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Shazali Abu Mansor and Bakri Abdul Karim

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SUBSIDY AND EXPORT: MALAYSIAN CASE

Shazali Abu Mansor and Bakri Abdul Karim

Faculty of Economics and Business
Universiti Malaysia Sarawak (UNIMAS),
94300 Kota Samarahan, Sarawak, Malaysia

ABSTRACT

This paper examines the long-run relationship between subsidies and export for the case of Malaysia using annual data from 1976 to 2010 and cointegration test. The results show that the subsidies significantly influence export in the long-run. This support the argument by the non-neo-classical economists' propagation that export promotion requires a pro-active government role in the economy. This study has shed some lights that subsidy may not be detrimental to an economy.

Key words: Subsidies; Export; Cointegration

1. INTRODUCTION

The posit that subsidy leads to inefficiency was never an ending debate despite the emergence of the strategic trade policy argument under new trade theory. Subsidies can be seen as government support to industry which leads to country obtaining competitive advantage. The advocates of providing subsidies or government support often base their case on the ground of externality and infant industry argument. The argument for subsidies in case of infant industry and externality are closely related. Support for infant industry is due to the existence of externality such as knowledge and labor training which can lead to economic spillover effects (Stewart and Ghani, 1991).

Collie (1991) argues that if the domestic countries pursue an optimal trade policy, then it will always benefit from a subsidy. Subsidies might be attractive policies from a domestic point of view. Spencer and Brander (1983) argue that the national governments use subsidies to help domestic firms expand their market shares in profitable areas and the governments can grant strategic advantages on domestic companies. In addition, the subsidy actually increases domestic

welfare net for the subsidizing country (Brander and Spencer, 1985; Alston et al. 1993). In contrast, Parish and McLaren (1982) argue that the raising of funds to disburse subsidies itself gives rise to burden losses in another place in the economy. However, Meza (1986) shows that the government intervention including subsidies in Japan is able to promote progressive industries and led to their economic success. In the context of Malaysia, Mansor and Alias (2004) show that with government support via subsidy, the fertilizer firm was able to increase their export.

Most literature on strategic trade policy concerning the ability of the firm in the developed country to export under the notion of rent snatching argument. Under the framework of imperfect competition, abnormal profit is present in the industry of the developed countries. Thus through government support, the economic profits can be shifted from the foreign companies to the domestic companies. However, this policy will invite foreign retaliation as this is an example of *beggar – thy – neighbor* policy. Thus, this study does not attempt to analyze the ability of subsidy is snatching the profits; instead it attempts to show the importance of subsidy in promoting export. Since the global market is huge, there should not be any question of snatching other countries export share which would not lead to the *pareto* optimal situation.

In the context of Malaysia, there are relatively few studies investigating the roles of subsidies in economy. Previous studies have focused on the relationship between subsidies and production in agricultural and fisheries sectors (see Yahaya, 1976; Noor and Hussein, 1986; Wells, 1981). Our study contributes further to the literature by examining the relationship between subsidies and export with has not been documented previously. The rest of this paper is structured as follows. Section 2 gives some overview of Malaysian subsidies and export while Section 3 provides the methodology and description of the data. The fourth section provides the

empirical results and discussion. Finally, the fifth section concludes the study and providing some implications

2. AN OVERVIEW OF MALAYSIAN EXPORT AND SUBSIDIES

Malaysia has an open economy. Its exports and imports constitute a very high proportion of the Gross National Product (GNP). The ratio of trade/GNP is much higher than in many other developed countries such as the USA and the United Kingdom, which are also notable for their openness. For example, in 2010 the ratio of trade/ GNP was at 1.60. A high and continuing increase in the ratio of exports and imports to GNP suggests the increasing importance of the external sector in the Malaysian economy. On average, the export sector grew at 13 per cent per annum between 1976 and 2010. The total value of exports from Malaysia was recorded at RM638.82 billion in 2010. This figure is impressive, considering that Malaysia is a small developing country, where the population is less than 0.5 per cent of the world's population. The thrust of the development policy is to manufacture for export since its independence. Statistical evidence points to a high degree of success, as Malaysia has increased its share in world exports. Malaysia contributed about 0.57 per cent of world export in 1970. Its share had doubled by 2010 to 1.32 per cent. The same growth in the share of export is also evident in the proportion of exports from the developing countries, where Malaysia increased its share from 2.4 per cent in 1970 to 3.40 per cent in 2010.

Table 1: Malaysian Subsidies and Export (RM million)

| | SUBSIDIES* | Growth (%) | EXPORT | Growth (%) |
|-----------------------|-------------------|-------------------|---------------|-------------------|
| 1980 | 627 | - | 28,172 | - |
| 1985 | 266 | -57.64 | 38,017 | 34.94 |
| 1990 | 434 | 63.57 | 79,646 | 109.50 |
| 1995 | 539 | 23.88 | 184,986 | 132.25 |
| 2000 | 4,245 | 688.23 | 373,270 | 101.78 |
| 2005 | 11,781 | 177.51 | 536,234 | 43.65 |
| 2010 | 20,333 | 72.60 | 638,822 | 19.13 |
| Average annual growth | 28.60% | | 11.54% | |

Notes: *excluding food subsidies

Source: Bank Negara Malaysia (Statistical Monthly Bulletin)

The Malaysian government provides subsidies indiscriminately to several sectors in the economy such as cooking oil, flour, bread, sugar, petrol etc with the objective to control price level. In 2009, 22% of government expenditures were subsidies with 12% allocated for petrol subsidies (Business Times, 2009). Industrial sector also benefited from natural gas subsidies with accounted for 10% to 15% per annum (Leoi, 2008). As shown in Table 1, the subsidies recorded higher average growth rate at 28.60% than export at 11.54% during the period from 1980 to 2010.

3. METHODOLOGY AND DATA

In this paper, we employ time-series techniques of cointegration and Granger causality test to examine the long-run relationship among the variables of interest. Since this method is widely used, we mention only those aspects that are appropriate in this study. For proper model specification, we conduct the commonly used unit root tests, Augmented Dickey-Fuller (ADF) and Phillips-Perron (PP) to determine the variables' orders of integration. Then, to test for

cointegration, we employ a vector autoregressive (VAR) based approach of Johansen (1988) and Johansen and Juselius (1990), henceforth the JJ cointegration test. Since the results of the JJ cointegration test tend to be sensitive to the order of VAR, following Hall (1989) and Johansen (1992), we specify the lag length that renders the error terms serially uncorrelated. In addition, we also employ vector autoregression (VAR) of variance decomposition to examine the strength of shocks in the subsidy in explaining the changes in the export.

Since focusing on these two variables in bivariate framework may not be satisfactory to test their relationship. Therefore, we also include real exchange rate (EX) as a control variable while running a cointegration test. All data are collected from the Statistical Bulletin published by Bank Negara. All variables are expressed in natural logarithm.

Table 2 presents the descriptive statistics of the data (in terms of annual percentage change), including sample mean, maximum, minimum, standard deviations, skewness and kurtosis. All variables recorded positive average annual growth rate. The subsidies recorded the highest average annual growth of 19.18 percent, followed by export (11.36 percent) and real exchange rate (0.79 percent). All annual growth, returns, have excess kurtosis (greater than 3), which means that they have a thicker tail and a higher peak than a normal distribution.

Table 2: Descriptive Statistics of the Variables (Annual Growth)

| Variables | Δ SUB | Δ EXP | Δ EX |
|-----------|--------------|--------------|-------------|
| Mean | 0.1918 | 0.1136 | 0.0079 |
| Maximum | 1.4635 | 0.3497 | 0.4385 |
| Minimum | -0.8376 | -0.1823 | -0.1378 |
| Std. Dev. | 0.5371 | 0.1071 | 0.0894 |
| Skewness | 0.6714 | -0.6666 | 3.1823 |
| Kurtosis | 3.2947 | 3.8691 | 17.2127 |

4. EMPIRICAL FINDINGS

Prior to use the cointegration test, we have to decide the degree of integration of the variables. Both the standard Augmented Dickey-Fuller (ADF) and Phillips-Perron (PP) unit root tests are performed to determine the order of integration for the variables. Table 3 suggests that all variables are integrated of order one, $I(1)$ and, then, we proceed to the JJ cointegration test.

Table 3: Unit Root Tests

| Variable | Level | | First-Difference | |
|----------|---------|---------|------------------|-----------|
| | ADF | PP | ADF | PP |
| SUB | -2.1444 | -2.2795 | -3.7228** | -4.0021** |
| EXP | -1.0433 | -1.1589 | -5.0593** | -5.1136** |
| EX | -2.1706 | -2.2366 | -5.8250** | -5.8411** |

The result of JJ cointegration test is reported in Table 4. The trace and maximal eigenvalue statistics suggest the presence of a unique cointegrating vector among the three variables. Thus, there exists a long run relationship between subsidies and export.

Table 4: Cointegration Tests

| Null hypothesis | Test statistics | | 5 % Critical Value | |
|-----------------|-----------------|--------|--------------------|-------|
| | Trace | Max | Trace | Max |
| $H_0: r = 0$ | 31.14** | 20.04* | 29.80 | 21.13 |
| $H_0: r \leq 1$ | 11.11 | 9.74 | 15.50 | 14.26 |
| $H_0: r \leq 2$ | 1.36 | 1.36 | 3.84 | 3.84 |

Estimated long-run parameters (normalized on EXP):

$$EXP = 3.03 + 0.95SUB + 1.93EX$$

(5.62)** (1.80)

Note: ** and * significant at 5% and 10% respectively. Figures in parentheses are t -value.

The estimated long-run parameters, which are readily available from the JJ procedure, suggest that both subsidies and real exchange rate have a positive relation with export. From the estimated equation, we find that for 1% increase in subsidies will lead to 0.95% increase in

export. In addition, we have also calibrated in terms of value, the effect of subsidies on export (refer to Table 5). For the period from 1980 to 2010, on average, for every ringgit spent on subsidies we will able to generate RM105.04 foreign exchange with contribute positively to the Malaysian current account and balance of payment.

Table 5: Calibrated Export-Subsidies Value

| Year | Marginal Export Value | Marginal Export Profit* |
|----------------|------------------------------|--------------------------------|
| 1980 | 37.54 | 7.51 |
| 1985 | 119.59 | 23.92 |
| 1990 | 153.17 | 30.63 |
| 1995 | 287.15 | 57.43 |
| 2000 | 73.50 | 14.70 |
| 2005 | 38.05 | 7.61 |
| 2010 | 26.26 | 5.25 |
| Average | 105.04 | 21.01 |

Note: * With the assumption of 20% profit.

Table 6: Granger Causality Tests

| Dependent Variables | Independent Variables (chi-sq) | | | ECT |
|----------------------------|---------------------------------------|----------------|----------------|---------------------|
| | EXP | SUB | ER | |
| EXP | - | 3.90 (0.14) | 1.10 (0.57) | -0.18*** [-3.51] |
| SUB | 0.32 (0.85) | - | 1.79 (0.41) | -0.19 [-1.28] |
| ER | 1.80 (0.41) | 1.50 (0.47) | - | -0.05 [-1.86] |

Note: *** significant at 1%. Figures in parentheses and square brackets are p-value and t-value respectively .

In order to determine the causal nexus among the examined variables, we implement the Granger causality test. With cointegration, the dynamic causal interactions among the variables should be expressed in a vector error correction form. This allows us to assess both the short-run causality (χ^2 – test of the lagged first-differenced terms) and long-run causality (t-test of the error correction terms). The results of the tests are presented in Table 6. The results indicate no short-run causality found among the variable of interest. However, there exists a long-run causality from SUB and ER to EXP. The estimated coefficient for the error correction terms is -0.18, suggesting that the last period disequilibrium is corrected by 18 percent on the following year.

We further investigate the relative strength of shocks in the subsidy and real exchange rate in explaining the changes in the Malaysian export. Thus, we adopt the VAR model of variance decomposition (VDC). The orderings that we have chosen to generate variance decompositions are: export, real exchange rate and subsidy. Table 7 shows the VDCs for up to 10 years period. From the results, we conclude that the export's forecast error variance is accounted for its own innovations and the innovations in the subsidy lead to fluctuations in the Malaysian export significantly.

The results from cointegration and VDC are consistent with those of Spencer and Brander (1983), Brander and Spencer (1985) Meza (1986), Collie (1991) and Alston et al. (1993) that indicate the significance of subsidies in inducing export.

Table 7: Variance Decomposition

| Periods | EX | SUB | EXP |
|--------------------------------|-----------|------------|------------|
| Variance Decomposition of EXP | | | |
| 1 | 1.16 | 7.56 | 91.27 |
| 4 | 1.49 | 18.76 | 79.74 |
| 8 | 0.89 | 30.86 | 68.23 |
| 10 | 0.70 | 33.00 | 66.28 |
| Variance Decomposition of EX | | | |
| 1 | 97.06 | 2.93 | 0.00 |
| 4 | 90.58 | 8.19 | 1.21 |
| 8 | 72.31 | 20.67 | 7.01 |
| 10 | 67.51 | 22.97 | 9.51 |
| Variance Decomposition of LSUB | | | |
| 1 | 0.00 | 100.00 | 0.00 |
| 4 | 1.28 | 98.45 | 0.26 |
| 8 | 2.49 | 94.36 | 3.14 |
| 10 | 2.60 | 91.91 | 5.47 |

5. CONCLUSION

In this paper we examine the long-run relationship between subsidies and export using annual data from 1976 to 2010 and cointegration test. We found evidence of a long-run relationship among the variables of interest. The results indicate that subsidies positively influence the export. Thus, the subsidies can lead to increasing export in Malaysia. This support the argument by the non-neo-classical economists' propagation that exports promotion requires a pro-active government role in the economy. Malaysian success story of the developing country, having emerged from commodity export nation to industrial exporting country indirectly as a result of prudent export and industrial policy which include providing the economy with subsidy. Although the subsidy is not being targeted to specific industry, the evidence suggests the strong relationship between subsidy and export. The growth of the export can be translated to the economic growth of the country. Nevertheless, other factors that contribute to increasing in

export such as research and development, infrastructure and other fiscal incentives are important which is beyond the scope of this study. This study has shed some lights that subsidy may not be detrimental to an economy.

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