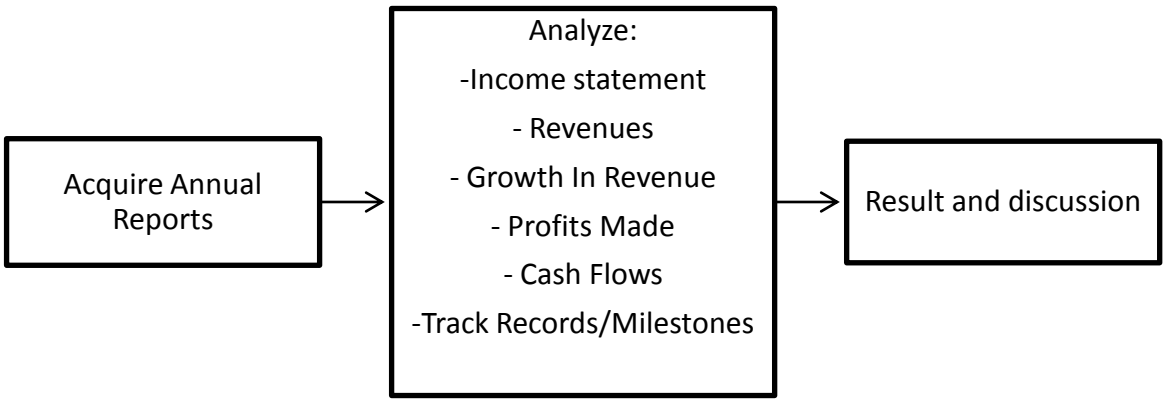


Figure 4

- Income statement shows the transactions completed over a specific accounting period. In this statement, we have three key pointers: the current level of revenue; high growth in revenue; and the profits made in proportion to the level of revenue.

- Revenue indicates the size of a company. Growth in revenue implies that the company has been expanding over the past period.

- The profits made in proportion to the level of revenue indicate whether this company has high or low profit margins in its products. The profits here refer to the profit after tax or net income.

- Cash flows of a company need to be analyzed to determine whether the company is generating cash from its activities. A healthy company should show high operating cash flow because this number will indicate how much actual cash the company has generated from operations during the period.

- Track record describes the performance history of a company and it allows us to investigate on the company's experience in conducting their business.

Project Gannt Chart

Table 5: FYP I Gannt Chart

No.	Details/Week	1	2	3	4	5	6	7	8	9	10	11	12	13
1	Topic Selection/Proposal													
2	Preliminary Research Work													
3	Project Flow Planning													
4	Submission of Proposal Defense Report													
5	Project research (Literature Review, Data Gathering)													
6	Oral presentation													
7	Submission of Interim Draft Report													
8	Submission of Interim Report													

Figure 8: FYP II Gannt Chart

No.	Details/Week	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16
1	Project work continues																
2	Submission of Progress Report																
3	Project work continues																
4	Pre-EDX & Submission of Final Report (Soft bound)																
5	EDX																
6	Final Oral Presentation																
7	Submission of Technical Paper																
8	Submission of Dissertation (Hard bound)																

Key Milestone

Table 7: FYP I Key Milestone

No	Activities	Date
1	Submission of Proposal Defense Report (Prelim)	3 Nov 2011 (W6)
2	Proposal Defense (Oral Presentation)	15 Nov – 25 Nov (W8-9)
3	Submission of Interim Draft Report	15 Dec 2011 (W12)
4	Submission of Interim Report	22 Dec 2011 (W13)

Figure 10: FYP II Key Milestone

No	Activities	Date
1	Submission of Progress Report	16 Mac 2012 (Week 8)
2	Pre-EDX & Submission of Final Report (Softbound)	2 April 2012 (Week 11)
3	EDX	9 April 2012 (Week 12)
4	Oral Presentation	23 April 2012 (Week 14)
5	Submission of Dissertation	11 May 2012 (Week 16)

4. Result & Discussion

4.1 Comparative Analysis between PSC and RSC

The comparative analysis between PSC and RSC can be divided into several factors which are development cost and excess development cost, technological advancement, production sharing, and upside and downside risks.

In terms of development cost, both the operator and contractor will provide the capital cost for development as agreed in the PSC fiscal agreement. Should the project require more cost than as planned, it will be shared between the operator and contractor. The higher cost required may be due to changes in development activities, such as fabrication/transport costs. However, in RSC the development cost and excess development cost are fully provided by contractor.

Furthermore, PSC also encourage the contractor to enhance their technology to optimize production under PSC since the risks are shared in cost recovery terms. In RSC, the capital allowance of between 60%-100% also encourages the technology enhancement such as Enhanced Oil Recovery (EOR) and High Pressure High Temperature (HPHT) [16].

Next, the production revenues under PSC model determine the profit oil sharing which has been described earlier. For example, the profit oil split is 40% (to contractor) and 60% (to government). On the other hand, production revenues in RSC model determine the remuneration fees for contractor.

Other than that, the upside and downside risk under PSC are shared between operator and contractor. The example of downside risk is the actual reserve recovered. For example, if the actual reserve recovered from the reservoir is less than expected, the risk is shared between both. Under RSC, the contractor bears a higher risk in terms of less remuneration fees if the production is not up to their target. Other than that, upside risk such as oil price also affects the contractor's profit.

The comparative analysis is simplified in the following table:

Table 9: PSC and RSC Comparative Analysis

Comparison	PSC	RSC
Development Cost	Shared among operator and contractor	Fully by contractor
Excess development cost	Shared	Fully by contractor
Technology	Contractor may enhance technology application due to cost recovery	High capital allowance encourage the contractor to use enhanced technology
Production revenues	Determines profit-oil sharing	Determines the remuneration fee for contractor
Upside and Downside Risks	Shared	Contractor bears greater risk – affect remuneration fees

4.2 Drawbacks of RSC Model

Firstly, contractor has to deal with greater risk under RSC model since they have to deal with development and operation cost. They also have to bear the upside and downside risks. On the contrary, PSC enable the sharing of risks due to existence of cost recovery and profit-oil mechanism.

Next, the RSC model also has a short contract life. In Malaysia, RSC is planned to be implemented up to 15 years only which is much shorter than PSC implementation. The short life will not motivate the contractors to implement measures to maximize life of field. In other words, the contractors will not focus on reservoir performance in the long run.

Furthermore, one of the reasons for PETRONAS to include local contractors in partnership with foreign companies is for technology transfer. However, the short contract duration in RSC will limit the technology transfer and local companies may not be able to learn much from foreign players. This is contrary with PSC where local companies are given much longer period to collaborate with foreign companies.

4.3 Info and Data Analysis: SapuraCrest Petroleum & Kencana Petroleum

4.3.1 Background and Experience of Local Companies

The background and experience of local companies that are involved as operators of marginal fields (SapuraCrest and Kencana Petroleum) are analyzed by dissecting these companies' annual report. (Refer Appendices for further reference)

SapuraCrest Petroleum

SapuraCrest Petroleum is a local service provider company that has been involved in shallow and deepwater hydrocarbon production. The company's current major involvement is the deepwater offshore installation works at Gumusut-Kakap field in Sabah after the success of Kikeh development project. Another project by this company is the decommissioning project in Japan (Iwaki Platform). SapuraCrest also had succesfully undertaken the transportation and installation project of offshore facilities in Australia. Furthermore, SapuraCrest had also involved in drilling activities where it is currently operating five drilling rigs owned by ExxonMobil and PETRONAS Carigali Sdn Bhd. Besides, the company also provided services in offshore platform maintenance services such as geotechnical and geophysical surveys and hook-up & commissioning.

Kencana Petroleum

Kencana Petroleum is a local service provider involved in fabrication, hook-up & commisioning, procurement, and construction of offshore facilities. The company had involved in fabrication works for Newfield's processing platform and Gorgon LNG plant for Saipem France. In drilling activities, the company had also started a drilling service contract with PETRONAS Carigali Sdn Bhd. Moreover, the company had also strengthened its capabilities in subsea components fabrication after the acquisition of Allied Marine & Equipment (AME) where they cover provision of offshore diving and underwater-related services such as construction, repairing, and installation. Most of the company's revenues are generated from fabrication contracts.

4.3.2 Financial Data Gathering

Company	Revenue (RM Million)			Profit After Tax (RM Million)		
	'09	'10	'11	'09	'10	'11
SapuraCrest Petroleum	3,451.7	3,257.0	3,180.0	249.8	335.3	374.5
Kencana Petroleum	1,141	1,090	1,493	118	136	223

Table 10: Financial Data

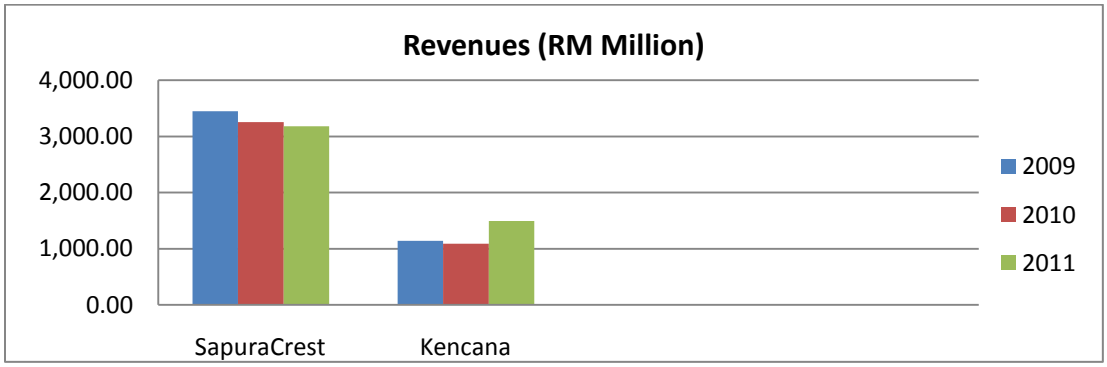


Figure 5

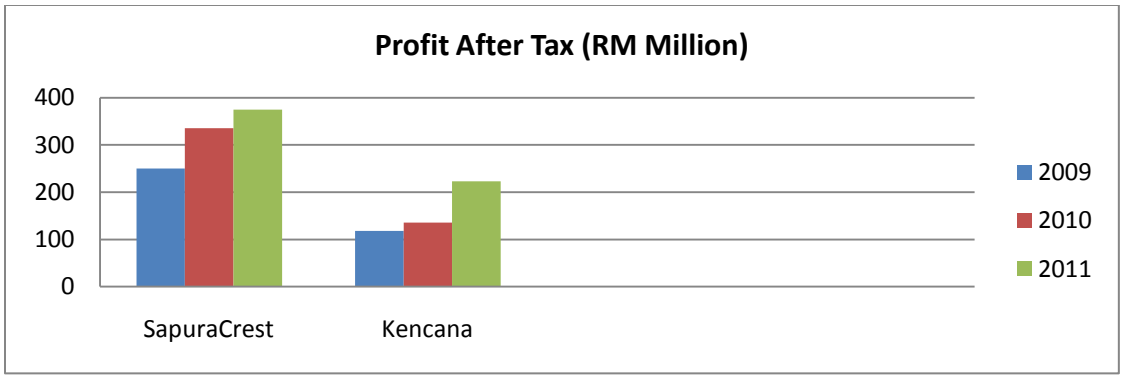


Figure 6

4.3.3 Discussion

The involvement of SapuraCrest Petroleum and Kencana Petroleum as marginal field operators raises the issue of these companies' capabilities to be field operators. In terms of experience, both companies have wide experience in fabrication and hook-up & commisioning (HUC) projects. However, both companies have no experience as field operators and their competencies as operators are questionable.

Moreover, both companies are succesful as service providers due to PETRONAS' policy to include local contractors in PSC projects. Hence, higher service cost will be compensated by PETRONAS as the owner of the PSC. It is a differenct case in RSC implementation where both companies are operators and they need to provide all the costs related to the development project before remuneration period. The operators may need the technology and expertise to determine the optimum production levels. The risks exposed to operators are significantly high since they need to strictly meet key performance indicators (KPI) such as production rate and production capacity. Should the KPIs are failed to be met, operators will face serious consequence such as penalties or no remuneration fee. The worst case will happen if the operators are not compensated since they have invested their own money for the project and this leads to negative cash flow (loss).

Furthermore, according to the financial data both companies are making profit consistently since year 2009. However, both companies need to provide the development capital amounting to RM600 million each which is relatively high as compared to their yearly profit. The invesment is really aggressive towards the operators since there is risk of not getting compensated as described previously. Hence, the financial capabilities of the operators are disputable.

5. Conclusion

In conclusion, the implementation of RSC in Malaysia for marginal fields' development still needs further consideration due to several reasons. Firstly, the competencies of local companies to be operators are disputable. Secondly, the comparative analysis shows that the risks exposed to local companies (contractors) are significantly higher than that of PSC model. Lastly, RSC model is too rigid to be implemented because it is insensitive to oil price and changes in found reserves.

Furthermore, PETRONAS should reveal more regarding the RSC model in Malaysia to allow more in-depth research to be conducted. Increased transparency will enable the researchers to investigate and provide alternative modifications to the RSC model.

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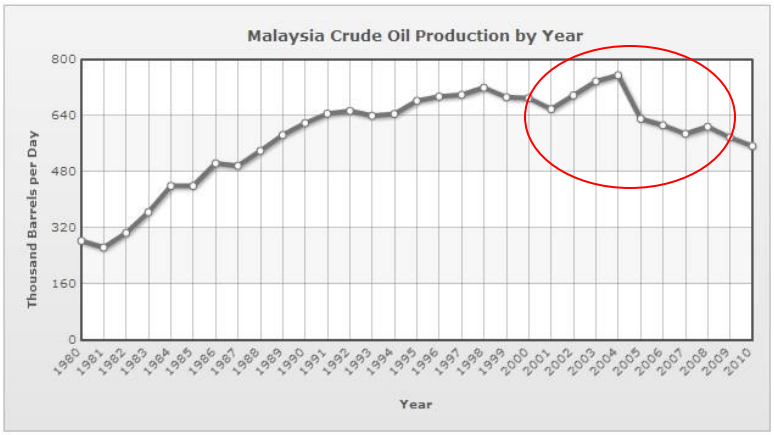
Appendices

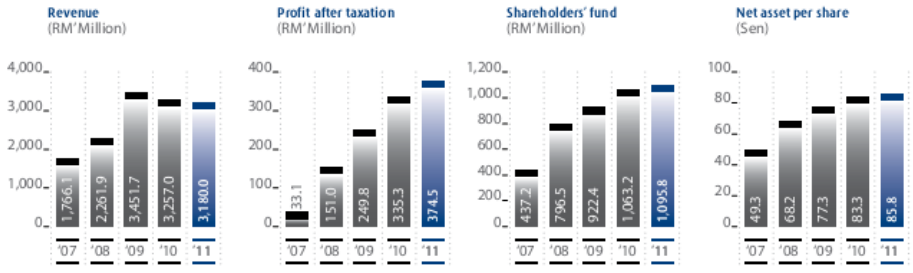
1. Malaysia Crude Oil Production (MMbbl/day)



Source: http://www.indexmundi.com/energy.aspx?country=my&product=oil&graph=production

2. SapuraCrest Petroleum Financial Highlights

FINANCIAL HIGHLIGHTS



		31 January				
		2007	2008	2009	2010	2011
Revenue	(RM'mil)	1,766.1	2,261.9	3,451.7	3,257.0	3,180.0
Profit after taxation	(RM'mil)	33.1	151.0	249.8	335.3	374.5
Profit/(Loss) attributable to equity holders of the Company	(RM'mil)	(17.7)	78.3	115.8	172.0	231.4
Shareholders' fund	(RM'mil)	437.2	796.5	922.4	1,063.2	1,095.8
Basic earnings/(loss) per share	(sen)	(2.0)	7.5	9.8	13.6	18.1
Diluted earnings/(loss) per share	(sen)	(2.0)	6.6	9.1	13.6	18.1
Net asset per share	(sen)	49.3	68.2	77.3	83.3	85.8
Number of ordinary shares at financial year end	('mil)	887.1	1,168.4	1,193.8	1,276.7	1,276.7

3. Kencana Petroleum Financial Highlights

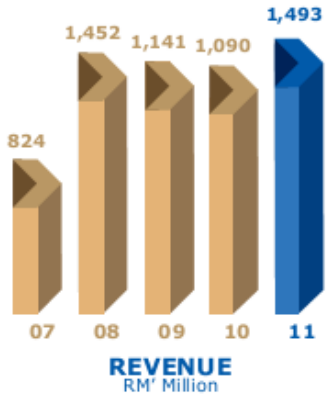
Financial Performance

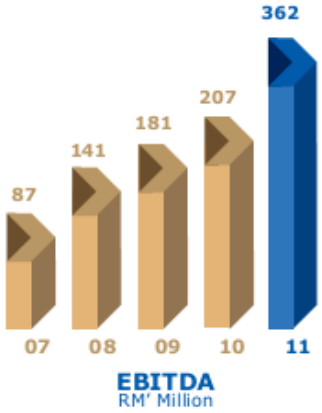
+37.0%
Revenue
RM1,493 million
2010: RM1,090 million

+74.9%
EBITDA
RM362 million
2010: RM207 million

+54.2%
Gross Profit
RM370 million
2010: RM240 million

+58.7%
Profit Before Tax
RM273 million
2010: RM172 million





+64.0%

Profit After Tax
RM223 million
2010: RM136 million

12.7%

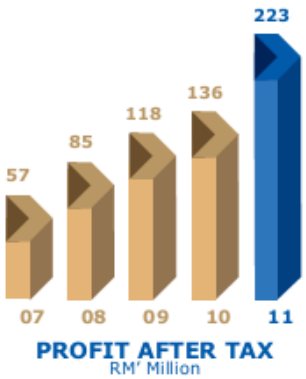
Return on Equity
2010: 18.1%

+84.7%

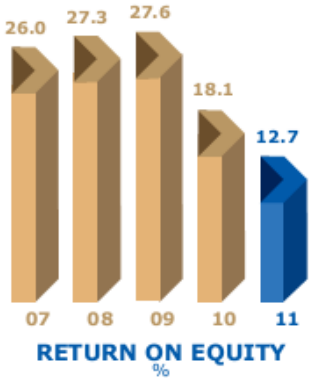
Net Tangible Assets
RM1,323 million
2010: RM716 million

0.5x

Gearing Ratio
2010: 0.3x



PROFIT AFTER TAX
RM' Million



RETURN ON EQUITY
%