

THE PERFORMANCE OF THE MALAYSIAN PALM OIL INDUSTRY

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INTRODUCTION

The oil palm planted area in Malaysia grew tremendously during the past few decades. There has been a corresponding increase in the production and exports of palm oil. Earnings from palm oil increased during this period, clearly indicating the good performance of the industry.

The performance can be analysed by measuring several indicator variables and their past trends using an econometric model. Projections of the trends in the model provides a forecast of the future scenario of the industry. This paper describes the model and the forecast of the future performance of the industry.

METHODOLOGY

In an international commodity market, the price of a commodity is determined by the supply and demand factors which could also depend on other competing products. Due to the inter-dependence of these variables, a joint estimation of the direct effects and the interactive effects is required rather than individual direct estimation of the coefficients between the dependent and independent variables. To meet this requirement, an econometric approach will be adopted.

Table 1. Specification of the Model

1. MYIMPP0	=	f(CIFPOPR, MYBSPO, PRIRATIO, DUMMYIMP, MYPOPNI)
2. MYEDPO	=	f(CIFPOPR, WLDDEM, MYPRODPO, WLDPOPNI)
3. WLDDEM	=	f(SBOPR, WLDPOPNI, CIFPOPR)
4. MYDDPO	=	f(MPPLMOIL, DUMMYIMP, RMPPMOIL, MYPRODPO, MYPOPNI)
5. MPPLMOIL	=	f(MYESPO _{t-1} , SBOPR, MYPRODPO)
6. TSPO	=	MYIMPP0 + MYBSPO + MYPRODPO
7. MYBSPO	=	MYESPO _{t-1}
8. TDPO	=	MYDDPO + MYEDPO
9. MYESPO	=	TSPO - TDPO

Basically, this analysis will be based on Labys's (1973) work on the econometric market model. A refinement was made on his model as shown in *Table 1*. The model's specification of this analysis contains nine derived and inter-related variables in the form of equations. The first five equations in the table are structural in nature and require estimations for their coefficients. The other four are identities. Most of these variables can be used to measure the performance of the industry. *Table 2* shows the definition of the variables in the model. The appropriate estimation technique used is the Two Stage Least Squares Method which will estimate the equations jointly.

DATA AND ANALYSIS

Monthly data were used in this analysis for the period of January 1988 to August 1994, resulting in 80 observations. Sources of data were mainly from PORLA, the Malaysian Department of Statistics, the Oil World, and the Central Bank of Malaysia. Estimates were used whenever data were not available during the period.

Table 2. Definition of the Variables in the Model

1. MYIMPP0	=	Malaysian imports of palm oil,
2. CIFPOPR	=	CIF price of palm oil at Rotterdam,
3. MYBSPO	=	Malaysian beginning stocks of palm oil,
4. DUMMYIMP	=	Dummy variable for Malaysian imports of palm oil (0 for no imports, otherwise 1),
5. MYEDPO	=	Malaysian exports of palm oil,
6. WLDDEM	=	World demand for palm oil,
7. MYPRODPO	=	Malaysian production of palm oil,
8. SBOPR	=	Price of soya bean oil at Rotterdam,
9. WLDPOPNI	=	World population,
10. MYDDPO	=	Malaysian domestic demand for palm oil,
11. MPPLMOIL	=	Local price of palm oil,
12. RMPPMOIL	=	Real price of palm oil,
13. MYESPO	=	Malaysian ending stocks of palm oil,
14. TSPO	=	Malaysian total supply of palm oil,
15. MYESPO _{t-1}	=	Local ending stocks of palm oil lagged one year,
16. TDPO	=	Total demand for Malaysian palm oil,
17. MYPOPNI	=	Malaysian population.
18. PRIRATIO	=	Ratio of (MPPLMOIL/CIFPOPR)*(1/2.6)



Table 3. Estimated Structural Equations

1) Malaysian Imports of Palm Oil:		
MYIMPPO _t	= -36358 + 49309PRIRATIO _t - 0.01087MYBSPO _t	
	(1.33)	(-1.60)
	+ 20282DUMMYIMP _t	
	(6.9)	
RMSPE = >100%,		$\bar{R}^2 = 0.51$, D.W. = 1.3
2) Malaysian Exports of Palm Oil:		
MYEDPO _t	= 185419 - 220.73232CIFPOPR _t + 255.84236WLDDDEM _t	
	(-2.16)	(5.90)
	+ 0.22218MYPRODPO _t	
	(4.03)	
RMSPE = 11.0%,		$\bar{R}^2 = 0.61$, D.W. = 1.78
3) World Demand For Palm Oil:		
WLDDDEM _t	= -3455.12542 + 0.832633WLDPOP _t - 0.52334CIFPOPR _t	
	(27.21)	(-5.04)
	+ 0.26798SBOPR _t	
	(2.3)	
RMSPE = 4.40%,		$\bar{R}^2 = 0.93$, D.W. = 2.04
4) Malaysian Local Disappearance:		
MYDDPO _t	= 17928 + 19729DUMMYIMP _t - 20.915445MPPLMOIL _t	
	(2.78)	(-0.68)
	+ 0.114905MYPRODPO _t	
	(3.73)	
RMSPE = >100%,		$\bar{R}^2 = 0.50$, D.W. = 2.00
5) Local Price of Palm Oil:		
MPPLMOIL _t	= 659.07247 - 0.000359MYESPO _(t-1) + 1.44953SBOPR _t	
	(-8)	(6.98)
	+ 0.000382MYPRODPO _t	
	(-4.8)	
RMSPE = 8.9%,		$\bar{R}^2 = 0.61$, D.W. = 1.37

Note : Numbers in parantheses are *t*-values
RMSPE root mean square percentage error

RESULTS AND DISCUSSION

1) Analysis for the period of January 1988 to August 1994

The model will be best described by briefly looking at *Table 3* which shows the estimation of the inter-related structural equations. As a whole, it appears to fit the data quite well, as evidenced by the R^2 and *t*-values (*Table 3*). All of the estimated coefficients in the model have the expected signs.

The model reveals several good structural explanations for the relationships of the five variables. Firstly, imports will increase as the price ratio increases. This means that Malaysia will import palm oil (especially from Indonesia) as long as its CIF price is cheaper than its local price. The same effect will be realised if there is a drop in beginning stocks. The main reason for this is to maintain the total supply at a certain level so as not to worsen the existing over-capacity problem. Secondly, Malaysian palm oil will always be demanded as long as it is cheap, as evidenced in the past. Being the largest exporter of palm oil in the world, Malaysian

exports will also increase as there is an increase in the world demand for it. The third explanation is that as production increases, local as well as export demand for palm oil will tend to increase. The dependence of the local price of palm oil on its own ending stocks lagged one year, on its own production and on price of its competitor would be the last structural explanation of the model. As such, the price will increase as its stocks or production decreases. Conversely, the price is expected to move in the same direction as that of soyabean oil.

The model, as a whole, is tested for its ability to forecast during the historical period between January 1988 to August 1994. It can be seen that most Root Means Square Percentage Errors (RMSPEs) are low, meaning that the predicted values are closely following the actual ones during the study period (*Table 3*). The predicted values do not deviate much from the actual data and the turning points are quite well predicted by the model. This applies most to the local price, the exports and the world disappearance of palm oil since they have low RMSPEs of 8.9%, 11.0% and 4.4% respectively.

2) Forecasting for 1994

Using the coefficient estimates obtained in the above analysis, forecast for the whole of 1994 was carried out to see the palm oil's performance in this year. The performance can be observed in *Table 4* below in terms of its five inter-related variables. Actual data was also illustrated for these variables between January and August.

Malaysian exports of palm oil is expected to increase to 612 100 tonnes in September from the actual August exports of 575 257 tonnes (*Table 4*). The increase in exports will continue until October after which it is expected to drop slightly to 548 800 tonnes in December. Total exports this year of about 6.9 million tonnes is expected to surpass that of last year of about 6 million tonnes. This exports trend is expected to happen due to an increase in world demand for it. The cumulative total of local disappearance

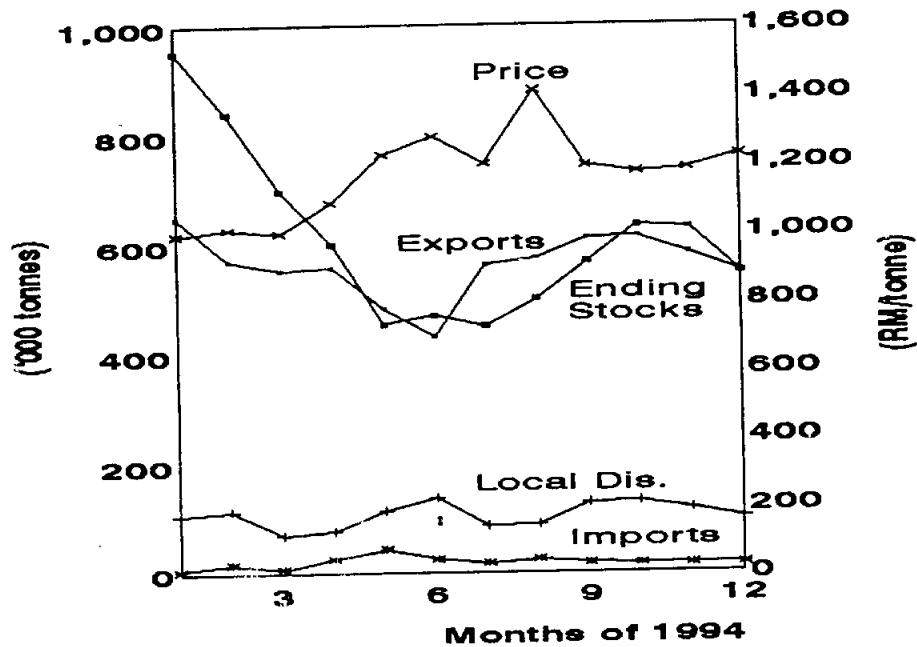
until August was well predicted by the model and was about 800 000 tonnes. The disappearance in future is expected to have a similar trend with exports between September and December and is decelerating. Imports too is predicted to drop from 24 769 tonnes in August to about 16 000 tonnes in December. The total imports by Malaysia for this year might also fall slightly to 200 000 tonnes from 240 459 tonnes last year. The whole future scenario may influence stocks and should bring it down to a low level. However, due to the peak production periods in September and October, the stocks level, on the other hand, is expected to increase to 635 000 tonnes in October from the August level of about 500 000 tonnes. The stocks is then estimated to drop to 548 000 tonnes at the end of year. All these factors (especially the stocks) may explain the reason why price is expected to drop in September and October to RM 1 190 and RM 1 170 per tonne respectively and to increase later in the last two months of the year (see also *Figure 1*).

Table 4. 1994 Performance of Malaysian Palm Oil *

Month	Exports (tonnes)		Local Dis. (tonnes)		Imports (tonnes)		End. Stocks (tonnes)		Price (RM/tonne)	
	Predicted	Actual	Predicted	Actual	Predicted	Actual	Predicted	Actual	Predicted	Actual
January	588300	650898	99200	108669	6100	6526	-	953941	1050	991.50
February	569300	572386	88500	115953	13200	18144	-	840859	1110	1008.00
March	576600	553657	91100	70607	15900	8534	-	699716	1190	995.00
April	574400	557681	95500	78170	18200	26374	-	601249	1210	1084.5
May	559100	484030	95800	114454	20200	43176	-	454595	1260	1223.00
June	564000	432491	101700	137285	21100	25867	-	470423	1230	1275.50
July	585000	562805	108600	86156	19000	17297	-	451174	1190	1194.50
August	581300	575257	116900	88629	19300	24769	-	500602	1230	1409.5
C/T (1-8)	4628700	4389205	797300	799923	133000	170667	-	-	-	-
Ave. (1-8)	-	-	-	-	-	-	-	-	1180	1147.68
September	612100	-	129800	-	18400	-	567900	-	1190	-
October	614900	-	130400	-	17100	-	634700	-	1170	-
November	583900	-	116200	-	15800	-	630300	-	1180	-
December	548800	-	100100	-	15900	-	548300	-	1220	-
Total	6988400	-	1273800	-	200200	-	-	-	-	-
Average	-	-	-	-	-	-	-	-	1190.00	-

Note : No prediction was made for stocks between January to July since stocks is an identity.
C/T cumulative total.

* As at 15 September 1994



Note: Actual : Jan - August
 Predicted : Sept. - Dec.
 * As at 15 September 1994

Figure 1. Past and Future Performance of Palm Oil*

CONCLUSION

The above results show that 1994 was a bullish year and palm oil would improve its performance from the previous year. Exports and local demand are expected to perform well that year and there would be an increase in the total demand for palm oil. But, the tight production and drop in imports of palm oil towards the end

of year will reduce the availability of palm oil in Malaysia. Under this scenario, stocks can be expected to remain at a steady level during the last five months of 1994, and prices to perform better than the previous year.



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