Chapter 4

Theoretical Framework

4.1 Introduction

Based on previous empirical studies discussed in Chapter 2, the hypothesis we postulate is that changes in labour productivity have a positive impact on the growth of real wages. In this study, the model proposed by Carneiro (1998) will be adopted to analyze the wage formation process in Malaysian manufacturing.

4.2 Model Specification

The Carneiro model (1998) is based on a conventional model of wage bargaining in which wages are determined after negotiations between the firm and the local union. The underlying principles used in verifying the effects of productivity in Malaysian manufacturing wage formation is as follows:

It is assumed that there is bargaining over wages between the union and the firms. Once both parties agree upon a particular wage level, the firm will determine the number of workers to hire so as to maximize profits.

The level of employment given a particular bargained wage is given by:

$$N_i = N_i(W_i / P^e(1+H), X_i) \tag{4.1}$$

where W = the bargained nominal wage.

P^e = is the expected consumer price level.

H = is the tax wedge capturing the difference between employer labour cost and workers take-home pay. It is measured as the ratio between real employers labour cost (deflated by the industrial price index) and the post-tax consumption wage.

X = is a vector of other variables determining the position of the labour demand schedule which may include other factor prices and input levels and aggregate demand conditions.

The firm's utility will depend on the amount of profit, π_i, associated with these wage/employment combinations, over and above some fall back level[10], π_0:

$$\pi_i = \pi_i(W_i / P^e(1+H), X_i) - \pi_0 \tag{4.2}$$

If we assume the firm faces a single trade union with utilitarian preferences then the union's utility can be written as:

$$V_i = N_i(V_i(W_i / P^e) - V_0) \tag{4.3}$$

[10] The fall back utility of the firm depends on the fall in production due to a wage dispute, and the fall back utility of the union is likely to depend on the size of strike funds and other related factors.

where $V(.)$ is the union's utility from the bargained wage when an agreement is reached, and V_0 is a fall back utility. In order to introduce the possibility of insider bargaining preferences, we must consider the separation of insiders from potential employees outside. Denoting union membership as M, and assuming that all union members are employed at a given time, equation (4.3) can be written as:

$$V_i = M_i.(V_i(W_i / P^e) - V_0) + \alpha(N_i - M_i).(V_i(W_i / P^e) - V_0) \qquad (4.4)$$

where α is the weight given by the union bargainers to the utility of outsiders. When α=0, the union will bargain a wage to maximize the utility of its members, ignoring completely the potential employment of outsiders. So once full employment for all members is achieved the union will place no utility weight on higher N_i and will only care about higher W_i.

The determination of the nominal wage rate then can be described by the solution to an asymmetric Nash bargaining:

$$W_i = \arg\max(.) = [V_i(.)]^{\beta}[\pi_i(.)]^{1-\beta} \qquad (4.5)$$

The parameter β in equation (4.5) captures the relative power of two sides in the wage bargain and is usually proxied by a measure of union power, such as union density. As β tends to 1, the union sets the wage unilaterally while the firm sets employment at its

profit maximizing point given the wage; i.e., the union chooses the wage that will maximize its welfare function subject to the constraint of a downward-sloping labour demand schedule. In doing so, it trades off the gains from raising real wages against the employment loss that will follows.

If $\beta = 0$, the firm can choose a wage level and associated employment level to maximize its profits only constrained by having to pay workers the fall-back wage level; and for $0 < \beta < 1$, any quasi-rents originating from a monopolistic product market or monopsony in other factor markets are shared between the union and the firm.

The wage equation of the following implicit form, therefore, is obtained from the first order condition for maximization of equation (4.5).

$$W_t = W_t(P^e, N_t, M, H, \beta, X) \tag{4.6}$$

The appropriate expected prices will be captured in aggregate through a consumer price index. The bargaining power parameters, β, is proxied through variables such as union density or strike intensity.

4.2.1 The Long-Run Wage Relationship

This study adopts the methodology of Carneiro (1998) to analyze the relative changes of labour productivity on wages in manufacturing industries. As there are difficulties in obtaining, and/or the lack of variables measuring tax wedge, we are left with a more limited choice on the selection of our explanatory variables. Therefore, we used consumer price (P), labour productivity (PROD), unemployment rate (UNEMP) and union density (UD) as our main explanatory variables. The wage equation is modified from equation (4.6) and is described as below:

$$W_t = \beta_0 + \beta_1 P_t + \beta_2 PROD_t + \beta_4 UNEMP_t + \beta_5 UD_t + u_t \tag{4.7}$$

Based on the economic theories, we should expect consumer price, labour productivity, and union density to yield positive effects on wage equation. Labour productivity gains increases wage because higher labour productivity will result in higher corporate profits, which unions then use to justify wage settlements gains, to effect the redistribution of profits from capital to labour. As union density increases, it gives workers greater bargaining power to gain better wages and working conditions than in a nonunion system of individual bargaining. However, unemployment rate will yield a negative effect on wage movements because as the number of unemployed workers increase, there are willing to accept a lower wage paid.

4.2.2 The Short-Run Wage Dynamics

The short-run wage dynamics of Malaysian manufacturing can be modeled using the Engle and Granger (1987) approach. The Engle and Granger theorem establishes that if a group of variables form a valid cointegrating vector then it is possible to obtain a valid error correction term representing the deviation of observed values from the long run equilibrium. The error correction representation of a cointegrated series allow for the separation of the long run and short run responses of a given meaningful relationship.

The Engle and Granger two-step cointegration procedure incorporates both the economic theory relating to the long-run relationship between the variables, and the short- run disequilibrium behaviour. In the first stage, the long run wage equation [equation (4.7)] is estimated by Ordinary Least Square (OLS) and the residuals are tested for stationarity. The residuals of the long run wage equations are then kept as an error correction term to capture long run disequilibrium in a short run dynamics model.

The short-run dynamic model have the following specifications,

$$\Delta rw_t = \beta_0 + \beta_1 \Delta PROD_t + \beta_2 \Delta UNEMP_t + \beta_3 \Delta UD_t + \beta_4 \Delta v_{t-1} + \varepsilon_t \qquad (4.8)$$

where ν is the cointegrating vector's residuals (the ECM term), β_0 to β_4 are coefficients and ε is an error term assumed to be white noise. So the rate of change in real wages, Δrw_t is determined by the rate of change in labour productivity ($\Delta PROD_t$), unemployment rate ($\Delta UNEMP_t$), union density (ΔUD_t) and feedback via the error

correction term (ν_{t-1}), from the deviation between the actual and the long-run equilibrium values of real wages in the previous period.

4.3 Conclusion

The wage equation model used is based on the framework of wage bargaining between the firm and the local union. Within a union-firm bargaining framework, the long-run wage equation is the solution to a right-to-manage model. For the short-run wage dynamics, it is based on the Engle and Granger theorem which the theorem permits the separation of the long-run equilibrium information from the short-run dynamics of the wage equation relationship.