CHAPTER 3

THEORETICAL FRAMEWORK

3.1 Introduction

This study attempts to provide an analysis of the role of international tourism in the long-term growth process from the point of view of growth theory, through mechanisms related to the demand side of the economy – the export-based models. The review of literature in the preceding chapter indicates that there are two models in which the relationship between trade (tourism in this case) and growth is explicitly stipulated. They are the open-economy Harrod-Domar model and the two-gap model developed by Chenery and associates (Voivodas, 1973).

3.2 The Open-Economy Harrod-Domar Model

The underlying assumption of the Harrod-Domar model (1948) is that the economic output of a country depends on the amount of capital invested. Labor is not a significant constraint on output as the model assumes that capital and labor are employed in fixed proportions. Accordingly, the production function is as follows:

$$dQ_t = \frac{1}{g} I_t \tag{3.2.1}$$

where Q is the gross domestic product in period t, g is the incremental capital-output ratio and I_t is the change in capital stock (dK_t).

The demand side of the model, showing how output is used, is captured in the following equations, in line with the Keynesian macroeconomic analysis:

$$S_t = sQ_t \quad (3.2.2)$$

where S is the total savings and s is the average and marginal propensity to save. Equation 3.2.2 is the savings function in which saving is a constant proportion s of income.

$$M_t = mQ_t \quad (3.2.3)$$

where M is the total imports and m is the average and marginal propensity to import. Equation 3.2.3 is the import function which determines imports as a constant fraction m of output.

$$X_t = X_0(1+e)^t \quad (3.2.4)$$

where X is the total exports and e is the given rate of growth of exports. Equation 3.2.4 is the export function in which exports are treated as exogenously given and their growth rate is assumed depend on the rate of growth of foreign output and the elasticity of foreign demand.

In equilibrium, the output allocation of an open economy can be expressed as the following macroeconomic accounting identity:

$$Y_t = C_t + I_t + X_t - M_t \quad (3.2.5)$$

Where $C_t = Y_t - S_t$, the following equality is derived:

$$I_t - S_t = M_t - X_t \tag{3.2.6}$$

where the $I - S$ is the saving-investment gap while $M - X$ is the current account balance. Equation 3.2.6 is the macroeconomic accounting identity which stipulates that in equilibrium, the saving-investment gap of an economy is equivalent to its current account balance.

Substitution of equations 3.2.2 and 3.2.3 into equation 3.2.6, the following is obtained:

$$I_t = sQ_t + mQ_t - X_t \tag{3.2.7}$$

Substitute equation 3.2.7 into equation 3.2.1 and divide both sides by Q_t, the following equation is derived:

$$\frac{dQ_t}{Q_t} = \frac{1}{g}\left(s + m - \frac{X_t}{Q_t}\right) \tag{3.2.8}$$

Equation 3.2.8 states that there is a negative relationship between the rate of growth of domestic output and the proportion of exports to total product. Since capital formation is the only source of growth while imports are solely for consumption purposes and there is no distinction between domestic and foreign capital, it follows that exports and investment compete for the limited domestic resources available in an economy. As such, the rate of growth of domestic product and exports are negatively related (Voivodas, 1973).

3.3 The Two-Gap Model of Chenery and Associates

The model developed by Chenery and associates (1962, 1966, 1970) is an extension of the Harrod-Domar model. The main difference to that of the Harrod-Domar model is that the analysis of this model focuses on the investment function in which both domestic and foreign capital goods enter in fixed proportions as follows: $I_t = \min(aI_t^d, bM_t^k)$, where I_t^d denotes domestic investment resources and M_t^k refers to imports of capital goods (Voivodas, 1973).

Since the two-gap model is an extension of the Harrod-Domar model, the essence of the model is simplified as follows:

$$dQ_t = \frac{1}{g} I_t \qquad (3.3.1)$$

$$S_t = sQ_t \qquad (3.3.2)$$

$$M_t = mQ_t \qquad (3.3.3)$$

$$X_t = X_0 (1+e)^t \qquad (3.3.4)$$

$$I_t = \min(aI_t^d, bM_t^k) \qquad (3.3.5)$$

$$I_t - S_t = M_t - X_t \qquad (3.3.6)$$

$$F_t = M_t - X_t \tag{3.3.7}$$

where F_t refers to the foreign exchange gap in which the trade gap $(M_t - X_t)$ is closed by the use of foreign capital F_t.

$$M_t = M_t^k + M_t^c \tag{3.3.8}$$

where M_t^k and M_t^c are total imports of capital goods and consumer goods respectively in period t.

$$I_t = I_t^d + M_t^k \tag{3.3.9}$$

where I_t^d refers to investment from domestic resources. Equation 3.3.9 is the investment function which indicates that total investment of an economy comprising both investment from domestic resources and imports of capital goods.

Based on the above equations, equations 3.3.1 to 3.3.4 of the model are essentially the same as the equations 3.2.1 to 3.2.4 in the open-economy Harrod-Domar model. What distinguishes this model from the open-economy Harrod-Domar model is equation 3.3.5 which states that the amount of capital formation of an economy is constrained by two limits, namely, the domestic investment (I^d) and the imports of capital goods (M^k).

When the economy faces the situation where there are sufficient imports of capital goods but insufficient domestically produced capital goods, the limit $I_t = aI_t^d$ arises. In other words, investment and growth of the economy are constrained by the limitation on domestic resources. Alternatively, when the economy has sufficient amount of domestic resources but insufficient amount of imported capital goods, the limit $I_t = bM_t^k$ emerge. In this case, investment and growth of the economy are constrained by the limitation on foreign resources.

Accordingly, the reduced form of the model differs depending on whether the binding constraint is the domestic or foreign resource. If the domestic constraint is operative, equation 3.3.5 is replaced by $I_d = aI_t^d$ and the reduced form of the model is as follows:

$$\frac{dQ_t}{Q_t} = \frac{1}{g}\left(s + m - \frac{X_t}{Q_t}\right) \qquad (3.3.10)$$

The equation 3.3.10 is identical to equation 3.2.8, the reduced form of the open-economy Harrod-Domar model. As in the Harrod-Domar model, equation 3.3.10 implies a negative relationship between the proportions of exports to the rate of growth of domestic product. Alternatively, if the foreign resource constraint is binding, equation 3.3.5 is replaced by $I_t = bM_t^k$ instead. Furthermore, since $M_t^k = F_t + X_t - M_t^c$, the reduced form of the model is as follows:

$$\frac{dQ_t}{Q_t} = \frac{1}{g}\left(\frac{X_t}{Q_t} + \frac{F_t}{Q_t} - \frac{M_t^c}{Q_t}\right) \qquad (3.3.11)$$

Equation 3.3.11 specifies a positive relationship between the proportion of exports to the rate of growth of total product, the intermediate link being the positive relationship between exports and capital goods imports (Voivodas, 1973).

In summary, both the open-economy Harrod-Domar model and the two-gap model where the domestic resources is the binding constraint, postulate a negative relationship between the proportion of exports to the growth rate of total product, the intermediate link being the negative relationship between exports and domestic investment. On the contrary, the two-gap model when the foreign resource is the binding constraint implies a positive relationship between the proportion of exports to the growth rate of total product, the intermediate link being the positive relationship between exports and capital goods imports.

3.4 Conclusion

In this chapter, the theoretical relationship between exports and domestic growth inherent in two models, namely, the open-economy Harrod-Domar model and the two-gap model by Chenery and associates are discussed.