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Full Length Research Paper

Financial Appraisal of Layer Production in Peninsular Malaysia

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In Malaysia, egg production is a crucial necessity that the demand proceeds tremendously to the society. Due to the lack of food supply and the farmers are still not be able to get more profit, several agricultural policies have been introduced by Malaysian government in order to additionally boost the performance of agricultural sector and fulfill the government's target to reach closely self-sufficiency. One of the common scheme of government incentives is offered by reducing the tax obligation from the income statement that usually imposed to the commercialized company. Nevertheless, less information of promoting on tax scenarios, ineffectiveness of applying the incentive program and scant encouragement to potential investor are still remain untouched. Therefore, the main objective of this study is to investigate the role of government incentives in effecting project assessment of layer industry in different technology. The indicators of capital budgeting analysis namely Net Present Value (NPV), Internal Rate of Return (IRR), Profitability Index (PI) and Payback Period (PBP) are explained to illustrate financial appraisal. The study reveals that the layer firms which involve in the open and close systems are financially viable to be a proposed project. Moreover, the industry represents extremely financial attractiveness and rapidly recover its financial investment where the government provides incentives as tax exemption.

Keywords: Government tax incentives, capital budgeting analysis, close-open system, layer production, Peninsular Malaysia.

JEL Classifications: G310

INTRODUCTION

Layer production supplies tremendous benefits in daily meals with a huge source of protein, nutrients and health purpose. In the global market, the demand of layer (hens) is highly responsive, layer production approximately increased from 51 to 64 million tons annually from the year of 2000 to 2010 (Poultry Site, 2013). Wattagnet, (2011) illustrated that 6.4 billion of hens are increased in order to produce 51.2 million tons of egg. Roughly, 6556 million layers (hens) are estimated in world production, Asia continent donates higher production as 4211 million.

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Followed by Americas (1053 million), Europe (765 million), Africa (509 million) and Oceania (18 million) respectively (Poultry Site, 2013). China as the largest world producer generates individually about 27.1 million tons in 2010. Where, Brunei constitutes as the highest individual egg consumption as about 1 person consumes 57.52 kg per year. Followed by Denmark and Japan. In Peninsular Malaysia, the production of table eggs increased from 7.6 billion in 2009 to 8.57 billion units in 2010. In the same time, the country also produced 0.85 million fertile eggs and exported to Brunei about 59%. The production of table eggs is initially distributed about 86% to the domestic consumption and the rest about 14% are mainly exported to Singapore in 2010 (Smith, 2011).

In term of cost production, the high cost of layer production is worrisome. The instruments of fixed and variable costs effects to the number of egg outputs. According to Van Horne, (2013) the highest cost of egg production in the global market occurred because the compound of feed expenses, global legislation, ban on cage, anomaly circumstances. Furthermore, the feed is the main expensive inputs in layer production, the portion of feed in the total egg production may reach about 70%. In Malaysia, Ariffin et al. (2014) studies that cost of feed contributes significantly to any challenges in egg production. Hereby, he generates the feed cost consumes 70 % of total expenses. Therefore, the high cost of feed may be a burden in the farm operation. Raghavan et al. (2012), emphasized that the feed adulteration has been applied in the quality control issues to reduce the high cost of feed. Moreover, the shifted technology in using house structure of layers to enrich cage more efficiency and effective in the production, creates the additional costs and gaps between open and close system. However, this adapted technology will effect to the cost and revenue of egg production (Van Horne, 2013).

In spite of the investment in layer production in Malaysia, the information of the financial appraisal is very limited and the information of government protection in providing incentives to the agricultural commodities is not highly acquired. Since the Malaysian government introduces some incentives to the agricultural products as tax waiver. Tax incentive is applied to reduce the burden of tax in the year of income statement to the commercialized agricultural farms. This tax scenario will assist agricultural companies to gain more profit and encourage the massive production. Therefore, regarding about the limited scenario of the government incentive in the project appraisal and the cost problem of layer production especially in the feed instrument and adopted coop technology, the study aims to investigate the effect of government incentives to the financial projection of different adapted technology in layer production, with case study in Peninsular Malaysia. Moreover, the study also applies sensitivity analysis, in order to illustrate the shifting cost in the project appraisal.

Literature Review

The analysis of financial projection illustrates the useful information of firms' profitability, return, and cost-benefit in long-term assessment project. The instruments of project appraisal mainly includes market price for layer resources, labor cost, and other inputs in involving the chain of cost operation.The valuable output of financial assessment provides an informative access to select the viability of the project. The capital budgeting provides a pivotal role in the firm assessment. Gitman (2007), defines that capital budgeting techniques uses as method to evaluate the investment criteria. Arya et et., 1998) emphasizes that the techniques may assist to select properly the project with a highest profit and minimize the risk. Once a business applied capital budgeting techniques, may be more effectively to notice a feasible mechanism during the project appraisal and gain better competitive to rivalries (Lazaridis, 2004).The main indicators of capital budgeting techniques are Net Present Value (NPV), Internal Rate of Return (IRR), Benefit Cost Ratio (BCR) and Payback Period.

According to the Malaysian Industrial Development Authority (2006), the Government introduces several incentives to encourage investment and increasethe output of the agricultural, manufacturing and service sectors to improve the GDP. In Agricultural sector, the company which relates to the agro-based cooperative societies, associations, sole proprietorships and partnerships, attains to tax waiver. The tax incentives are Pioneer Status (PS), Invesment Tax Allowance (ITA), Accelerated Capital Allowance (ACA). Pioneer Status provides a partial exemption from company's income tax. Its incentives offer payment of 30% tax from statutory income for five years. On the other hand, Investment Tax Allowance (ITA) grants the agriculture firms to offset the allowance against 70% from statutory income in the year of assessment and any unutilized allowance may be carried forward to subsequent year till fully utilized. Then, Accelerated Capital Allowance (ACA) applies a slightly different procedure that provides the contribution of depreciation cost as 60% in the first year and about 40% for the second and third year. In general, the incentives suggested the combination scenarios between ACA on PS or ACA with ITA, in order to gain more profit.

MATERIALS AND METHODS

The study initially uses primary data and distributes questionnaires via face – face interview with the commercialize layer-farm management in Peninsular Malaysia. The area of farms includes Kedah, Penang, Selangor, Negeri Sembilan, Malacca and Johor. The main reason of selecting the area refers to the major layer

production in Malaysia. The source of data collection includes basic financial data of input-output costs, farm initial investment and income statement from the farm operation. The study applies a multi-stage sampling as cluster sampling and simple random sampling. Thus, the sampling frame of study employs about to 96 layer commercialize farm-management.

Capital budgeting technique is applied as data analysis in this study. The indicators of the capital budgeting techniques are Net Present Value (NPV), Internal Rate of Return (IRR), Profitability Index (PI), and Payback Period. However, those instruments are common tools in assessing financial viability of the industry. The applied discount rate is 10 % to determine a time value of money to the cost of capital during the project assessment. Then, the implication of government tax incentives is implemented in the farm's project appraisal to determine the impact of the incentives to the viability of the industry. The instruments of financial analysis are shown in the following mathematical expression below:

1. **Net Present Value** has known as the discounted cash flow technique. NPV is the frequent instrument, relating the gain of companiesduring the project assessment.NPV may be a good option for the potential investor in determining the decision criteria. Sayed et al. (2013) explain that Net Present Value illustrates the available cash to earn profit in the project. The negative value of NPV means the cost exceeded the benefit and the project is not financially viable. The following formula illustrates as:

$$NPV = \sum_{t=0}^{N} \frac{CF_t}{(1+r)^t} \qquad (1)$$

Where,
CF = Cash Flow
r = Discount Rate
t = Time

2. **Internal Rate of Return (IRR)** the IRR refers to the value of the discount rate; the net present value of the project equal to zero. Same as NPV, Internal Rate Return (IRR) is frequently used to the project appraisal and demonstrated the profitability of project. The determination of the value is very apparent for the investors to digest the future appraisal. If the value of IRR is higher than discount rate, means the project is acceptable and less risks. (Mackevicius and Tomasevic, 2010).

$$NPV = \sum_{t=0}^{N} \frac{CF_t}{(1+IRR)^t} = 0 \qquad (2)$$

Where,
CF = Cash Flow
r = Discount Rate
t = Time
IRR = Internal Rate of Return

3. **Profitability Index (PI) or Benefit Cost Ratio (BCR)**– The profitability index calculates the value of the cash flows project divided by the initial cost investment. PI indicates the present value of the cost project. PI illustrates the potential earning of the project in investing amount of money to the project. Furthermore, PI evaluates the efficiency of a project investment. If the value of PI is greater than 1 means a proposed project considers to be lucrative and may generate profit. (Satyasai, 2009).

$$PI = \frac{PV\ of\ future\ cash\ flows}{Initial\ cost} = \frac{\sum_{t=0}^{N} \frac{CF_t}{(1+r)^t}}{CF_0} \qquad (3)$$

Where,
CF = Cash Flow
r = Discount Rate
t = Time
PV = Present Value

4. **Payback Period –** In order to recover the amount of money invested in the project, the role of Payback Period is very useful to predict this circumstance. The payback period illustrates the number of years to obtain the fixed cost. The shorter value of PBP indicates that the project may a great liquidity. Bordman et al.,(2006), defines that the PBP is considerably essential to decide the acceptability of an investment project and highly determine the time period to get back the cash resource in financing the project. Payback period can be calculated by :

$$Payback\ Period = \frac{\text{Initial Investment}}{\text{Periodic Cash Flow}} \qquad (4)$$

RESULTS AND DISCUSSION

Descriptive analysis

Table 1 below presents the condition of socio-economic distribution of egg farm in Peninsular Malaysia. Accordingly, 96 egg farms are observed on this study with the average of available area is about 22.8 acre to generate the number of coops. Thus, by allocating the land size of 22.8 acre, approximately the business may apply 19 coops to produce the eggs. In a year, the farms may averagely result 28,672,402 eggs and estimated cost per an egg is initially 20 cents. This table, however, also illustrates the different technology of coop's system which divided by 2 approaches as open and close systems. Open system constitutes as a higher distributional percentage on this study as 75%. Followed by close system is solely 25%.

Table 1: Social Economic of Layer farms

Variables	Values
Number of farms	96 farms
Land size (average)	22.8 acre
Number of coops (average)	19 coops
Total eggs per year	28,672,402
Estimated cost per egg	20 cents
Coop types	
• Open systems	75.0%
• Close systems	25.0%
Year of operating farms	
• Less than 5 years	16.0%
• 5 year to 10 years	19.0%
• More than 10 years	64.0%
Age of owner	
• Less than 30 years old	14.0%
• 31- 40 years old	19.0%
• 41-50 years old	27.0%
• 51 years old above	41.0%

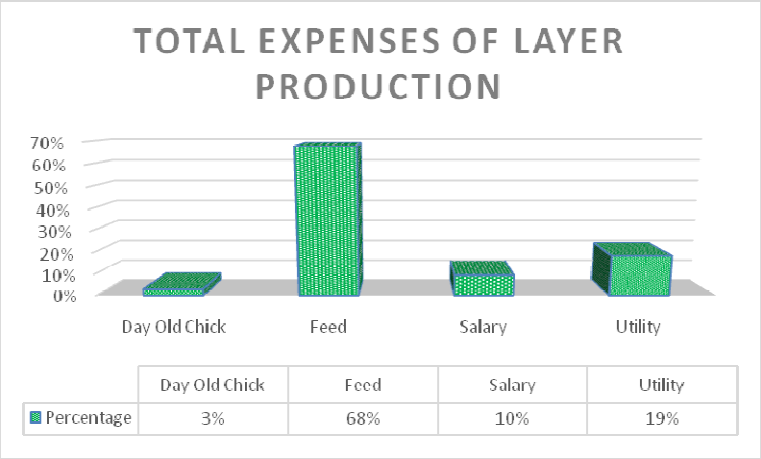


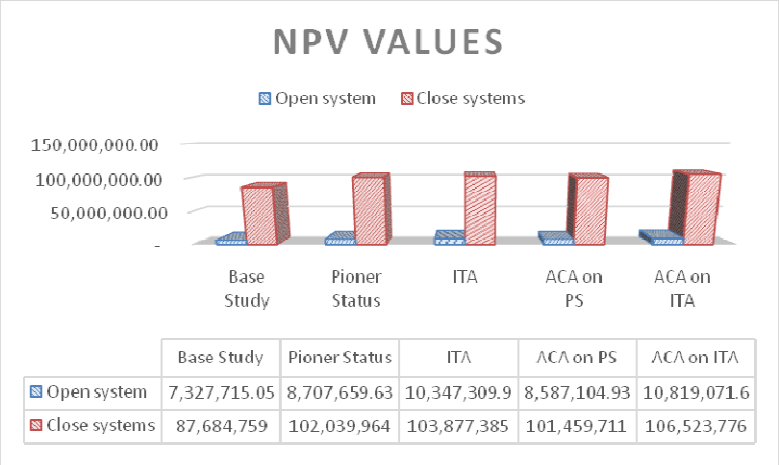
Figure 1: Distribution of cost percentage

Regarding about year experience, majority of the farm has been built more than 10 years, constituting 64% and only 16% register as a new comer in this industry. Furthermore, most of the owner of the farms are mature business man as 41% categories the number above than 51 years old and only 14% is a young entrepreneur.

The illustration of cost production of egg farms is presented by figure 1. The costs are divided into three categories as the major inputs in monthly expenses to produce output as eggs. Based on the figure, it assumes that the feed cost constitutes as a higher expenditure in layer production as 68%. This circumstance, however, may be significantly sensitive to the cost production if the shift of feed cost is happened during the farm's operation. Moreover, the utility cost denotes 19% as the second high cost of farm's input. This shape may be argued by the reason of applying tremendous usage of electricity and maintenance either in the close and open systems. Then, the contribution of paying salary and purchasing day old chick are not highly impacted to the total expenses since the accumulated donation of those figures result less than 15%.

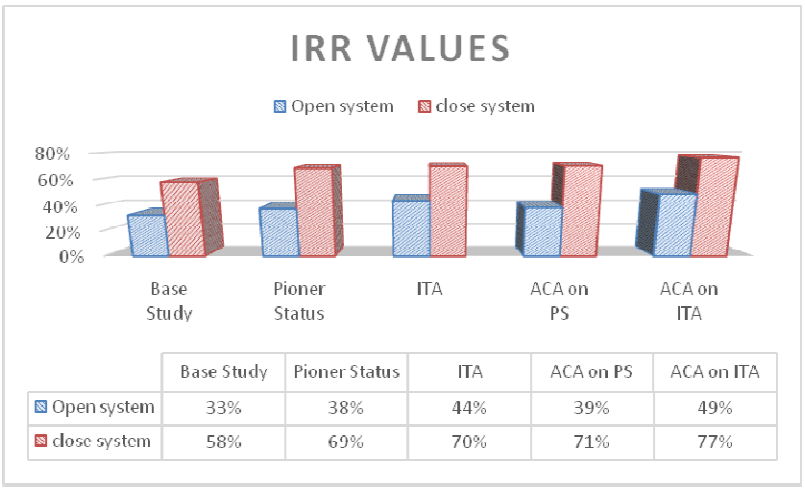
The role government incentives to the project of layer production in open and close systems

The figure 2 below explains the outcome of Net Present Value (NPV) to the financial appraisal of egg production in



	Base Study	Pioner Status	ITA	ACA on PS	ACA on ITA
Open system	7,327,715.05	8,707,659.63	10,347,309.9	8,587,104.93	10,819,071.6
Close systems	87,684,759	102,039,964	103,877,385	101,459,711	106,523,776

Figure 2: NPV results

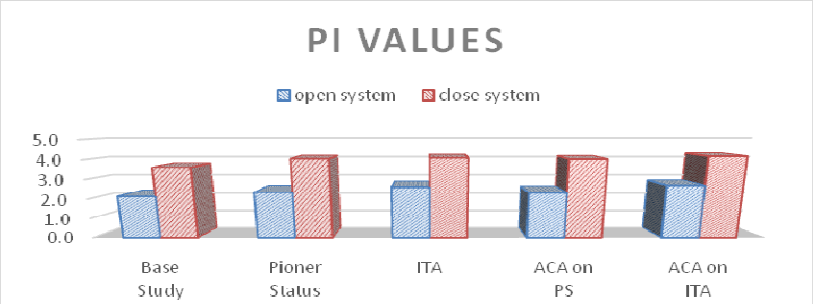


	Base Study	Pioner Status	ITA	ACA on PS	ACA on ITA
Open system	33%	38%	44%	39%	49%
close system	58%	69%	70%	71%	77%

Figure 3: IRR results

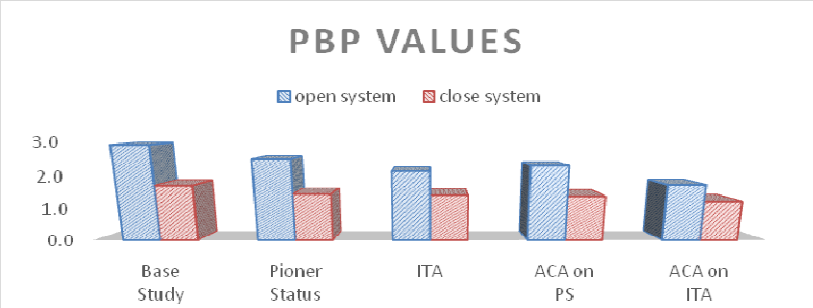
Peninsular Malaysia. In this stage, the results are divided by describing the two different adopted technology in the coop usage namely close and open system. Based on the initial results without tax incentives, the both outcomes of open and close systems are positive cash. It assumes that project of egg industry may generate profit during the project assessment. The results are also illustrating the value of close system is higher than open system, indicate the close one distributes enormous costs and revenues during the farm's operation. Furthermore, the introduction of tax incentives to the farms creates highly profitable project to the layer's industry. Those schemes as Pioneer Status (PS), Investment Tax Allowance (ITA) and Accelerated Capital Allowance (ACA) improved significantly the value of NPV. Those outputs provides similar patterns that the combination schemes between ITA and ACA are more achieving higher profitable cash to the open and close system. Followed by PS with ACA, Independent ITA, and PS respectively.

Figure 3 presents the value of IRR with the analyses of non-tax and tax incentive schemes. The non-tax incentive (base study) results percentage more than 10% from the discount factor for open and close system. It can be assumed that the project may have a little risk to be long-project assessment and the benefit of the operation project will distribute proper income. Furthermore, the close system constitutes as higher value of IRR comparing with open system as 58%. It indicates that by using the closed-coop technology in layer production, the chance to provide higher benefit and minimize the company risk during the long term project appraisal is visible. Moreover, based on the tax incentive scenarios, all the value of IRR are significantly improved after the incentives of tax waiver are applied. Then, in order to provide more viability of the egg project, the farms should select the scheme of ACA with ITA which contributes as a higher value to both systems. This result, however, has similar pattern with NPV, this tax



	Base Study	Pioner Status	ITA	ACA on PS	ACA on ITA
open system	2.2	2.4	2.6	2.3	2.7
close system	3.6	4.1	4.1	4.0	4.2

Figure 4: PI results



	Base Study	Pioner Status	ITA	ACA on PS	ACA on ITA
open system	2.9	2.5	2.1	2.3	1.7
close system	1.7	1.4	1.4	1.4	1.2

Figure 5: PBP results

scenario is proper to attain the high profitability of the layer project.

According to the outputs of Profitability Index (PI) with base period and tax incentives scenarios are indicated in figure 4. Profitability Index determines the exact amount of profit from the money that the potential investor invested. In terms of profitability index of base period in open system (2.20) means the viability of the project; that the project can earn 1.20 cents per 1RM invested in the project; indeed, lucrative. Then, the close system (3.60) indicates higher profit than the open system, meaning the farm in close coop can attain RM 2.60 for 1RM invested. Furthermore, in terms of the respective of tax scenarios, the applied tax exemptions are consistently show better viability; the ITA on ACA as the most gainful project with gaining profit in the open and close system are RM3.20 and RM 1.70 respectively per RM1 invested on cash return. It is followed by the other tax scenario as ITA, PS and PS on ACA respectively.

Figure 5 compares the open and close system in terms of effects of non-tax and government tax incentive scenarios for payback period in layer production. The Payback Period (PBP) indicator of non-tax incentive (base study) in open system shows 2.90; this assumes that the egg project may recoup its initial investment during less than 3 years operation. On the other hand, in order to receive the capital invested less than 2 years of operation, the close system may be a very lucrative model to apply in the layer farm. Moreover, relying on time of capital invested, but most agricultural projects require more than 5 years to payback their capital investment, thus, both of the open and close egg farming appears to be a visible choice to recoup swiftly fixed expenditure. Then, regarding to the tax incentives scenarios, similarly with the other indicators that the combination of ACA on ITA tax incentive results the least payback period of open and close systems are about 1.7 and 1.2 years respectively to recover invested capital. Thus, the necessity for egg farm to explore this

Table 2. Sensitivity analysis

Simulation		Situation 1 (cost of feed)		Situation 2 (cost of utility)	
	Normal value	**Increased by 20%**	**Increased by 40%**	**Increased by 20%**	**Increased by 40%**
Open system					
NPV	**7,327,715**	2,916,958	-1,493,798	7,080,428	6,833,141
IRR	**33%**	20%	4%	32%	31%
PI	**2.15**	1.46	0.76	2.11	2.07
PBP	**2.89**	4.03	8.36	2.95	3.01
Close System					
NPV	**87,684,758**	81,413,811	75,142,864	86,450,923	85,217,087
IRR	**58%**	55%	52%	57%	57%
PI	**3.62**	3.44	3.25	3.59	3.55
PBP	**1.71**	1.80	1.90	1.72	1.74

Note:
Situation I : Increasing feed cost
Situation II : Increasing utility costs

scheme is suggested for better cash flow and financial viability.

Sensitivity analysis

In project appraisal, in order to predict any shifted situation in the market distortion is very essential to illustrate sensitivity analysis. This approach is also useful to minimize the level of risk in evaluating decision of project assessment that may be a recommendation to the manager or policy makers. The change of error in the investigation of potential shift and the effect of the value in any economic model may create a parameter implication through the role of sensitivity analysis (Pannell,1996).In this study, the change of costs appraise the financial indicators of the layer project assessment is defined in Table 2. The study proposed the modification of shifting the feed and utility expenses since those costs are constituted as the major expenditure of project operation in layer farms. The simulated increment percentages are applied by 20% and 40%.

Based on the result of Table 2, if the feed cost increased by 20% to the open and close systems of layer farm, the indicators of financial assessment are still maintained in the lucrative appraisal. For instance, the change of IRR value for open is shifted from 33% to 20%, whereas the close system is slightly decreased by 3% from the normal value of IRR. Then, when the increment of feed inputrises by 40%, the dramatic change occurs to the open system; the industry serves asworsening viability; the value of NPV is negative, IRR shows below than discount factor and the industry may not earn profit in terms of PI. Conversely, by increasing the feed cost (40%), the close system is still in the line of profitable project appraisal. The IRR show a decrement from 58% to 52%; indeed still lucrative. Furthermore, the result of second situation as increase of utility cost, both of open and close system are not acquiring a major problem once the electricity, maintenance of building, veterinary and other utilities gained by 20%. Even though, the expenses rise by 40%, the values of IRR in open and close systems are slightly decreased by 2% and 1% respectively.

CONCLUSION

The present study attempts to illustrate the role of government incentives in affecting the project appraisal of layer industry in different coop system, Peninsular Malaysia. The type incentives of government scheme is the exemption of tax obligation to the egg's commercial firms. The indicators of financial ratios applied as Net Present Value (NPV), Internal Rate of Return (IRR), Profitability Index (PI), and Payback Period (PBP). Without tax incentives, both of open and close systems in the assessment project are financially viable which is the close system attains more lucrative appraisal than open system. Furthermore, once the government served the sole-tax incentives as Pioneer Status (PS), Investment Tax Allowance (ITA), Accelerated Capital Allowance (ACA), the viability of the egg project is significantly enhanced. Likewise, the result illustrated that the layer farms in both of open and close systems may properly select the simultaneous tax-incentives as ACA on ITA in order to obtain a gained viability of financial projection. Furthermore, the open system is extremely sensitive in shifting the feed expenses while the close system may maintained properly during the feed cost problem. It

assumes that open system has a greater risk than close system for the long-term projection. Regarding to the change of utility cost, both different coop technologies are not exceptionally receiving the problem. Thus, the study suggested that Malaysian government should preserve consistently the incentive schemes, especially for the feed instrument as obtaining a higher value of the total cost production, and any change of feed cost is supremely effecting the viability of the project; mainly in the case of open system.

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