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Evaluation of Malaysia's Food Balance of Trade Plan: Achievement Rates

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Malaysia has always been a net food importer in the last four decades. In 2007, the deficit in the food trade was RM9.7 billion (USD2.9 billion). In 2002, Malaysia implemented a policy towards achieving a surplus balance of trade in food of RM1.2 billion (USD352 bilion) by 2010. This paper evaluates the policy in terms of the achievement rates of the plan. The analysis suggests that the actual trade data shows the intended targets are likely not to be met; in fact the deficit is expected to grow bigger with time. While the objective was commendable, the targets, rationales and strategies for such a plan require a serious rethinking.

JEL Codes: Q18

1. Introduction

The contribution of the agriculture sector to the Malaysian GDP has declined from about 23% in the 1980s to 7.7% in 2007 due to industrialisation of the economy. Despite the decline, its importance to the economy prevails in terms of providing employment (14.8% in 2007) and export earnings. The industrial crops sector (palm oil, rubber, cocoa) continues to be the back bone of the agriculture sector. Malaysia is the largest exporter of palm oil in the world and one of the major world exporters of rubber, cocoa and wood-based products. Over the years, Malaysia strengthened her comparative advantage in these commodities through various measures such as big public investments in infrastructures, R & D, and various supports and incentives. These industrial crops accounted for 83.7% of the land use in 2007 with palm oil alone accounted for 63.4%. Malaysia did not do well with its food sector due to the relative profitability of the industrial crops (in particular palm oil) and better return to resources for non- agricultural activities. In the last five decades or so, it relied on food imports as it was cheaper to do so and resources were better utilised for more profitable purposes. The share of food in total import value reduced from 10% in the 1980s to 4.6% in 2007. The food trade deficits however has widened from USD1.8 billion in 2000 to more than USD3 billion in 2007. The decision to import rather than produce food at home appears economically correct until crises struck the country.

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Being dependent on imports makes Malaysia highly susceptible to world market volatilities and instabilities. This has been proven time and time again when the country has to weather crises such as the financial crisis in 1997 and high crude oil and food prices in mid 2008. It was during the financial crisis in 1997 that the country saw the strategic need to develop local food production to minimise outflows of foreign exchange on food. In 2002, the government initiated a balance of food trade plan (BFTP) to achieve a food trade surplus of USD0.34 billion[a] in 2010 despite the apparent lack of comparative advantage of the sector (Malaysia, 2005). A detailed action plan was developed to steer the food sector towards both export growth and import substitution to turn the deficit gap to a surplus figure. As 2010 is approaching, the country's food deficit gap did not show any trend of narrowing, in fact it is growing wider. This paper examines the rate of achievement of the plan in order to evaluate the policy premises and assumptions and hence some indications as to the factors that lead to its off-mark target.

2. Literature Review

In the last few decades, Malaysia obtained surpluses for live animals, birds' eggs, fish, crustaceans, molluscs and aquatic invertebrates, and preparations, coffee, tea, cocoa, spices, and manufactures and miscellaneous edible products and preparations. Malaysia depends on imports for dairy products (particularly milk), cereals (mainly rice and corn for feedstuff), vegetables, fruits, sugar, food and beverages and processed food products. Under the FBTP, the government has identified a total of 1,802 commodities (at 9 digit level of SITC Revision 3 classification) that have potential for both export growth and import substitution. The balance of food trade plan (collapsed into 2 digit level of SITC Rev. 3 classification) is presented in Table 1. Based on the past performance of the sector, targets were set for exports, imports and hence balance of trade of each of the selected commodities that were assumed to have the potential for growth by 2010. Two projections were made, one is based on the assumption that there were no major interventions made by the government and the other based on major interventions. The latter became the targets for the BFTP. Under the plan, a number of strategic projects were implemented such as Permanent Food Production Parks, Aquaculture Industrial Zones, Beef Valley, promotion of contract farming and entrepreunerial development programmes (Malaysia, 2006b).

Table 1 Malaysia: Balance of Food Trade Plan (USD mn)

SITC	Commodity	Sector	BFTP (2010) (USD mn)			Expected Outcome of BoT[a]
			2000	2010	2010	
			Actual	Without intervention	With intervention	
00	Live animals	Export	105.0	137.4	137.4	Surplus widens
		Import	45.6	48.2	48.2	
		BoT	59.4	89.1	89.1	
01	Meat and meat preparations	Export	19.1	100.0	951.5	Deficit to surplus
		Import	226.8	283.8	655.0	
		BoT	-207.6	-183.8	296.5	
02	Dairy products	Export	66.8	87.4	87.4	Deficit widens
		Import	343.5	447.1	447.1	
		BoT	-276.8	-359.7	-359.7	
02	Birds eggs	Export	53.8	65.6	65.6	Surplus widens
		Import	2.6	3.8	3.8	
		BoT	51.2	61.8	61.8	
03	Fish, crustaceans, molluscs and aquatic invertebrates, and preparations thereof	Export	371.5	312.6	1,360.3	Surplus widens
		Import	319.4	588.2	247.4	
		BoT	52.4	-275.6	1,112.9	
04	Cereals and cereals preparations	Export	179.7	217.6	294.1	Deficit narrows
		Import	540.9	708.8	588.2	
		BoT	-361.2	-491.2	-294.1	
05	Vegetables	Export	81.8	88.2	221.2	Deficit narrows
		Import	301.2	589.7	233.2	
		BoT	-219.1	-501.5	-12.1	
05	Fruits	Export	150.6	165.0	605.6	Deficit to surplus
		Import	165.3	399.7	237.6	
		BoT	-14.4	-234.7	367.9	
06	Sugars, sugar preparations and honey	Export	104.1	147.1	205.9	Deficit narrows
		Import	319.1	382.4	382.4	
		BoT	-215.0	-235.3	-176.5	
07	Coffee, tea, cocoa, spices, and manufactures thereof	Export	339.4	352.9	529.4	Surplus narrows
		Import	239.4	535.3	470.6	
		BoT	100.0	-182.4	58.8	
08	Feeding stuff for animals (not including unmilled cereals)	Export	110.3	143.2	156.2	Deficit widens
		Import	567.1	840.3	1,265.6	
		BoT	-456.8	-697.1	-1,109.4	
09	Miscellaneous edible products and preparations	Export	306.5	453.8	726.8	Surplus widens
		Import	269.7	678.5	254.4	
		BoT	36.8	-224.7	472.4	
Total		Export	1,888.8	2,270.9	5,341.2	Deficit to surplus
		Import	3,340.3	5,505.9	4,833.5	
		BoT	-1,451.5	-3,235.0	507.6	

Note: a - BoT is Balance of Trade
Source: Malaysia (2005).

The plan purported that by 2010, Malaysia shall achieve an aggregate surplus of USD0.34 billion. The underlying assumptions of the plan were; firstly, the export was expected to grow more than import, i.e., between 2000-2010 it was expected to grow at 10.9% per year compared to only 3.76% of import. Secondly, the major source of export growth came from all sectors with the exception of dairy products, cereals, vegetables, and sugar, i.e., commodities that did not indicate clear comparative advantage. Thirdly, the projects implemented would be able to increase food production and hence export growth. Based on these assumptions, the expected outcome on the balance of trade can be classified into five categories (Table 2). They are: deficit to surplus, deficit widens, surplus widens, deficit narrows and surplus narrows.

Table 2 Expected Outcome of Malaysia's Food Balance of Trade Plan

Expected Outcome	Commodity	No.
Deficit to surplus	Meat and meat preparations	2
	Fruits	
Deficit widens	Dairy products	2
	Feeding stuff for animals (not including unmilled cereals)	
Surplus widens	Birds eggs	4
	Fish, crustaceans, molluscs and aquatic invertebrates, and preparations thereof	
	Miscellaneous edible products and preparations	
	Live animals	
Deficit narrows	Cereals and cereals preparations	3
	Vegetables	
	Sugars, sugar preparations and honey	
Surplus narrows	Coffee, tea, cocoa, spices, and manufactures thereof	1
Deficit to surplus	All	12

In the Total Quality Management framework there are generally six general categories of performance measures: Productivity is the ratio of output to input; Efficiency refers to the degree to which output is produced relative to minimum cost; Effectiveness indicates the degree to which output conforms to requirements; Quality indicates the degree to which output meets customer requirements; Timeliness determines whether the output is produced correctly and on time; and lastly, Safety refers to the overall health of the organization and working environment of employees (U.S. Dept. of Energy, 1995). While the use of performance measures in business and public sector is not new, however, performance measurement in the public sector is more difficult (Dilulio Jr., 1993, Schacter, 2002a). Public sector programs are mainly instituted to achieve societal goals which can be ambiguous in nature. Unlike the bottom line for private firms (revenues, profits, share prices, etc.), their equivalent for public enterprises are not that clear. Schacter (2002b) outlines four main challenges to measuring public sector outcomes: multiple high-level outcomes; measurability; long time lag; and attribution.

Although the input (resources used) and output (activities completed or intermediate outcomes) variables of both private and public agencies can be measured, the (final) goals or outcomes of public programs can be

ambiguous and difficult to measure. Furthermore, while both input and output variables refer to items within the agency the outcome variables are outside the agency (Schacter, 1993).

The distinction is also made in the literature between performance and evaluation. Performance refers to a description of the present "here and now" while evaluation has a longer term perspective. Performance indicators merely state the present situation. Although performance measurement may indicate whether the firm is on the right track towards achieving the goals, an evaluation usually provide more than just static descriptions and usually include an analysis as to the factors creating the present situation and may examine alternative ways of achieving the same objectives in light of the analysis.

3. Methodology

This paper performs a simple performance measurement of the BOT Plan of the Ministry of Agriculture and Agrobased Industries Malaysia. The overall objective is to determine whether or not the targets (set in 2000) will be met in 2010. The measurement must take into account that the BOTP does not show continuous series of data but rather just three data points for the interval 2000 – 2010. It shows the values of exports, imports, and the BOT for 2000 (the initial value) and the projected values for 2010 without and with (the target value) intervention.

Note that using the basic compound growth formula $Y_t = Y_0(1+r)^t$ the implied rate of growth can be measured as:

$$(1)\ r = \left(\frac{Y_t}{Y_0}\right)^{\left(\frac{1}{t}\right)} - 1$$

A complication arises when either Y_t or Y_0 is negative as may happen in the case of BOT. Note that when both Y_0 and Y_t are negative, as the case for five of the commodities, the rate of growth can be computed without difficulty. However, as in two of the commodities examined (and the overall), the BOT is expected to change from an initial negative situation to a positive target. In this case the negative initial value is transformed to its absolute value ($Y_0^* = |Y_0|$), and the target value is transformed by adding to it the sum of the target value and the absolute value of the initial value ($Y_t^* = Y_t + (Y_t + |Y_0|)$). In other words the algebraic difference between Y_0 and Y_t is the same as that between Y_0^* and Y_t^*. With both Y_0^* and Y_t^* positive, the rate of growth is estimated using (1). Note, however, this estimated rate of growth of the transformed values is an underestimation of the actual rate of growth of the original values.

Using the actual series for 2000-2006 obtained from the Department of Statistics Malaysia we computed the actual rates of growth, and projected the values for 2010. These are the likely values to be "achieved" in 2010.

From these values we define the target gap as the difference between the target and initial values (i.e. T-I) and the achieved gap as the difference between the achieved and the initial (i.e. A-I). The achievement rate is then defined as the ratio of the achieved gap to the target gap:

$$(2)\quad AR = \left(\frac{A-I}{T-I}\right)$$

Note that the ratio A/T merely indicates how close the actual is to the target value. This is not a measure of performance especially when comparing across commodities or time. The true performance must depend on the starting point for each commodity or period in question. For example at the point of measurement commodities A and B might both achieve 75% of their respective target values but if A had started from a value 50% from the target while B had started from 60%, the performance of A is deemed better than that of B as A had narrowed the gap more between the initial exercise and the measurement point. Using equation 2, commodity A's achievement is 25/50=50% while that of B is 15/40=37.5%. The interpretation of (2) is straightforward in the case of exports or BOT when the target is greater than the initial value, i.e. denominator is positive. If A>T then AR>1, this is the case of overachievement. If A is not only less than T but even less than I, the numerator is negative, this is the case of negative achievement, the situation is made worse.

For the case of imports, sometimes the target is also greater than the initial value. This is true for eight of the 12 commodities examined in this paper. In this case the government is not promoting an increase in import but rather, recognizing the fact that import has to increase due to rising income or population, it is targeting the rise to not more than the stipulated amount. As an illustration, suppose the import is 55 in the initial period and, after government programs have been instituted, is expected to be 75 at the end of the period. We can say that the policy is to limit the increase to 20. If actual import has increased to 70, we can say that this is a positive achievement as we had planned the rise to 20 but has managed to contain it to just 15. In other words we have prevented (or saved) 5 units of imports, which is equivalent to 5/20=25%. To reflect this interpretation (2) is rewritten as:

$$(2a)\quad AR = 1 - \left(\frac{A-I}{T-I}\right)$$

The interpretation of (2a) is also straightforward. If I<A<T, this is the case of positive achievement, as in the above example. If I<T<A, this is the case of negative achievement, the government fails to limit the rise in imports to T. If A<I<T, this is the case of overachievement, the government is even able to reduce the level of import during the policy period.

4. Results and Discussion

The results on the rate and type of achievement of the BFTP are presented in Tables 3 - 5. The achievement rates are evaluated separately according to sectors - exports, imports and balance of trade. In the case of exports (Table 3), the achievement has been impressive. Out of the 12 commodities, only fruits indicate negative achievement (-5.4%). The rest of the commodities indicate positive achievement with five commodities expected to meet the targets. They are dairy products (615.8%), coffee, tea, cocoa, spices, and manufactures (399.9%), feeding stuff for animal (296.1%), miscellaneous edible products and preparations (145.5%) and vegetables (89.2%). The overall performance of export is considered positive achievement.

The findings for the import sector, however, indicated otherwise (Table 4). Only one commodity is expected to meet its target, i.e., feeding stuff for animal (with achievement rate of 100.5%). Under the BTFP, it was estimated that import would reach USD1.3 billion. However, based on the annual rate of growth between 2000-6, the estimated actual import figure of import for this item in 2010 will be USD564 million, much lower than targeted as well as lower than the initial base year figure of USD567 million (or negative achievement of -168.9%). Two commodities indicated positive achievement, i.e., meat and meat preparations (70.8%) and birds' eggs (57%). The rest of the commodities indicated negative achievement which contributed to the high level of overall deficit in 2010. These data suggest that the plan has underestimated the rate of growth of import which was estimated to grow at 10.2% per year (between 2000-10) compared to targeted rate at 3.8% per year in the plan (Table 6). The overall poor performance of the import sector dictated the nature of the balance of food trade, where deficit was imminent. As shown in Table 5, only one commodity will meet the BFTP, that is feeding stuff for animals (with achievement rate of 121.3%). Three commodities show positive achievement, birds' eggs (85%), miscellaneous edible products and preparations (36.4%) and fish, crustaceans, molluscs and aquatic invertebrates, and preparation (6.8%). The rest of the commodities failed miserably. Based on the annual rate of growth 2000-06, the expected balance of trade in 2010 will reach USD2.9 billion as against the surplus target of USD508 million and the initial value of USD1.5 billion in 2000 (a negative achievement of -72.7%).

Despite the FBTP, the food deficits persist. This is not surprising as not only was import value higher in terms of quantity and value, its annual rate of growth compared to export was higher (Table 6 and Figure 1). As shown in Table 5, only three commodities have the potential to reach the targets. They are birds' eggs (the target will be reached in 2011), fish, crustaceans, molluscs and aquatic invertebrates, and preparation (2025) and miscellaneous edible products and preparations (2015). With the exception of feeding stuffs for the animals, the rest of the commodities may not be able to achieve the target in the near future.

Table 3 The Achievement Rate of the Malaysian Food Balance of Trade Plan: Export Sector

Commodity	USD million				Achievement Rate (%)	Nature of Achievement
	Initial Value (I)	Target (T)	Expected Value (E)	Gap between Target and Expected Value		
	2000	2010	2010			
Live animals	105.0	137.4	126.6	-10.7	66.9	Positive achievement
Meat and meat preparations	19.1	951.5	37.5	-913.9	2.0	Positive achievement
Dairy products	66.8	87.4	193.5	106.2	615.8	Achievement above target
Birds eggs	53.8	65.6	63.3	-2.3	80.8	Positive achievement
Fish, crustaceans, molluscs and aquatic invertebrates, and preparations	371.5	1,360.3	943.4	-416.9	57.8	Positive achievement
Cereals and cereals preparations	179.7	294.1	347.0	52.9	146.2	Achievement above target
Vegetables	81.8	221.2	206.1	-15.1	89.2	Positive achievement
Fruits	150.6	605.6	126.1	-479.5	-5.4	Negative achievement
Sugars, sugar preparations and honey	104.1	205.9	174.0	-31.9	68.7	Positive achievement
Coffee, tea, cocoa, spices, and manufactures thereof	339.4	529.4	1,099.2	569.8	399.9	Achievement above target
Feeding stuff for animals (not including unmilled cereals)	110.3	156.2	246.2	90.0	296.1	Achievement above target
Miscellaneous edible products and preparations	306.5	726.8	918.0	191.2	145.5	Achievement above target
Total	1,888.8	5,341.2	4,481.1	-860.1	75.1	Positive achievement

Table 4 The Achievement Rate of the Malaysian Food Balance of Trade Plan: Import Sector

Commodity	USD million				Rate of Achievement (%)	Type of Achievement
	Initial Value (I)	Target (T)	Expected Value (E)	Gap between Target and Expected Value		
	2000	2010	2010			
Live animals	45.6	48.2	68.8	20.6	-777.0	Negative achievement
Meat and meat preparations	226.8	655.0	351.6	-303.4	70.8	Positive achievement
Dairy products	343.5	447.1	600.9	153.9	-148.6	Negative achievement
Birds eggs	2.6	3.8	3.2	-0.7	57.0	Positive achievement
Fish, crustaceans, molluscs and aquatic invertebrates, and preparations	319.4	247.4	819.4	572.1	-693.9	Negative achievement
Cereals and cereals preparations	540.9	588.2	1,383.0	794.8	-1678.4	Negative achievement
Vegetables	301.2	233.2	665.3	432.1	-536.0	Negative achievement
Fruits	165.3	237.6	250.3	12.6	-17.4	Negative achievement
Sugars, sugar preparations and honey	319.1	382.4	519.2	136.9	-216.4	Negative achievement
Coffee, tea, cocoa, spices, and manufactures thereof	239.4	470.6	1,407.9	937.3	-405.4	Negative achievement
Feeding stuff for animals (not including unmilled cereals)	567.1	1,265.6	563.7	-701.9	100.5	Achievement above target
Miscellaneous edible products and preparations	269.7	254.4	722.7	468.3	-2961.9	Negative achievement
Total	3,340.3	4,833.5	7,356.0	2,522.5	-168.9	Negative achievement

Table 5 The Achievement Rate of the Malaysian Food Balance of Trade Plan: Import Sector

Commodity	USD million								
	Initial Value (I)	Target (T)	Expected Value (E)	Gap between Target and Expected Value	Rate of Achievement (%)	Type of Achievement	Future prospect	Year Target Will be Achieved	RoG[a] required to achieve target in 2020
	2000	2010	2010						
Live animals	59.4	89.1	57.8	-31.3	-5.3	Negative achievement	Not achievable	na	na
Meat and meat preparations	-207.6	296.5	-314.1	-610.6	-21.1	Negative achievement	Not achievable	na	na
Dairy products	-276.8	-359.7	-407.4	-47.7	-57.5	Negative achievement	Not achievable	na	na
Birds eggs	51.2	61.8	60.2	-1.6	85.0	Positive achievement	Possible	2011	na
Fish, crustaceans, molluscs and aquatic invertebrates, and preparations	52.4	1,112.9	124.0	-988.9	6.8	Positive achievement	Possible	2025	0.25
Cereals and cereals preparations	-361.2	-294.1	-1,036.0	-741.9	-1006.3	Negative achievement	Not achievable	na	na
Vegetables	-219.1	-12.1	-459.3	-447.2	-116.0	Negative achievement	Not achievable	na	na
Fruits	-14.4	367.9	-124.1	-492.1	-28.7	Negative achievement	Not achievable	na	na
Sugars, sugar preparations and honey	-215.0	-176.5	-345.2	-168.8	-338.0	Negative achievement	Not achievable	na	na
Coffee, tea, cocoa, spices, and manufactures thereof	100.0	58.8	-308.6	-367.5	-892.4	Negative achievement	Not achievable	na	na
Feeding stuff for animals (not including unmilled cereals)	-456.8	-1,109.4	-317.5	791.9	121.3	Achievement above target	Target met	na	na
Miscellaneous edible products and preparations	36.8	472.4	195.3	-277.1	36.4	Positive achievement	Possible	2015	na
Total	-1,451.5	507.6	-2,874.9	-3,382.6	-72.7	Negative achievement	Not achievable	na	na

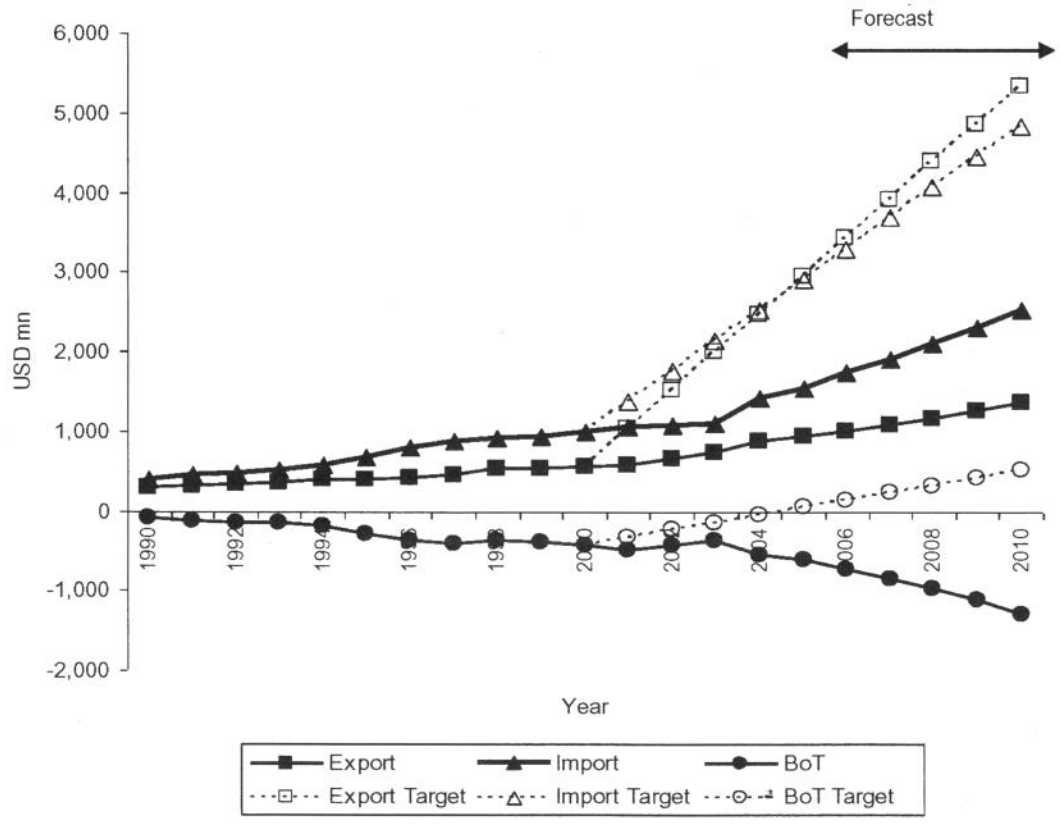
Note: a - RoG is rate of growth

Table 6 Annual Rates of Growth of Malaysia's Food Export and Import (%)

Commodities	Export		Import	
	Annual RoG[a] 2000-6	Implied RoG 2000-10	Annual RoG 2000-6	Implied RoG 2000-10
Live animals	1.59	2.72	1.92	0.57
Meat and meat preparations	4.52	47.81	4.81	11.19
Dairy products	15.24	2.72	6.38	2.72
Birds eggs	3.52	2.00	-0.24	2.00
Fish, crustaceans, molluscs and aquatic invertebrates, and preparations	12.49	13.86	12.15	-2.52
Cereals and cereals preparations	8.94	5.05	7.50	0.84
Vegetables	11.48	10.46	10.03	-2.52
Fruits	-1.89	14.93	4.68	3.70
Sugars, sugar preparations and honey	5.10	7.06	5.57	1.82
Coffee, tea, cocoa, spices, and manufactures thereof	17.15	4.55	28.44	6.99
Feeding stuff for animals (not including unmilled cereals)	9.51	3.54	8.83	8.36
Miscellaneous edible products and preparations	14.84	9.02	11.96	-0.58
All	11.30	10.95	10.21	3.76

Note: a – Rate of growth

Figure 1 Malaysia: Export, Import and Balance of Trade of Food and Food Balance of Trade Plan



5. Conclusions

The above analysis attempts to measure the rate of achievement of the FBTP of Malaysia. Unlike the normal method of measuring achievement where it is measured as simply the percentage of actual achievement against the target, the paper proposed that it should be measured as the ratio of the difference between initial and the estimated actual AND the difference between the targets and the initial value. These achievement rates reflect the actual success or failure of the plan. Based on this methodology, the findings suggest that the Malaysian food balance of trade plan is not achievable, at least in the medium term, due to the overly ambitious targets set for both export and import sectors and hence the resultant overall deficit. The decision to promote growth in food industry was commendable, but to assume high rates of growth that are not supported with equally large investments and incentive packages from the government, may prove to be futile. Besides, the fundamentals of the industry in particular the factor that are affecting the demand and supply sectors were not given due consideration. The demand for food import was driven by the increase in income, change in lifestyle and dietary habit which explain the continuous increase in demand of high quality and processed food products such as meat, dairy products, fruits, vegetables, food and beverages. On the other hand, the supply sector has not grown as fast as expected due to production problems, limited support from the government and threat of cheaper imports (Fatimah *et al.*, 2007 and 2008). Besides, to have one policy to fit all belies the differences between sectors in terms of production structures, comparative advantage which require specific treatment and strategies. The failure to meet the target does not mean that there is no potential for food sector growth; in fact the reverse is true. That is, as shown by the analysis on the export sector, most of the commodities registered positive growth. Hence, the policy towards promoting growth of the food sectors that exhibit comparative advantage is an achievable option rather than focussing on changing the balance of trade figure, which is merely a consequence of export and import and does not represent the real industries.

End Notes

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a – There was a discrepancy between the surplus figure reported in the Malaysian Ninth Plan (Malaysia, 2006) and the actual figure derived from the plan calculated by the researchers.

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