Two-Gap Model of Development: Relevance and Applicability to Rural Development in Sri Lanka

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INTRODUCTION

Sri Lanka, with a population of over 20 million is endowed with human and natural resources. Agriculture remains the dominant sector of the economy, despite the relative decrease of its share of output as a percentage of GDP. Macroeconomic data gathered by the Central Bank of Sri Lanka suggest that significant improvements in the macroeconomic variables related to internal balance have been achieved by the country in the recent past. Economic growth in last fifteen years, for example, has averaged out at 5.7% with the highest growth rate of 8.2% recorded in 2011. Unemployment rate has continually declined, reaching 4% in 2012 from 8.8% in 2002. Per capita income GNP at market prices in US$ terms has remarkably increased to $2,866 in 2012 from $ 881 in 2000. In the government fiscal operation, budget deficit averaged 7.8% in the period 2000 - 2012. However, variables relating to external balance in the country during the study period indicate a crisis situation. For example, Sri Lanka faced its worst balance of payments (BOP) crisis in terms of current account deficit over the period, 2002-2012. Sri Lanka's share of world exports has declined from 0.08% in 2008 to 0.05% in 2010 and the ratio remained stable for the next five years. The outstanding foreign debt ratio was nearly 50% of GDP for the decade, means that Sri Lanka's economy largely depends on foreign assistants. The situation is a result of two problems: a savings-gap (or savings constraints) internally and a trade gap (or foreign exchange constraints) externally. With this context, the two-gap model of

development will be used to explain the current situation of the Sri Lankan economy from a policy making point of view.

Research Problem

Export diversification has gained more attention by policy makers in successive governments of independent Sri Lanka by means of solving the foreign exchange constraints. However, export diversification in the agricultural sector has lagged behind expectations. This was mainly due to the lack of knowledge and information among potential investors about theory, policy and opportunities to invest in the agricultural sector. This study attempts to fill the gap.

Objective of the Study

The objective of this study is twofold:

(i) To examine whether or not the theoretical prescription that the two-gap model of economic growth purports to hold in Sri Lanka and

(ii) If not, how the Sri Lankan economy may be guided towards the correct path using policies suggested by the two-gap model of development.

METHODOLOGY

The two-gap model is based on the gap between the country's own provision of resources and its absorptive capacity. Post Keynesian growth models have identified two major constraints: lack of savings and foreign exchange in the effort to develop the developing countries like Sri Lanka. An incidence of inadequate domestic savings or inappropriate mobilisation of savings for financing planned investment is termed a savings constraint (savings-gap). This gap can be corrected by encouraging foreign direct investment otherwise known as foreign capital inflow. On the other hand foreign

exchange constraints or trade-gaps exist where export earnings fall short of the amount needed to purchase necessary intermediate imports and capital imports. This problem can correct using external assistance such as foreign debt and grants.

The derivation of the two-gap model can start with the basic macroeconomic identity where aggregate output = aggregate expenditure. Thus, assuming there is no government sector:

$$Y = C + I + (X - M) \text{----------} [01]$$

Where, Y = GNP; C = Consumption; I = Investment of Gross domestic capital formation; X = Exports and M = Imports

The variables in equation [01] can be divided into two as:

Source of resources in the economy = Use of resources in the economy

$$Y + M = C + I + X$$

Subtracting C from both sides we get:

$$Y + M - C = I + X$$

Since Y – C = S (where S is domestic savings):

$$M + S = I + X$$

This relationship can be rearranged focusing as internal and external factors:

$$M - X = I - S \text{----------} [02]$$

Trade-gap = Saving-gap

These two constitute two separate constraints, meaning that eliminating one does not get rid of the other. Planned investment in an economy can be financed by using domestic savings as well as through inflows of foreign capital. If we let (M – X) = F, then we can represent the equation [02] as follows:

F = I –S or as in the text I = F + S----------[03]

Total foreign inflows to a country could be in the form of foreign aid [FAID], foreign borrowing [FBR] or foreign direct investment [FDI].

In empirical literature, MaKinnon (1964), Chenery and Stout (1966), Findlay (1978) and others applied the Harrod-Dormar growth model to show that foreign capital inflows can raise the growth rate by raising the availability of capital for production, where the capital output ratio remains constant. With this theoretical and empirical literature, six exogenous variables affecting growth can be identified under the two-gap model. These include Exports (X), Imports (M), Investment (I), Foreign Aids (FAID), Foreign Debt (FD), and Foreign Direct Investment (FDI). If we assume non-inter-correlation between these variables and the existence of a linear relationship to GDP growth (GDPG), we can develop a linear function: ,

$$GDPG = \propto_0 + \propto_1 X + \propto_2 M + \propto_3 I + \propto_4 \text{FAID} + \propto_5 \text{FD} + \propto_6 \text{FDI} + \varepsilon \text{ [04]}$$

Where $GDPG$ is the annual average growth rate of real GDP, $\propto$ are coefficients, all the variables from X to FDI are ratios to GDP and ε defined as an error term.

FINDINGS AND DISCUSSION

We regress six independent variables in the right-hand side of the equation [04] against economic growth which is the dependent

variable in order to achieve the first objective of the study: "to examine whether or not the theoretical prescription of the two-gap model of economic growth holds in Sri Lanka?" during the country's second wave of trade liberalization (1989-2013).

Table 1: Model Summary

R^2	Change Statistics				
	R^2 Change	F Change	df1	df2	Sig. F Change
.466	.466	2.477	6	17	.066

The model summary in table 1 indicates that change of F statistic (2.477) is statistically significant at 10% confidence interval. It means that fitness of the model is statistically significant at highest level.

Table 2: Coefficients

Model	Standardized Coefficients		
	Beta	T	Sig.
(Constant)	-8.738	-1.350	.195
X	.198	.410	.687
M	-.316	-.664	.516
INV	.748	2.425	.027
GRANT	.192	.668	.513
DBT	.083	.236	.816
FDI	.228	1.101	.286

Estimated data in Table 2 shows that all the explanatory variables except imports are positively correlated with the GDP growth rate in Sri Lanka. Another important finding is that there is a strong relationship between investment and GDP growth rate in the study period. For example, *t* value (2.425) for the investment coefficient is statistically significant at 5% confidence level. On the question of external financial inflow, this study found that less contribution of

external debt to economic growth but relatively higher contribution of FDI in economic growth in the country. Although export sector contribution to GDP growth was positive, the coefficient is not statistically significant. The findings based on Table 2 support the idea that the Sri Lankan economy exhibits the theoretical prescription that the two-gap model of economic growth purports.

To prove this idea, we have to introduce a new variable, Current Account Balance of the BOP, to our analysis, and explore its relationship to investment which was relatively the most significant contributor to GDP in our estimated model. To see this we estimate the following simple regression:

$$CAB = f(In)$$

Where, CAB is the Current Account Balance of the Balance of Payments as a ratio of GDP and *In,* the investment ratio. The estimated equation appears below.

CAB = - 0.29 – 0.56(In)----------[05]

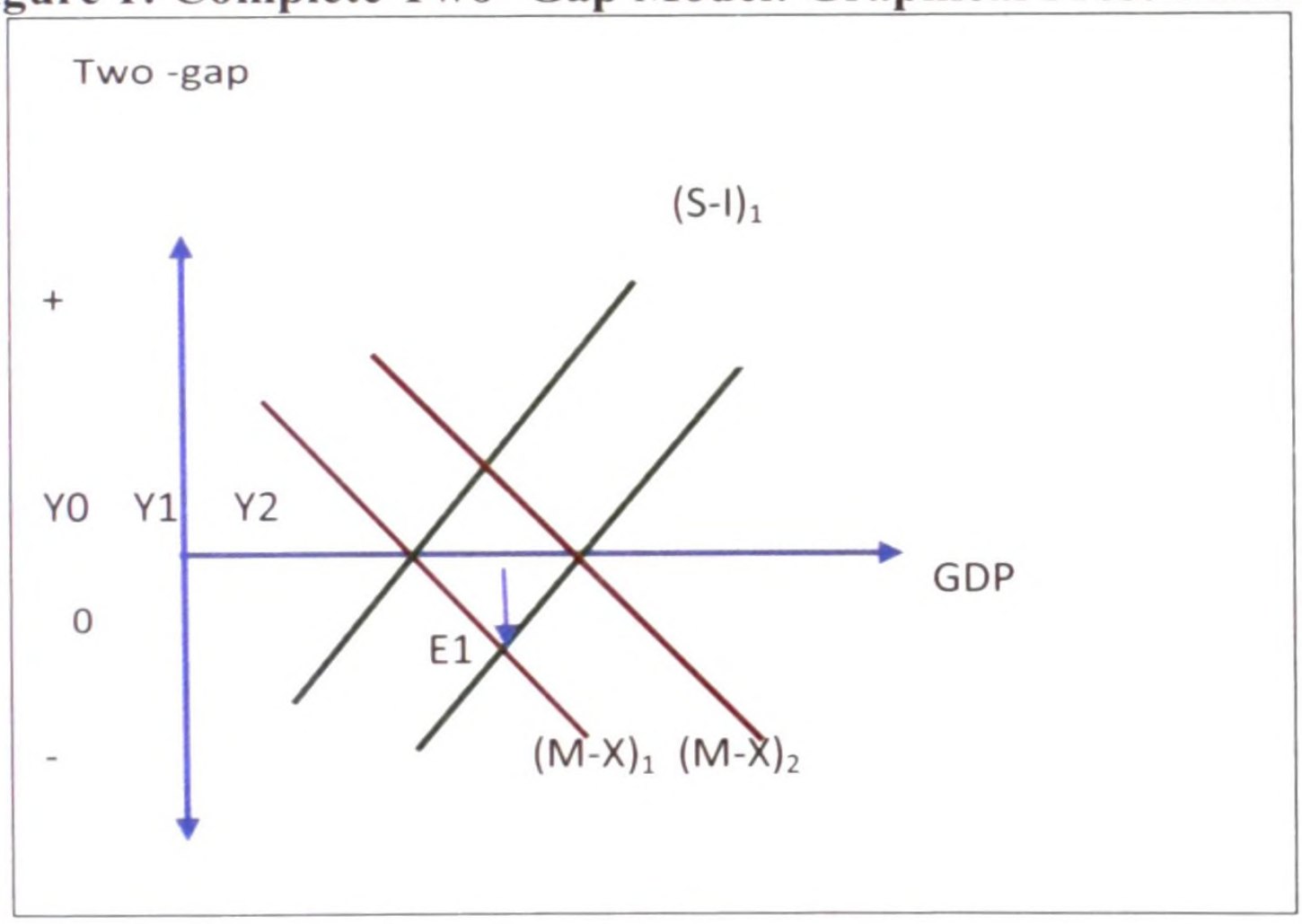
R^2 = 55, t = 3.155 and *sig 0.005*

Estimated equation [05] indicates that a 100 dollar investment in the economy results in a 56 dollar cents increase in the deficit of the current account balance of the BOP. Taking findings based on equation [04] and [05] together, it can be concluded that Sri Lanka's economic behavior can hold in the mid-way of the theoretical prescription that the two-gap model of economic growth postulated.

Now we can explore the second objective: how can the Sri Lankan economy be guided towards the correct path using policies which have been suggested by the two-gap model of development? To see this, we have to summarize the postulate made by the two-gap model of development.

Figure 1 explains the theory of the complete two-gap model of development, where the vertical axis measures two constrains: savings gap (S-I) and trade gap (M-X) while the horizontal axis represents the macro equilibrium or internal and external balance simultaneously.

Figure 1: Complete Two- Gap Model: Graphical Presentation



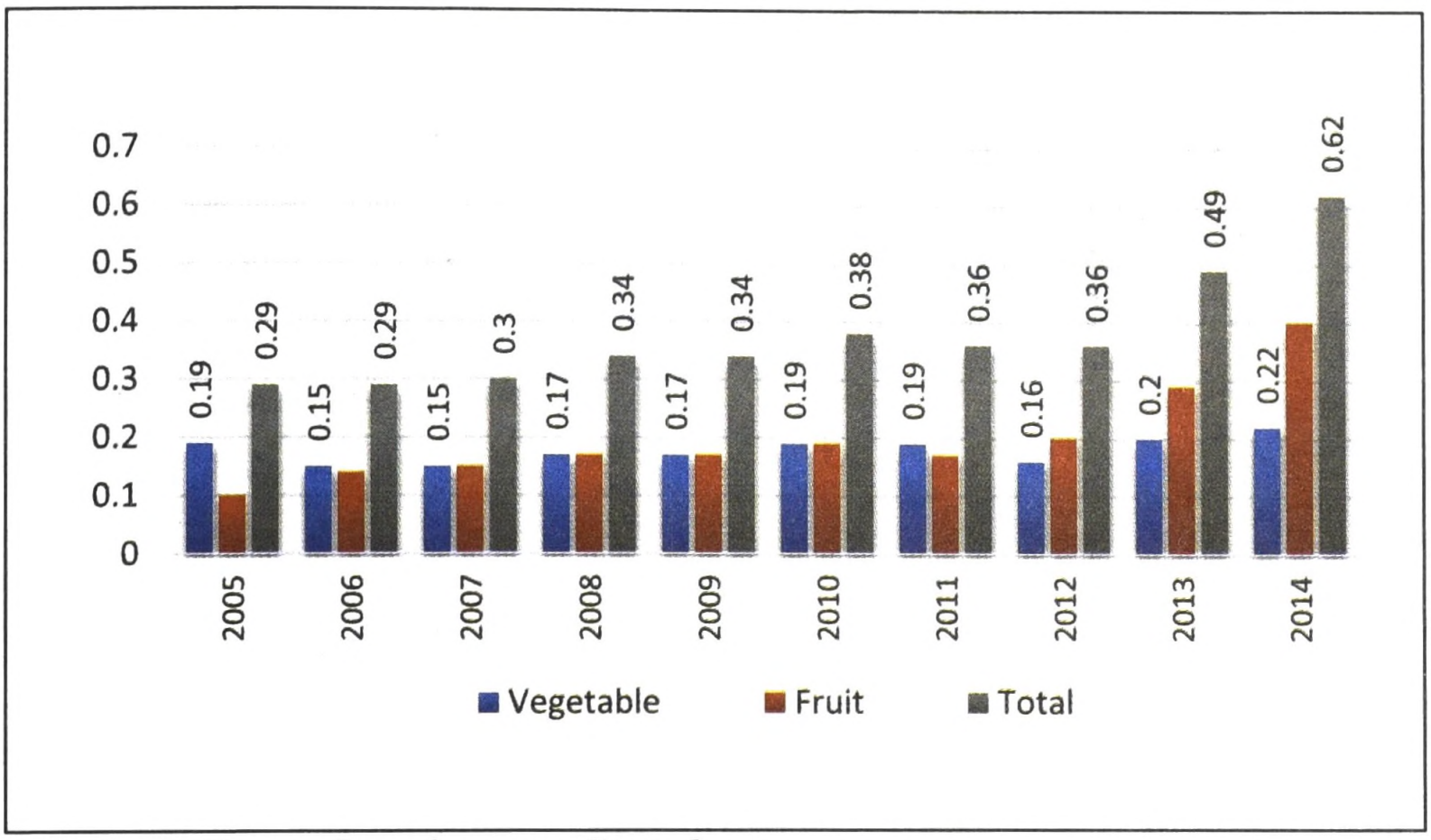
Initially the economy is in equilibrium at Y0 level of output - however this income level is far below the potential GDP (e.g. Y2). Now suppose the economy has planned a national investment project (without focusing any specific economic sector) using external financial sources expecting a higher level of growth. The policy will result the (S-I)1 curve in Figure 1 to shift rightward along (M-X)1 curve, and achieve a relatively higher level of equilibrium income Y1, corresponding to new equilibrium at point E1. At E1 however there is a widened current account deficit. As shown in Figure 1, Y1 is less than the potential level of GDP (Y2) in the economy, a theoretical characteristic similar to the current economic situation of Sri Lanka. The policy recommendation suggested by the two-gap model is that foreign inflows should be invested in the export sector which has the capability to gain a relatively greater competitive

advantage. This policy will result in a shift of the (M-X)1 schedule upward to (M-X)2 and a higher level of macro-equilibrium where external and internal balance can be achieved simultaneously.

The next important question is the choice of an appropriate export sector in which to invest foreign inflows (including FDI or grant or foreign debt) in order to hold the Sri Lankan economy in the two-gap model in development. In empirical literature, using panel data for 22 countries over 1984-2000, Asiedu (2005) found that presence of a number of conditions (or absolute advantages) including natural resources, large markets, educated population, openness, political stability and good governance support in gaining higher benefits from foreign inflow of capital. Since most of these conditions in Sri Lanka are fulfilled by the minor agricultural sector, we choose the fruit and vegetable sector as ideal for rural development using two-gap development model.

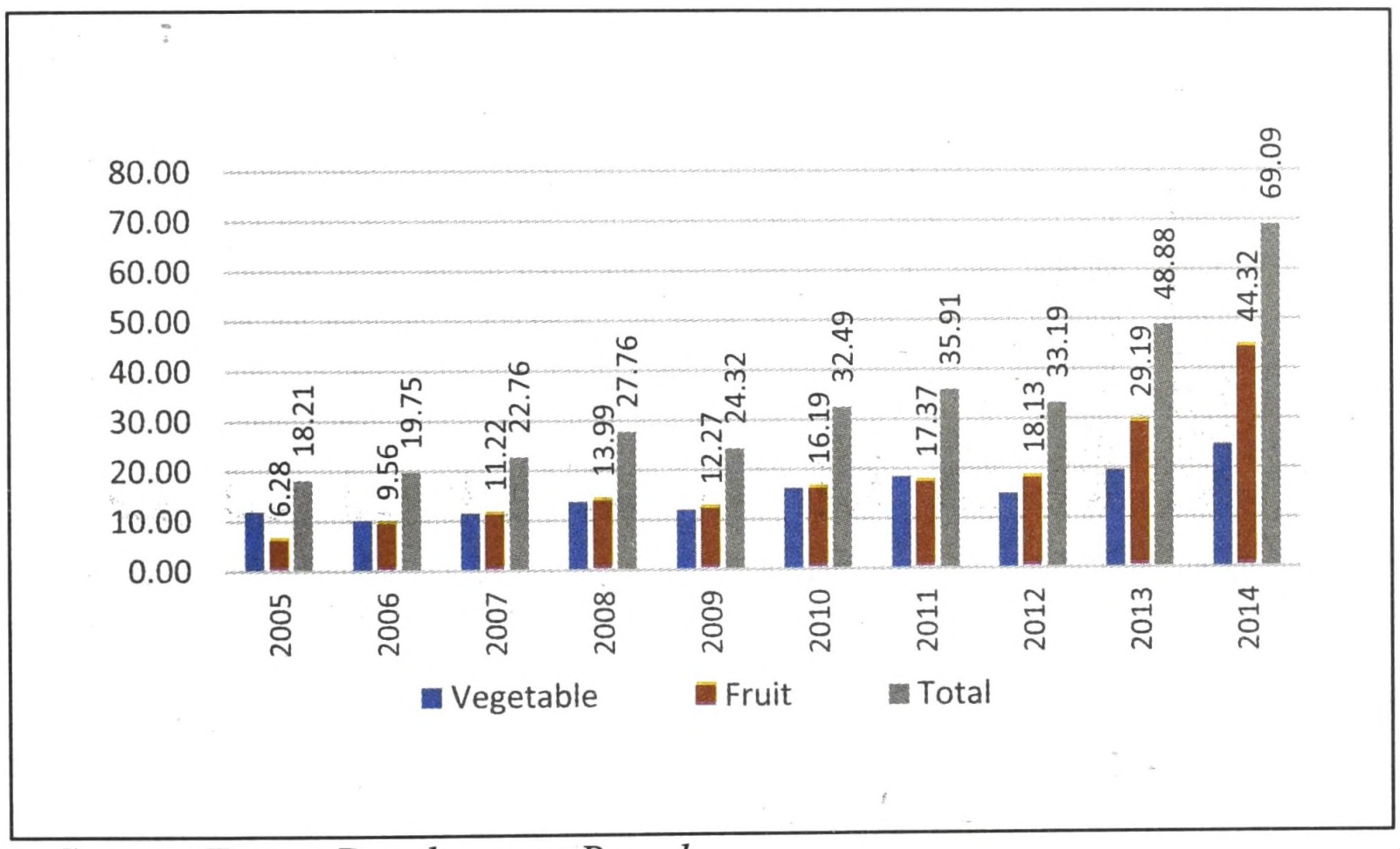
Why the Fruit and Vegetable sector? As shown combined Figure 2 and 3 for example, there is growing export performance in the fruit and vegetable sector of the country in terms of both the share contributed to merchandized exports and export earnings over the past decade. The other striking factor is that the sector has a large market worldwide (Figure 4 and 5).

Figure 2: Fruit and Vegetables Contribution to Merchandize Exports in Sri Lanka 2005-2014



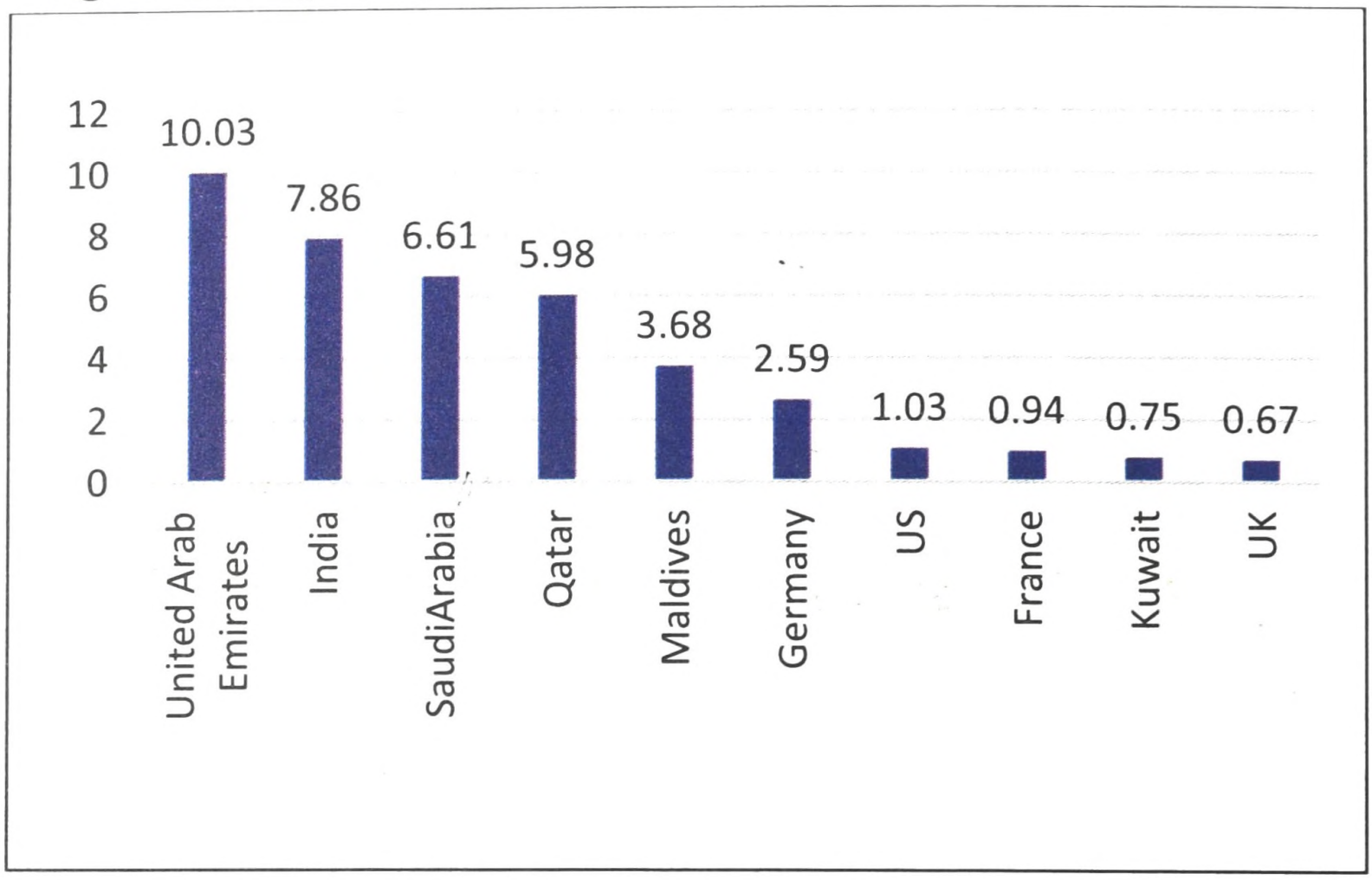
Source: Export Development Board

Figure 3: Export Performance Fruit and Vegetable Secrtor in Sri Lanka 2005-2014



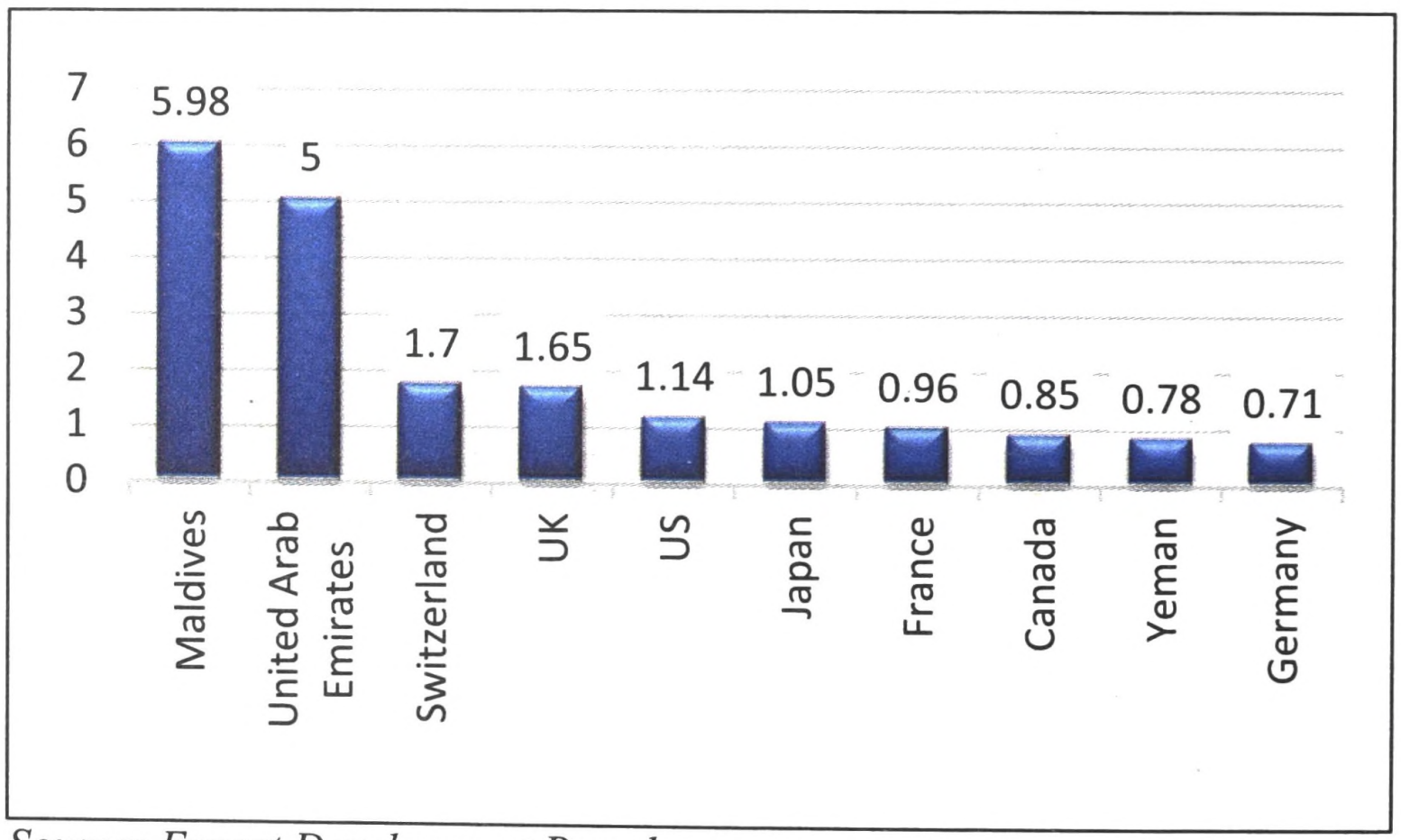
Source: Export Development Board

Figure 4: Major Market Fruit Sector in Sri Lanka 2005-2014



Source: Export Development Board

Figure 5: Major Market Vegetable Sector in Sri Lanka 2005-2014



Source: Export Development Board

In addition to the growing export performance of the fruit and vegetable sector, Sri Lanka has an absolute advantage due to its natural and man-made facilities, naturally rich soil, wide range of agro climatic zones, and well distributed rainfall patterns together with its strong network of irrigation facilities supported by an intelligent educated younger generation to facilitate uninterrupted production from the sector.

CONCLUSION

This study has explained the central importance of developing the fruit and vegetable sector in Sri Lanka for export led growth through rural development using the two-gap development approach. The most obvious finding to emerge from this study is that the Sri Lankan economy is currently experiencing the mid-way features of a two-gap development model. The findings of this study suggest that foreign financial inflows should be invested to develop the minor agricultural export sector, particularly the fruit and vegetable sector, to achieve internal and external balance in the country. The current findings add to a growing body of literature applying the exogenous growth model to small open economies like Sri Lanka. Future research should therefore concentrate on investigation into strategies to develop fruit and vegetable production as an export sector using new technologies and rural natural and human resource endowments.

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