The Scandinavian Model of Inflation: A Generalization and Empirical Evidence

HELMUT FRISCH*

Introduction

In this paper we consider an inflation model for a small open economy. "Smallness" is defined by the assumption that the economy meets an infinitely elastic demand and supply function for its tradable commodities, i.e., the country is assumed to be a price-taker in the world market. This implies that the rate of inflation of a small open economy depends upon the world rate of inflation. On the other hand, we observe a remarkable difference in the rates of inflation among various countries. Some Scandinavian authors like Odd Aukrust [1] and the group of authors Gösta Edgren, Karl-Olof Faxen and Claes-Erik Odhner [7] have proposed a simple model which links the rate of inflation of a small open economy with international price developments and which also allows for differences in the rates of inflation among countries. The Scandinavian model of inflation received recently an increasing attention by European economists analysing its theoretical underpinnings and its empirical content [4, 5, 10, 12, 14, 15, 17].

Crucial for the model is the division of the economy into two sectors. The exposed sector (E-sector) produces "tradables," i.e., commodities that compete on the world market, the sheltered sector (S-sector) produces "non-tradables," i.e., commodities which are not traded internationally. The model assumes further fixed exchange rates and explains the domestic rate of inflation through the world rate of inflation and a structural component which depends on domestic parameters.

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is the sum of the rate of inflation $\pi_E$ and the percentage rate of change of labor productivity in the $E$-sector $\lambda_E$, also exogenously given,

$$\pi_E = \pi_w$$  \hspace{1cm} (1)

$$w_E = \pi_E + \lambda_E$$  \hspace{1cm} (2)

Equation (2) implies that the wage-profit ratio in the $E$-sector remains constant. The firms in this sector (exporting or importing tradables) are price takers in the world market.

ii. The Wage Spill-over Hypothesis

It is assumed that the exposed sector acts as a wage leader. Through a spill-over effect from the $E$-sector to the $S$-sector the rates of wage increase are equal to the two sectors. 1

$$w_E = w_S$$  \hspace{1cm} (3)

$w_E = \text{percentage rate of change of money wages in the exposed sector, } w_S \text{ in the sheltered sector.}$

iii. Sheltered Sector

Prices in the sheltered sector are determined by a constant mark up on the unit labor costs, which means that the rate of inflation $\pi_S$ is the difference between the percentage change of money wages $w_S$ and the rate of change of labor productivity $\lambda_S$ in these sectors.

$$\pi_S = w_S - \lambda_S$$  \hspace{1cm} (4)

iv. Definition of the Rate of Inflation

The domestic rate of inflation $\pi$ is a weighted average of $\pi_S$ and $\pi_E$, with $\alpha_E$ and $\alpha_S$—the constant shares of the exposed and the sheltered sectors—as weights.

$$\pi = \alpha_S \pi_S + \alpha_E \pi_E$$  \hspace{1cm} (5)

with the restriction:

$$\alpha_S + \alpha_E = 1$$  \hspace{1cm} (6)

v. The Aukrust-EFO Equation

The Aukrust-EFO formula is easily obtained from the 6 equations:

$$\pi = \pi_w + \alpha_S (\lambda_E - \lambda_S)$$  \hspace{1cm} (7)

All variables on the right hand are exogenous. The inflation rate of a small, open economy is thus fully explained both by the world inflation, $\pi_w$, and by the difference in the rate of growth (RG) of the labor productivity of both sectors; this difference being weighted through $\alpha_S$, the share of the sheltered sector.

The Aukrust-EFO equation explains in this way the rate of inflation in terms of the “imported” inflation, $\pi_w$, and of the “structural” component, $\alpha_S (\lambda_E - \lambda_S)$. G. Maynard and W. van Rijckeghem [14] speak of the “structural” inflation hypothesis, since the rate of inflation is independent of the excess demand in this model and depends only on the productivity gap in both sectors. 2 The greater this gap, the greater is the cost-push inflation in the $S$-sector and consequently the domestic rate of inflation.

The Austrian example may illustrate the Aukrust-EFO equation. For the period 1960-1970 the following relationships are true:

1 Edgren, Faxen, and Odhner [7, p. 22] conclude for Sweden:

"The development of wages in different branches is strikingly parallel. From the competing sector wage impulses proceed to the sheltered industries, both through the market mechanism, i.e., through the necessity of raising wages equally in this part of the economy in order to ensure a supply of labour, and through the wage policy based on the solidarity principle. The market mechanism makes itself felt both in wage negoti-

2 The basic idea of a “structural” inflation is very common among European economists. For example, R. J. Ball and T. Burns use implicitly the Scandinavian model to explain the inflationary mechanism in the UK [2, p. 476]:

"The faster the productivity rises in the traded sector, then the faster nontraded prices will rise relative to traded prices and the faster the retail price index will rise relative to export prices. A similar effect will result the higher is the share of nontraded goods in the economy."