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In Defence of Labour Market Institutions

Cultivating Justice in the Developing World

Edited by
Janine Berg and David Kucera
If you wish for peace, cultivate justice
—ILO motto
7
What Can the Labour Demand Function Tell Us About Wages and Employment? The Case of the Philippines

Jesús Felipe and J.S.L. McCombie

...what is not so easy to explain is the fact that the marginal product of labor in such an estimated relationship [aggregate production function] appears to give a reasonably good explanation of wages as well.

F.M. Fisher

...not everyone is convinced about how much we really know on even the simplest question -- the constant-output own-price elasticity of demand for aggregate labor. ...Because this parameter is fundamentally important for understanding the impacts of such diverse policies as payroll taxation, subsidies for employment growth, and others, one wonders whether there is any hope of convincing skeptics that something can be known. Part of the reason for the skepticism may be the fact that most empirical research is based on labor markets in industrialized countries.

D.S. Hamermesh

7.1 Introduction

Since the 1980s, when discussions about the meaning and implications of the term globalization started to appear in the press and academic journals, policy-making in many countries has been dominated by the objective of increasing competitiveness. Unfortunately, the ambiguity with which this term is often used (in particular, its meaning at the national level) has led to a great deal of confusion in terms of policy recommendations. Most often, however, concerns about the need to be competitive are translated into recommendations for wage restraint. Indeed, the heralded normative goal of competitiveness, at times being pursued with an ideological zeal, has put enormous pressure on workers. The consequence is that a great deal of
anxiety is being felt all over the world because the situation is possibly leading to a ‘race to the bottom’, according to which globalization is forcing workers to compete to attract capital by accepting lower wages. This means that the concept of competitiveness seems to be driving economic policy in many countries, hence the emphasis on costs, productivity and labour market reform in order to achieve greater ‘flexibility’ in the labour market. Wage restraint and limitations on social expenditures (such as reduction and even elimination of workers’ benefits, such as unemployment subsidies or minimum wages) are seen as necessary conditions for improved economic performance.

In this context, one of the most enduring controversies in macroeconomics has been, and remains, the question of whether or not unemployment can be largely attributed to real wages being too high. The classical (and neoclassical) argument is that unemployment arises as a result of wages being set above the market-clearing level for reasons such as efficiency wages, collusion among workers, or due to the juxtaposition of institutional forces different from supply and demand. These institutional forces are minimum wages, labour unions, public sector pay policies, multinational corporations and labour codes. These forces create inflexible labour markets. In this model, increases in real wages will cause employment to decline for two reasons: (i) higher wages will induce firms to substitute other inputs for labour; and (ii) higher wages will entail cost increases, which induce buyers to shift suppliers. From a policy perspective, adherents to this view contend that a competitive market has an internal mechanism that allows it to eliminate unemployment; in particular, that a competitive economy has a long-run tendency to full employment. This mechanism is the speedy adjustment of wages to their equilibrium level, at which labour demand equals supply. Thus, existing unemployment is the result of workers refusing to accept the equilibrium wage rate as determined by labour demand and supply. The policy implication, and the solution to the unemployment problem, is seen as more competition and less government intervention in the market through, for example, the setting of minimum wages or through ensuring job security. In competitive markets, the law of demand and supply ensures that eventually the demand for labour will equal the supply of labour – so that the labour market will clear and there will be no unemployment: The most important policy prescription of this paradigm is that, in order to eliminate unemployment, it is necessary to reduce real wages by cutting the money wage rate.

The theoretical refutation of the simplistic conclusion that a reduction in money wages increases employment was seen initially as one of the central achievements of Keynes’ General Theory. The standard argument is that the reduction in wages reduces the cost of production. Under these circumstances, firms believe that they can sell at higher profit. This would stimulate business and, as a consequence, employment would increase. But is this true? Keynes argued that profits would increase only if the community’s marginal propensity to consume is equal to unity . . . or if there is an increase in investment, corresponding to the gap between the increment in income and the increment in consumption. Unless one of these two conditions is fulfilled, the revenue from increased output will be less than what entrepreneurs expected and thus employment will not change. If entrepreneurs offered employment on such a scale that provided the public with incomes out of which they would save more than the amount of current investment, firms would make a loss equal to the difference. This will be so irrespective of the level of money wages. Thus, increased flexibility (i.e., the possibility of reducing the cost of production) need not lead to higher employment.

Subsequently, however, the question has been interpreted as being essentially an empirical issue. Hamermesh has provided a comprehensive survey of the literature and although the estimates of the elasticity vary often quite considerably between studies, they are nearly always statistically significant and negative: ‘If one were to choose a point estimate for this parameter [the elasticity of labour demand], 0.30 would not be far wrong.’ This is roughly the same figure Cobb and Douglas found and is consistent with a labour share of 0.7. As Hamermesh further remarks, ‘the immense literature that estimates the constant-output demand elasticity for labor in the aggregate has truly led us “to arrive where we started and know the place for the first time”’. Today’s mainstream explanation for unemployment is that labour market institutions are ‘too rigid’ and wages are ‘too high’. Often, the theoretical models used to support these conclusions tend to be variants of the non-accelerating inflation rate of unemployment (NAIRU). The OECD and IMF, for example, have insisted for several years that, in order to accelerate growth, Europe has to reform its labour markets so as to make them more flexible, following the American approach. But the argument over the need to reform labour markets is also sweeping across developing countries. This is the case advanced, for example, by Heckman and Pagés in the case of Latin America. The conclusions of the country studies contained in their volume lead them to advocate labour market reforms with a view to making labour markets more flexible. Heckman and Pagés summarize estimates of constant-output labour demand elasticities for Latin America from 11 studies. The estimates range between 0 and 0.5 and most of them are between 0.2 and 0.6. In the authors’ words: ‘This range of estimates implies that a 10 per cent increase in labour costs will result in a sizeable decline in employment, between 2 per cent and 6 per cent.’ Likewise, Hamermesh shows estimates of constant-output own-wage labour demand elasticities from seven studies, also for Latin American countries. He concludes, ‘Despite the obvious differences, the results are remarkable for their apparent consistency . . . the average constant-output own-wage elasticity is −0.30 . . . taking all the elasticities together, one must infer that they reinforce the consensus estimate, −0.30, that I identified’. Hence, Hamermesh seems to imply that it is reassuring that the same result appears in estimations of labour demand functions for
developed and developing countries. Finally, Cárdenas and Bernal also find negative wage elasticities of labour demand at the firm level (a sample of 2,570 Colombian manufacturing firms) and at the industrial sector (a panel of 92 industrial sectors for 1978–95). These results, taken as a whole, have been seen by some as confirming the neoclassical view that an increase in the real wage, ceteris paribus, will increase unemployment by lowering the demand for labour.

In this chapter we contend, however, that this alleged empirical evidence does not necessarily validate the theoretical claims. Hence we are sceptical about how much can be learnt from these exercises. The problem is that the neoclassical labour demand function is derived from an aggregate production function. It has been well established for some time now that the use of value data (either value added or gross output) poses intractable problems for the interpretation of any statistical estimate derived from aggregate production functions. In this chapter, we show that because of an underlying accounting identity, it is possible to obtain a negative value of the elasticity of labour demand with respect to the wage rate, although there may be no underlying behavioural relationship. Indeed, it is very difficult to obtain anything other than a statistically negative ‘elasticity’. In fact, with real data, it is practically impossible. The reason is that all that is being estimated is an approximation of an identity, that is, of course, true by definition. This result questions the validity of many empirical estimations of labour demand functions and the policy implications often derived from them.

The rest of the chapter is structured as follows. In section 7.2 we summarize the standard derivation of the wage elasticity of demand for labour and the negative relationship between employment and the wage rate. In section 7.3 it is argued that there is a more parsimonious interpretation for the observed negative relationship between these two variables and is observed in estimating neoclassical labour demand functions. This is that the results are driven by the accounting identity according to which output is the sum of the wage bill plus total profits. Sections 7.4 and 7.5 illustrate the argument in the context of the Philippines. We must make it clear that the empirical analysis we provide is for illustrative purposes only. The theoretical argument shows, per se, the insurmountable problems involved in the econometric estimation of aggregate labour demand functions.

What we provide here, step by step, is a more parsimonious interpretation of the results. The purpose of these two sections is also to address and question Hamermesh’s view, quoted at the start of this chapter, that there may be scepticism about how much can be known about the constant-output own-price elasticity of demand for aggregate labour due to the fact that most empirical research refers to the developed countries. In section 7.4 we analyse the relationship between minimum wages and employment in the context of the marginal revenue product curve. As noted above, for all practical purposes, virtually all data sets will yield a negative relationship between these two variables. This section explains the unusual circumstances under which this could occur. In section 7.5 we review the problems interpreting the estimates of the labour demand function. Section 7.6 evaluates the impact of changes in the minimum wage rate on the average wage rate of the Philippines. The results of the empirical analysis indicate that the effect of increases in the minimum wage is insignificant. Section 7.7 concludes. Annex 7.1 summarizes Lavoie’s arguments about the problems estimating the NAIRU model as specified by Layard, Nickell and Jackman. The argument is that what drives the empirical results is the accounting identity according to which output equals the sum of the wage bill plus total profits. Lavoie’s (2000) paper was published in French and hence is not known to many scholars of labour economics.

7.2 Derivation of the elasticity of demand for labour

The theoretical foundations of the labour demand function are based on standard neoclassical assumptions. A well-behaved aggregate production function \( Q = F(K, L) \) is assumed to exist, where \( Q \) denotes the constant-price value of output and \( K \) denotes the constant-price value of the capital stock. Perfect competition is usually, but not always, assumed to prevail and factors are paid their marginal products, i.e., \( w = F_w \) and \( v = F_v \), where \( w \) and \( v \) are the real wage rate and the real user cost of capital, respectively. In order to derive the elasticity of demand for labour, two different assumptions are made – the first holding output constant, the second holding capital constant – which lead to different functional forms.

(i) Holding output constant: In this first case, output and the user cost of capital are held constant. On the other hand, capital and labour vary as the relative price of inputs changes. The elasticity of demand for labour is obtained by solving the three-equation system given by differentiating the production function and the two first-order conditions. This yields \( \eta_{LLQ} = -(1-\alpha)\sigma \), where \( (1-\alpha) \) is the share of capital in total output (assumed to be equal to capital’s output elasticity) and \( \sigma \) is the elasticity of substitution.

Assuming the production function is the Cobb–Douglas \( Q = A_0 K^{\alpha} L^{1-\alpha} \), the three-equation system leads to the equation:

\[
\ln L = \frac{-\ln(1-\alpha)\ln[(1-\alpha)/\alpha]}{\lambda t + \ln Q - (1-\alpha)\ln w + (1-\alpha)\ln v}
\]

(7.1)

where the estimate of \( \ln w \) is the elasticity of demand for labour, given that \( \sigma = 1 \) (Cobb-Douglas). In this case, if the firm is in equilibrium and there is perfect foresight, given \( a = \alpha = 0.75 \), if we were to estimate \( \ln L = c + b_1 t + b_2 \ln Q + b_3 \ln w + b_4 \ln v \), we should expect that \( b_2 = 1.0 \), \( b_3 = -0.25 \) (the elasticity of demand for labour) and \( b_4 = 0.25 \).

A second procedure uses the Cobb-Douglas cost function and Shepard’s lemma: \( \partial C/\partial w = L \). The cost function is given by \( C = Bw^{\alpha} v^{1-\alpha} Q e^{-\lambda t} \).
Differentiating with respect to the real wage rate and expressing the result in logarithmic form leads to expression (7.1).

Alternatively, one can use the marginal revenue product of labour curve to obtain an estimate of the elasticity of demand for labour. This can be obtained by differentiating the total revenue function with respect to labour. In the case of the Cobb–Douglas; this yields:

$$\ln L = \ln \alpha + \ln Q - \ln w$$

(7.2)

In this case, the elasticity of demand for labour can be obtained from the estimate of the intercept as \(\hat{\eta}_{LL/Q} = -[1 - \exp(\ln \alpha)] = \hat{\alpha} - 1\), and it is important to emphasize that it is not given by the coefficient of \(\ln w\). A negative elasticity implies that the estimated intercept must be negative.

Given that the Cobb–Douglas production function implies \(\sigma = 1\), researchers often work with a CES production function \(Q = A(\theta)[dL^{-\sigma} + (1 - \delta)K^{-\sigma}]^{1/\delta} \) where \(\delta\) is a distribution parameter and \(\sigma = \frac{1}{1-\rho}\) is the elasticity of substitution, to derive estimates of the elasticity of demand for labour. Following a procedure similar to that above leads to \(\ln L = \ln A_0 + \ln \delta + \frac{\ln \delta}{\delta + 1 - \delta} + \frac{(1 - \frac{1}{\delta})}{\delta} \ln Q - \ln \delta \). However, given the nonlinear nature of this form, it is rarely, if ever, used. Instead, what is used is the marginal revenue product curve, obtained by differentiating the total revenue function with respect to labour. This yields:

$$\ln L = (1 - \sigma) \ln A_0 + \sigma \ln \delta + \sigma \ln w + \ln Q - (1 - \sigma) \lambda t$$

(7.3)

As in the Cobb–Douglas case, this form avoids the need to use the user cost of capital, and it has the advantage that it is more flexible. The elasticity of demand for labour is obtained by multiplying the estimated elasticity of substitution \(\hat{\delta}\) times the capital share in total output from the national accounts. It can be seen that as \(\sigma \to 1\), equation (7.3) tends to \(\ln L = \ln \alpha + \ln Q - \ln w\), which is equation (7.2).

(ii) Holding constant capital: In this case, it is assumed that the capital stock is constant, in which case output varies. If the capital stock remains constant, then as employment falls, with a rise in the real wage rate, output will decrease. In this case, the elasticity of demand for labour is given by \(\hat{\eta}_{LL/K} = -\alpha/(1 - \alpha)\), where, as before, the capital share in output is assumed to be equal to the elasticity of output with respect to the capital stock.

In the case of the Cobb–Douglas function \(Q = A_0 e^{\alpha L/K} K^{1-\alpha}\), one can estimate the change in output as labour changes with the capital stock held constant, directly from the expression for the marginal productivity of labour \(\frac{dQ}{dL} = w = \alpha A_0 e^{\alpha t} / K^{1-\alpha}\). Rearranging this expression and writing it in logarithms leads to:

$$\ln L = c + \left(\frac{\lambda}{1 - \alpha}\right) t - \left(\frac{1}{1 - \alpha}\right) \ln w + \ln K$$

(7.4)

where since the elasticity of demand for labour equals in this case \(\hat{\eta}_{LL/K} = -1/(1 - \alpha)\), it is directly given by the estimate of \(\ln w\).

For estimation purposes, equations (7.1) to (7.4) are estimated today using modern econometric methods. For example, with time-series data, researchers would test for unit roots and the possibility of co-integration among the series.

### 7.3 A more parsimonious interpretation

In this section we propose a more parsimonious interpretation of the equations used to derive estimates of labour demand. In doing so, there are two issues that must be taken into consideration. The first issue is the nature of the labour demand function, as discussed above, is a concept without a satisfactory theoretical foundation. The reason is that in order to derive it, one needs to assume the existence of the aggregate production function. This means that the implications of the Cambridge Capital Theory Controversies are either ignored or assumed unimportant. Likewise, the serious aggregation problems in production functions are sidestepped. These are not innocuous issues, for both the Cambridge Capital Controversies and the aggregation literature proved conclusively that aggregate production functions, as well as the notion of an aggregate stock of capital, have no theoretical foundations, except under extremely restrictive and implausible assumptions. It can be said therefore that the aggregate production function does not exist. By this, it is meant that the aggregate production function cannot be derived in an internally consistent manner and, therefore, it is a problematic concept. This implies that the concepts of a labour demand curve and the wage elasticity of demand for labour must be seriously questioned.

The second consideration is that given the previous point, the relevant question must be one of how to interpret empirical estimates of equations (7.1) to (7.4), given that they are not estimates of aggregate labour demand functions or of marginal revenue curves (this is because they do not exist, in the sense explained in the previous paragraph). To answer this question it should be noted that, in practice, data used in the estimation of these equations are not physical quantities but value data, constant dollars of output and capital stock. This has very important implications, as we shall see. The reason is that we are bound to obtain a close statistical fit to the above equations, purely because of the existence of an underlying accounting identity. For example, an alternative interpretation of these equations is that all that
is being estimated is a pricing equation and the negative coefficient of $\ln w$ is simply a consequence of this. In these circumstances, the inverse relationship between $L$ and $\ln w$, ceteris paribus, has no causal significance whatever. To see this, let us assume that the $i$th firm pursues a constant mark-up pricing policy on unit labour costs:

$$p_i = (1 + \pi_i)w_i^nL_i/q_i$$  \hfill (7.5)

Where $p_i$ is the price in, say, dollars per unit output, $\pi_i$ is the mark-up, $w_i^n$ is the nominal money wage and $q_i$ is the output measured in homogeneous units. Let us, for illustrative purposes, further assume that the underlying micro production function is one of fixed coefficients, so that relative prices have no effect on the choice of the ratio of factor inputs. Total value added is given by $PQ = \sum p_iq_i = \sum (1 + \pi_i)w_i^nL_i$, where $P$ is the value-added deflator and $Q$ denotes real value added.\(^{32}\) For expositional ease, let us further assume that this equation may be approximated by $PQ = (1+\pi)w^aL_i$, where $w^a$ is the average nominal wage rate. If $1 + \pi$, the average mark up, is, say, 1.33, this implies that labour’s share will be constant and will take a value of 0.75.

For every firm (and every industry) there is an associated identity for real value added:

$$Q_i = w_iL_i + r_iK_i$$  \hfill (7.6)

where $Q_i$ is real value added, $K_i$ is a constant-price value measure of the capital stock, $w_i$ is the real wage rate and $r_i$ is the ex-post real profit rate. Aggregating gives the accounting identity:

$$Q = wL + rK$$  \hfill (7.7)

where $w$ and $r$ are the average real wage and profit rates.\(^{33}\) This may be expressed in growth rates as:

$$\dot{Q} = a_0\dot{w} + (1-a_0)\dot{r} + a_1\dot{L} + (1-a_1)\dot{K}$$  \hfill (7.8)

where the circumflex denotes growth rates. The shares have time subscripts as they vary over time. If they are constant, equation (7.8) may be integrated to give:

$$Q_i = Bw^aL_t^{1-a}K_t^{1-a}$$  \hfill (7.9)

If, as is often empirically the case, $w$ is strongly trended and $r$ is roughly constant, then equation (7.9) may be expressed as:

$$Q_t = A(t)L_t^aK_t^{1-a}$$  \hfill (7.10)

where $A(t) = A_0 \exp(\lambda t)$ and $\lambda = \alpha \dot{w}$ (as $\dot{t} \equiv 0$). Hence, if we were to estimate $\ln Q_t = c + b_1t + b_6\ln L_t + b_7\ln K_t + e_t$ then simply by virtue of the identity, the estimate of $b_6 = a$ and $b_7 = 1-a$.

The key issue here is to understand what equation (7.10) is. Clearly it is not a Cobb-Douglas aggregate production function. This is because we know that it does not exist; and secondly, because of how equation (7.10) has been derived: it is simply the accounting identity equation (7.7), rewritten under the assumptions that factor shares are constant and that $aw_i + (1-a)\dot{r}_i$ is also constant, equal to $\lambda$. Provided these assumptions are more or less correct empirically, equation (7.10) will provide an excellent fit to the data, even though the aggregate production function does not even exist (again, in the sense explained at the beginning of this section).\(^{34}\) This argument may be easily generalized. Suppose factor shares are not constant over time, but vary, then equation (7.10) will not give the best fit to equation (7.7). What we require is a more flexible approximation, such as the CES or translog.\(^{35}\) However, we insist that these should not be regarded as ‘production functions’, per se, but simply as mathematical transformations that give a good approximation to equation (7.7).

The second important implication of this result, crucial for the purposes of this chapter, is as follows. Rearranging the identity equation (7.9) and taking logarithms, we may express it as:

$$\ln L = -\ln B + (1/a)\ln Q - \ln w - [(1-a)/a]\ln r - [(1-a)/a]\ln K$$  \hfill (7.11)

What does this result mean? It should be re-emphasized that as this equation is an identity (as long as factor shares are constant), it is compatible both with any state of competition and with any functional form for the production function, if, indeed, one actually exists. The main point of this argument is the obvious similarities between the identity equation (7.11) and the labour demand function equation (7.1), in particular the negative sign of $\ln w$. Our argument is that the negative sign of this variable in equation (7.1) is determined by the identity equation (7.11). Stated in different terms, the latter is no more than an approximation to the former.\(^{36}\)

We start the empirical analysis in section 7.4 with a discussion of minimum wages in the Philippines in the context of the estimation of the marginal revenue product curve. Then in section 7.5 we discuss the estimation of the labour demand function. It should be noted that there are two differences between equations (7.1) and (7.11). The first is that the identity (7.11) contains the constant price value of the stock of capital, while the labour demand function does not; the latter, on the other hand, contains a time trend that the former does not have. Secondly, equation (7.11) uses the profit rate ($\hat{r}$), which theoretically has a negative sign; while equation (7.1) uses the real user cost of capital ($\nu$), whose expected sign is positive. Section 7.5 discusses the implications of these two differences.

It must be stressed that the purpose of the next two sections is to support our theoretical arguments discussed above, which question both the usefulness and the conclusions of the neoclassical apparatus. To this purpose,
we start by corroborating that the identities yield the expected results in terms of size and sign of the coefficients; then we show how the results vary as the equations estimated deviate from the identities. In general, the sizes of the coefficients vary, but the signs remain.

7.4 Do minimum wages cause unemployment in the Philippines?37

For most economists, the idea of increasing the minimum wage is taboo. Raise the idea and one instantly gets tagged for being leftist. Mention the thought and everybody jumps on one for defying the law of supply and demand. Tinker with it and one supposedly endangers the health of the economy by increasing the rate of unemployment.

L. Dumiao38

Minimum wage setting is highly contested all over the world. Freeman argues that:

The minimum wage is a bête noire to distortions because it is the textbook case of an intervention that misallocates resources: an effective minimum wage reduces employment. The major question is whether the introduced increase is worth the job loss. If it does raise the wages of the most poverty-stricken at little cost to employment, many would find this an appealing way to redistribute income. If, by contrast, the cost is many jobs, and only a few highly paid formal sector workers benefit at the expense of lower-paid informal or rural sector workers, few would favour minimum wage policies.39

The theoretical effects of a minimum wage rate in a perfectly competitive market are very clear. In this model, by making labour more expensive, a minimum wage pushes firms up along their labour demand curve. This is because the minimum wage causes the firm to reduce labour usage as it will both substitute capital and other inputs for labour and cut back output. When labour markets are imperfectly competitive, however, the predictions are not so clear-cut, as, depending on the shifts of the supply and the marginal expense curves as a result of the implementation of a minimum wage, firms may even increase their profit-maximizing choice of labour input.

Using aggregate data, the profession has reached a consensus around the conclusion that minimum wages reduce employment.40 In a recent study of unemployment in the Philippines, Brooks concluded, despite acknowledging that the correlation between employment and the minimum wage was not a very robust finding, ‘that higher economic growth and moderate increases in the real minimum wage are required to reduce unemployment’.41

This conclusion was derived from the results of a regression with aggregate data of the logarithm of employment (ln L) on the logarithms of real GDP (ln Q) and the real minimum wage (ln w'), i.e.:

\[
\ln L_t = c + \delta_1 \ln Q_t + \delta_2 \ln w'_t + u_t
\]  
(7.12)

where \( u_t \) is the disturbance term. This expression is almost identical to the marginal revenue curve specification, discussed above, i.e. equation (7.2). Brooks’s regressions (Table 2 in his paper) show invariably that \( \delta_1 \) is positive and statistically significant, in most cases around unity.42 On the other hand, \( \delta_2 \) is negative (in some of the regressions it is not significant). In the two regressions where the variable was significant, it took the values of \(-0.55\) and \(-0.63\). The difference between this specification and the one in equation (7.2) is that while the former uses the minimum wage rate (\( w' \)), the latter uses the average wage rate (\( w \)). There are two problems with equation (7.12). First, its theoretical underpinnings are not clear, although in footnote 7 of the paper, Brooks indicates that this ‘approach assumes that the underlying technology is a CES production function’. Brooks seems to interpret the coefficient \( \delta_2 \) as that of the elasticity of demand for labour. However, as noted above, and assuming equation (7.12) has been derived from a CES production function, the elasticity of demand for labour is \( \eta_{L/Q} = -(1 - \alpha)\delta_2 \) (see equation 7.3).43

The second problem is that the policy conclusions Brooks derived from this type of work are problematic because there is no way in which he could have obtained different results, i.e. the regression specified above must yield a positive \( \delta_1 \) and a negative \( \delta_2 \) without implying any causality from the two right-hand-side variables to employment. In other words, no data set can reject statistically the relationship embedded in this regression. Hence, as a potentially refutable theory, it is of little use. Too see this, note that, by definition, one can write the identity for the labour share in output (\( \alpha_t \)) as \( \alpha_t = (w_t / L_t) / Q_t \), where \( w_t \) is the average wage rate. We use the symbol \( = \) to denote that this expression is an accounting identity, not a behavioural equation. This identity can be rewritten as \( L_t = \alpha_t (Q_t / w_t) \), which in logarithms can be written as:

\[
\ln L_t = c + \gamma_2 \ln Q_t + \gamma_3 \ln w_t
\]  
(7.13)

where \( c = \ln \alpha_t \), provided the labour share is constant. It is obvious that this regression must provide suspiciously good results, with \( \gamma_2 \cong 1, \gamma_3 \cong -1 \) and a very high statistical fit (potentially \( R^2 = 1 \)). It is an identity and hence it does not explain anything, except that, for some reason, factor shares are constant. The negative relationship between employment and wage rate is embedded in the identity. Using this framework, it is impossible to refute statistically the null hypothesis that employment and wage rate are negatively related.
Note that the econometric argument about the identity

$$\ln L_t = \gamma_1 \ln a_t + \gamma_2 \ln Q_t + \gamma_3 \ln w_t$$  \hspace{1cm} (7.14)$$

where \(\gamma_1 = 1\), \(\gamma_2 = 1\) and \(\gamma_3 = -1\), holds whether the labour share \((a_t)\) is constant or not. What the argument says is that if the labour share is perfectly constant, and thus it is well approximated by the constant term \(c\) in regression (7.13), then the identity explains parsimoniously the results in this regression. What if the labour share is not perfectly constant (as it is in real data)? The argument still applies. Suppose the labour share shows some slight variation. In this case, nothing changes for practical purposes. If, on the other hand, the variation from year to year is very large, it is true that results will deviate substantially from the identity. But this will simply indicate that the labour share varies too much to be approximated by a constant. Hence, one will need to approximate the labour share through a different form, for example, a trend if it is increasing. It does not imply, however, that employment, output and wages are statistically unrelated (that is, rejection of the labour demand curve) or that our argument does not apply. For all practical purposes, the variation from one year to the next displayed by the actual labour shares of most countries is not large enough to induce a severely large bias so as to turn the (theoretically) negative sign of the wage rate into a positive sign.

The difference between regression (7.13) and Brooks’s regression (7.12) is that he used the minimum wage rate \((w^*)\) instead of the average wage rate \((w)\). This is what induces in his results the deviation from the (perfect) results embedded in the labour share identity specification. However, the negative sign of the wage rate variable and the positive sign of output remain. This must be indeed the case. In the extreme, suppose the minimum wage rate is a constant fraction of the average wage rate. Then the two regressions (variables) are identical. But this is not the case in general, i.e., the minimum wage rate is not a constant fraction of the average wage rate. To see this, note that the labour share \(a_t = (w^* L_t)/Q_t\) can be written in terms of the minimum wage as \(a_t = \omega_t / \theta_t\). Hence, it follows that \(L_t = a_t Q_t / \omega_t / \theta_t\). And in logarithms, this identity becomes:

$$\ln L_t = \delta_0 \ln a_t + \delta_1 \ln Q_t + \delta_2 \ln w^* + \delta_3 \ln \theta_t$$  \hspace{1cm} (7.15)$$

where \(\delta_0 = 1\), \(\delta_1 = 1\), \(\delta_2 = -1\) and \(\delta_3 = -1\). This expression is parallel to equation (7.14), and it is the identity that serves as a reference point to understand equation (7.12). In practice, it is estimated with a constant term and without the variables \(\ln a_t\) and \(\ln \theta_t\), that is, \(\ln L_t = c + \delta_1 \ln Q_t + \delta_2 \ln w^* + \delta_3 \ln \theta_t\), in other words, equation (7.12).

In order to understand the results obtained in the estimation of equation (7.12), one must analyse the two variables \(a_t\) and \(\theta_t\) in equation (7.15). There are two cases: (i) \(a_t = a\) and \(\theta_t = \theta\). In this case, \(a\) and \(\theta\) become part of the constant term in the regression and estimation of equation (7.12) is identical to that of equation (7.15), the complete identity; (ii) \(a_t \neq a\) and \(\theta_t \neq \theta\). This is the general case. Regression (7.12) suffers now from a problem akin to that of omitted variable bias if \(a_t\) and \(\theta_t\) are correlated with the included regressors, output and minimum wage rate. As this is usually the case, the omission of these two variables will induce a bias in the coefficients of the estimated regression, that is, in \(\delta_1\) and \(\delta_2\).

The conclusion is that if Brooks ran his regression to “test” a behavioural model, the problem is that such a regression will not be able to reject the alleged model: the signs of the two variables are a forgone conclusion and the magnitudes of the coefficients will be relatively close to what the identity predicts. The conclusion is that this type of empirical analysis has no policy implications whatsoever.44

Table 7.1 shows the results of the estimation of equations (7.12) as well as the identities (7.13)–(7.14) and (7.15).

The most salient results of this exercise are as follows:

(i) Regression (a) is the full accounting identity, equation (7.14). All this regression does is to confirm that the data set is consistent in the sense

\begin{table}
\centering
\caption{Marginal revenue product of labour function, the minimum wage rate and the accounting identity, the Philippines, 1980–2003}
\begin{tabular}{|c|c|c|c|c|c|}
\hline
\textbf{Average wage rate} & & & & & \\
\hline
\textbf{ln} & $a_t$ & $c$ & $\ln Q_t$ & $\ln w_t$ & $R^2, DW$ \\
\hline
(a) & 1.00 & 1.00 & -1.00 & & 1.00, 0 \\
(b) & -4.78 & 0.82 & -0.68 & -1.20 & 0.99, 1.47 \\
(c) & -4.60 & 0.81 & -0.65 & -10.61 & 0.99, 1.50 \\
\hline
\textbf{Minimum wage rate} & & & & & \\
\hline
\textbf{ln} & $a_t$ & $c$ & $\ln Q_t$ & $\ln w^*_t$ & $\ln \theta_t$ & $R^2, DW$ \\
\hline
(d) & 1.00 & 1.00 & 1.00 & 1.00 & 1.00, 0 \\
(e) & -12.74 & 1.15 & -0.50 & -7.64 & -13.13 & 0.90, 0.59 \\
(f) & -9.51 & 1.03 & -0.64 & -1.81 & -3.82 & -1.36 & 0.98, 2.44 \\
\hline
\end{tabular}
\end{table}
that it satisfies the said identity. Certainly this regression has no other implications whatsoever.

(ii) Regressions (b) and (c) can be interpreted in two different ways. First, as the identity estimated in regression (a) assuming that the labour share is a constant, i.e. equation (7.13). The second interpretation is in terms of the marginal revenue product of labour function, equation (7.2). Regression (b) is the static equation and regression (c) is estimated including the lagged dependent variable. Under the first interpretation, the different estimates obtained in regressions (a) and (b) are the result of, as noted above, what could be attributed to omitted variable bias, as the labour share $a_t$ is subsumed into the constant term in regression (b). The results are very good econometrically, despite the fact that the labour share is clearly not constant, as shown in Figure 7.1. The important aspects to note are the negative sign of the average wage rate, and the positive sign of output, both variables with values that would be interpreted as plausibly (also note the extremely high t-statistics). Under this interpretation, as argued above, regression (b) is simply an accounting identity with no behavioural content. Under the second interpretation, the elasticity of employment with respect to the wage rate must be derived from the constant term, i.e. $c = \ln \alpha$ (see equation (7.2)), which in this case implies an elasticity of demand for labour of $\eta_{l/a} = -[1 - \exp(\hat{c})] = -0.99$ (t-statistic of -278.32).

(iii) Regression (d) is the full accounting identity with the minimum wage rate, equation (7.15). Figure 7.2 shows both the real average and minimum wage rates for the Philippines for 1980–2003. And Figure 7.3 shows $\theta_t$, the ratio between both variables. All this regression does is confirm that the data set is consistent in the sense that it satisfies the said identity.

(iv) Regression (e) is the equation Brooks estimated, equation (7.12). Given our arguments, we know that the coefficients of this regression suffer from two types of omitted-variable bias, namely the omissions of the labour share $(a_t)$ and of the relationship between minimum and average wage rates $(\theta_t)$. Both variables are subsumed into the constant term. Despite this, results are very good, as the positive sign of output, with a value around one, remains. The negative sign of the minimum wage rate also remains, with a value of $-0.50$, similar to what Brooks obtained. As argued above, this estimate cannot be interpreted as an estimate of the elasticity of demand for labour. The latter, interpreted now as the elasticity with respect to the minimum wage rate, is given by $\eta_{l/a} = -[1 - \exp(\hat{c})] = -1.00$ (t-statistic of -205,181.1).

(v) The major objection to regression (e) is that it is most likely spurious (see the low Durbin–Watson statistic). Hence we re-estimated it introducing the dependent variable lagged one period (regression (f)). The conclusions remain unchanged. In this case, the elasticity of the demand for labour with respect to the minimum wage rate is $\hat{\eta}_{l/a} = -[1 - \exp(\hat{c})] = -0.70$ (t-statistic of -2.07).

Summing up, this section has shown that the conclusions derived by Brooks about the impact of minimum wages in the Philippines are not
the regression mimics the accounting identity rather well. The average labour share \(\bar{\alpha}\) for the period in our data set is 0.68, with a standard deviation of 0.044. The theoretical estimate (equation (7.11)) of the coefficient of output \(\bar{\beta}\) is, therefore, \((1/\bar{\alpha}) = (1/0.68) = 1.47\); the theoretical estimate of the wage rate \(\bar{\omega}\) is \(-1\); and the theoretical estimate of both the profit rate \(\bar{\rho}\) and the capital stock \(\bar{K}\) is \(-1/(1-\bar{\alpha}) = -0.47\). Given the estimates of equation (a) all we can legitimately conclude from this regression is that indeed equation (7.11) is a very good approximation to the identity equation (7.7).

(ii) Since regression (a) displays a very low Durbin–Watson statistic together with very high t-statistics, the conclusion that some sceptics may draw is that the good fit of regression (a) may be spurious. To show that this is not the case and that, indeed, these results are driven by the fact that what is being estimated is an identity, the regression was run with all five variables expressed in growth rates. The results are displayed in panel (b). The similarity of the two sets of estimates can only be the result of the fact that what is being estimated is an accounting identity.

(iii) Regression (c) is the neoclassical labour demand function, given by equation (7.1). The signs are the expected ones. The estimates, though slightly different from the theoretical ones in equation (7.1), are nevertheless plausible. Overall, these results would be accepted by most researchers as representing the Philippine labour demand curve. The elasticity of demand for labour is given by the estimate of the coefficient of \(\ln w\). The results indicate that a 1 per cent increase in the wage rate leads to a \(-0.53\) per cent decline in employment.\

(iv) As noted at the end of section 7.3, there are two differences between the labour demand function, regression (7.1), estimated in equation (c), and the accounting identity, regression (7.11), estimated in equation (a). The first one is that is that the labour demand function includes a time trend \(t\) while the accounting identity includes the stock of capital \(K\). The second difference is that equation (7.1) uses the rental price of capital \(\nu\), which has a positive sign, while the identity (7.11) uses the profit rate \(\rho\), which has a negative sign. In what follows we discuss and reconcile the effect of these two issues.

The inclusion of the time trend as opposed to the stock of capital is the lesser of the two problems. Regression (d) in Table 7.2 reports the estimation of the accounting identity by replacing the stock of capital with the time trend, that is,

\[
\ln L_t = c + (1/\alpha) \ln Q_t - 1.0 \ln w_t - [(1 - \alpha)/\alpha] \ln \rho_t - \lambda t
\]

which looks very much like the labour demand function, equation (7.1), except for the sign of the coefficient of the profit rate. The results are, not
surprisingly, very good and similar to those in regression (a) in Table 7.2. This is because the constant price value of the stock of capital is calculated through the perpetual inventory method. Hence, it is a smooth function of time. Consequently, when it is replaced into the identity with the linear time trend, the latter provides a good proxy and works well.

This result leads to the conclusion that the different values obtained in the estimation of the neoclassical labour demand function and the accounting identity are mostly due to the difference between the real profit rate (r) and the real user cost of capital (v). Here there are two related questions to consider. The first one is the difference in the signs of ln v (positive) in equation (7.1) and of ln r (negative) in equation (7.11). The second issue concerns the relationship between the real profit rate (r) and the real user cost of capital (v).

With respect to the first question, it can be shown that this is just a result of the way the two specifications are expressed and that, in fact, both equations are identical. To see this, assume for simplicity that \( r = v \), then note that equation (7.1) can be rewritten as \( \ln L = c - \ln w + \ln Q \).

This is because, under neoclassical assumptions, \( \lambda_r \) the rate of technical progress, is equal to \( \alpha w + (1 - \alpha) b \), which means that \( \lambda = \alpha w + (1 - \alpha) \ln v \).

The capital share \( 1 - \alpha = (rK/Q) \) can be written as \( \ln Q = \ln \frac{1}{1 - \alpha} \ln r + \ln \frac{1}{1 - \alpha} \ln K \).

Substituting the latter into the expression for \( \ln L \) yields \( \ln L = c - \ln w + \ln r + \ln \frac{1}{1 - \alpha} \ln K \), and noting that \( \frac{1}{1 - \alpha} \ln Q = \frac{1}{1 - \alpha} \ln r + \ln K \), then \( \ln L = c - \ln w + (1/\alpha) \ln Q - [(1 - \alpha)/\alpha] \ln r - [(1 - \alpha)/\alpha] \ln K \), which is, not surprisingly, the identity (7.11). The conclusion is that both specifications can be reconciled with each other and our argument is correct.

In order to see the effect of the second question, namely the fact that the two series used are different, we have plotted them in Figure 7.4.

While the profit rate is definitionally the ratio of total (residual) profits (\( \Pi \)) in the National Accounts to the stock of capital (\( K \)), i.e. \( r_t = \frac{\Pi_t}{K_t} \), and it is, in general, a pro-cyclical variable, the user cost of capital is calculated following Jorgenson as \( v_t = \frac{[q_t(\delta - q_t)]}{P_t} \), where \( q_t \) is the price of the capital goods, \( \delta \) is the nominal interest rate, \( q_t \) is the capital gain-loss, and \( P_t \) is the GDP deflator\(^5\) and \( v_t \) is a countercyclical variable. In general, one should expect \( v_t = \frac{q_t(\delta - q_t)}{P_t} \neq \frac{q_t}{P_t} = r_t \). How are the two variables related? The ex post profit rate (\( r \)) is the sum of the user cost of capital (\( v \)) plus another return on monopolistic profits (\( v \)), that is, \( r = v + \nu \). This is because the identity (7.7) can be written as \( Q = wL + vK + \nu K = wL + (v + \nu)K = wL + rK \), where \( \nu \) is the return on monopolistic profits.

In these circumstances, the closer \( r \) and \( v \) are to each other, the more estimation results of the neoclassical labour demand function will resemble those of the income accounting identity; and the more these two variables differ (due to the different cyclicality) the more the results will differ. In the case of the Philippines, the correlation coefficient between the two variables is \(-0.61\).

### 7.6 Do increases in the minimum wage rate induce increases in the average wage rate in the Philippines?

The conclusion to be drawn from the previous sections is that the estimation of the labour demand function with a view to assessing the impact of wage rate (or of the minimum wage rate) increases on employment is a futile exercise. This does not mean that we cannot know anything about the impact of increases in the minimum wage rate on some other macroeconomic variables. In this section, we follow Rama’s approach to assess the impact of increases in the minimum wage rate on the average wage rate.\(^5\) As the approach uses a reduced form equation and is not trouble-free, some degree of caution must be exercised in drawing conclusions. The regression we estimate to analyse the impact of the minimum wage rate on the average wages rate is the same as Rama’s but including lags, that is,

\[
\hat{w}_t = \alpha_1 + \sum_{l=1}^{L} b_l \hat{w}_{t-l} + \sum_{j=0}^{J} c_j \hat{w}_{t-j} + \sum_{k=0}^{K} d_k \Delta Z_{t-k} + \epsilon_D 84 + u_t \tag{7.17}
\]

where \( \hat{w} \) denotes the growth rate of the average real wage rate; \( \hat{w}^* \) is the growth rate of the real minimum wage rate; \( \Delta Z \) is a series of control variables, or determinants of the growth of the average wage rate; \( D84 \) is a dummy variables with value 1 for 1984 and 0 for the rest. This variable reflects the fact that the average real wage rate fell by 17 per cent in 1984. As the regression excluding the dummy variable does not pick up the influence of this year well, the inclusion of the dummy variable greatly helped to improve the goodness-of-fit of the estimated regressions. Finally, \( u_t \) is the disturbance term.\(^5\) We used five control variables: the growth of real GDP, the growth of labour productivity, the growth of inflation, the growth rate of the share of employment in the industrial sector in total employment and the growth rate
7.7 Conclusions

Constant returns to the need to be competitive in order to survive in the global economy have put a tremendous burden on workers. This is because the main mechanism advocated to increase competitiveness is the reduction of labour costs. Indeed, in mainstream models, increases in real wages cause employment to decline as higher wages induce firms to substitute other inputs for labour, and as a result of the fact that higher wages entail cost increases, which induce buyers to shift suppliers. These arguments underlie the rationale for the neoclassical labour demand curve, i.e., the inverse relationship between employment and the wage rate, and calls for labour market reform in order to make it more flexible. This is the crux of the solution to the unemployment problem in mainstream analyses.

This chapter has argued that, contrary to what many economists believe, the theoretical foundations of the labour demand function are very shaky. The standard finding that there is a negative relationship between the level of employment and the wage rate underlies the neoclassical thesis that higher wages lead to lower employment and orthodox proposals for labour market reforms. It has been shown that this observed negative relationship is determined by the income accounting identity that relates the value of output to the wage bill plus profits. This accounting identity can be rewritten as a form that resembles the neoclassical labour demand function such that, when estimated econometrically, it yields the observed negative relationship between these two variables. As with all tautologies, this finding is consistent with any underlying structure and as such explains nothing; and as consequence, it carries no policy implications whatsoever. One important implication of our argument is that labour market reforms, with a view to making labour markets more flexible, advocated on the basis of this erroneous empirical evidence, should be viewed with caution.

The theoretical arguments have been corroborated with data for the Philippines, a developing country. It has been shown that claims about the need to contain minimum wages in this country based on analyses derived from neoclassical labour demand functions are not compelling. The empirical exercise has shown, step by step, why regressions of employment on the wage rate will indicate that there exists a negative relationship between both variables, although this result has no causal implications whatsoever. Hence, we remain sceptical about the standard interpretation of a negative elasticity of demand for aggregate labour and about the implication that higher labour costs have a negative impact on employment. For this reason, we disagree with Hamermesh's advice to policy-makers, 'that in developing economies, as in developed ones, polices that may be socially desirable, but that raise labour costs or increase labour market rigidity, have negative consequences for the level of employment'. Clearly, the negative impact of wage increases has been based on fallacious empirical evidence.

Naturally, this disagreement does not mean that we believe an increase in the average or in the minimum wage rates does not lead to a decrease in employment. This might be true, as Keynes remarked. Our claim is simply that the empirical evidence often presented and derived from the estimation of neoclassical labour demand functions is not persuasive. On the other hand, it is not difficult to think of the potential positive effects of an increase in the minimum wage rate via an increase in the overall wage bill and, hence, in demand through the multiplier effect. This can lead to more jobs. Claims
that increases in the minimum wage rate lead to decreases in investment and to an increase in the inflation rate have to be verified empirically.56

Annex 7.1 The NAIRU and the laws of algebra

Lavoie57 has shown that a variant of a NAIRU model by Layard et al. (hereafter LNJ)58 can be derived easily as a series of simple transformations of the variables that define the income side of the National Income and Product Accounts (NIPA). Hence, its econometric estimation has no policy implications whatsoever.59

LNJ argued that their model allowed them to explain the path of the rate of equilibrium unemployment, or NAIRU. They argued that 60 per cent of the increase in unemployment in France was due to increases in real interest rates and the rest was due to increases in the social security payments and other benefits.

The results seem to be very persuasive because the path of the equilibrium unemployment rate seems to match the evolution of observed unemployment. Lavoie (2000) argues that there seem to be a number of studies on the NAIRU highlighting the role of tax rates, as opposed to other traditional variables, such as the rate of unionization or the different measures of the costs of severance payment or of the generosity of social programmes. The model estimated consists of the following three equations:

\[
\ln w = a_1 U + a_2 \ln \text{wedge} + \gamma t \quad (7.1A)
\]

\[
\ln w = b_1 U + b_2 (\ln Q - \ln N) + b_3 t \quad (7.2A)
\]

\[
\ln w = \gamma t - \frac{(1-a)}{a} \ln i \quad (7.3A)
\]

where (7.1A) is a behavioural equation that defines workers' target salary. In it w is the real wage rate, U is the rate of unemployment, wedge is the tax wedge, that is, the difference between workers' take-home pay and the costs of employing them, including income taxes and social security contributions; and t is a time trend. Equation (7.2A) represents the short-term labour demand curve. Here Q denotes real output and N is the level of active population. Finally, equation (7.3A) represents the long-term labour demand curve. i denotes the real interest rate. The coefficient γ represents the labour productivity gain, and (1−a)/a is the ratio of the capital share to the labour share in output.

The intersection of equations (7.1A) and (7.2A) determines the mid-term equilibrium unemployment rate; while the intersection of equations (7.1A) and (7.3A) determines the long-term equilibrium unemployment rate, which in LNJ's model depends only on the tax wedge wedge, and on the real interest rate (plus a constant). These two relationships allow the authors to assert that the high long-term equilibrium unemployment rate is mainly due to the high real interest rates and due also partially to the high social security payments and other benefits.

The authors argue that theory implies that b_1 = b_2 = 1 in equation (7.2A). The only econometric result from this equation is b_3 = -0.002 (with quarterly data). The authors verify that a_1 < 0 and a_2 > 0 and around unity in equation (7.1A). This means that when the unemployment rate decreases, workers negotiate real salaries above what would be justifiable given the increments in productivity and also that increases in social security taxes and other benefits lead to increases in negotiated real salaries.

According to LNJ, equation (7.2A) indicates that for a given increase in full employment productivity, an increase in the real salary entails an increase in the unemployment rate, as a result of the maximization behaviour of firms.

However, Lavoie has argued that these equations can be easily derived from the income side of the NIPA, and thus that their econometric estimation does not imply anything in terms of testing a theory and policy implications. The NIPA allows the derivation of equations (7.2A) and (7.3A) in a few steps. Start from the definition of output (Q) as the sum of the total wage bill, itself the product of the average wage rate (w) and the level of employment (L); and total profits, the product of the profit rate (r) times the stock of capital (K):

\[
Q = wL + rK \quad (7.4A)
\]

In growth rates it becomes:

\[
\dot{Q} = a \dot{w} + (1-a) \dot{r} + a \dot{L} + (1-a) \dot{K} \quad (7.5A)
\]

where a and (1−a) denote the labour and capital shares in output, respectively. Now rewrite it as:

\[
\dot{w} = \frac{(1-a)}{a} (\dot{Q} - \dot{K}) = \frac{(1-a)}{a} \frac{(1-a)}{a} \dot{L} \quad (7.6A)
\]

Note that \(a + \frac{1-a}{L} = \frac{N-L}{L} = 1 \Rightarrow (1+U) = \frac{N}{L} \). Recall the approximation \( \ln(1+U) \equiv U \approx \ln(1+U) = \frac{U}{L} \). Therefore, \( U \approx \ln \left( \frac{U}{L} \right) \equiv \ln (N) - \ln (L) \).

Taking the derivative with respect to time, the last expression becomes \( \dot{U} \equiv \frac{N-L}{L} \Rightarrow \dot{L} = \dot{N} - U \). Substituting this expression for \( \dot{L} \) into (7.6A) yields:

\[
\dot{w} \approx (\dot{Q} - \dot{N}) + \dot{U} + \frac{a}{(1-a)} (\dot{Q} - \dot{K} - \dot{r}) \quad (7.7A)
\]
Integrating yields:

\[
\ln w = (\ln Q - \ln N) + U + \left(1 - \frac{a}{a}\right) \Delta t
\]  
(7.8)

where \( h = \left(\hat{Q} - \hat{R} - \hat{r}\right) \). It is obvious that expressions (7.8) and (7.2) are the same for all practical purposes. No wonder econometric estimations lead to \( b_1 = b_2 = 1 \) and no wonder either that economists have succeeded at verifying empirically, based on equations like (7.2) or (7.8), that excessive increases in real salaries lead to increases in the unemployment rate. However, since this result is derived from an accounting identity, it does not have such an interpretation.

Let us now derive equation (7.3). Returning to (7.6), note that it can be written as:

\[
\hat{w} = \frac{1}{a} \left(\hat{Q} - (a\hat{L} + (1 - a)\hat{K}) - \frac{1 - a}{a} \hat{r}\right)
\]  
(7.9)

or,

\[
\hat{w} = \frac{\lambda}{a} - \frac{1 - a}{a} \hat{r}
\]  
(7.10)

where \( \lambda = \hat{Q} - [a\hat{L} + (1 - a)\hat{K}] \). Integrating yields:

\[
\ln w = \frac{\lambda}{a} - \frac{1 - a}{a} \ln r
\]  
(7.11)

which can be approximated as:

\[
\ln w = \gamma t - \frac{1 - a}{a} \ln i
\]  
(7.12)

where \( \gamma = \lambda/a \) and is the \( i \) interest rate. It can be seen that equations (7.12) and (7.3) are the same. But again, since (7.12) is an accounting identity, its estimation does not have any economic implications.

Finally, Lavoie argues that the only behavioural equation in the system is (7.11), even though he argues that the results are not convincing, but for reasons unrelated to those summarized above.\(^6\)

**Notes**

1. We are grateful to the participants in the seminar on ‘Labour Market Institutions and Employment in Developing Countries’, organized by the International Labour Office, Geneva, Switzerland, 24–5 November 2005, for their comments. Janine Berg and David Kucera provided us with very valuable suggestions that greatly improved the manuscript. Any remaining errors are ours. This chapter represents the views of the authors and does not represent those of the Asian Development Bank, its Executive Directors, or the countries that they represent.


6. On this see H. Botwinick (1993) *Persistent Inequalities: Wage Disparity under Capitalist Competition* (Princeton, NJ: Princeton University Press) and D. Rodrik (1999) ‘Globalization and Labour, or: If Globalization is a Bowl of Cherries, Why Are There So Many Glum Faces around the Table?’, in R. Baldwin, D. Cohen, A. Sapir and A. Venables (eds), *Market Integration, Regionalism and the Global Economy* (New York: Cambridge University Press). The former offers an analysis of wage inequalities from a Marxian perspective, while the latter discusses the impact of globalization on labour, in particular: (i) how globalization affects unskilled labour as it becomes more substitutable; (ii) how labour standards (e.g., compliance with ILO standards) affect labour costs, comparative advantage and foreign direct investment; and (iii) the role of national governments in developed countries in sheltering domestic society from external risks.


9. Ibid., p. 261. Furthermore, see Chapter 19, in particular where Keynes argued that the classical argument that a reduction in money wages will stimulate demand by diminishing the price of the finished product is a fallacy. In particular, in the context of a closed economy, Keynes argued that while a reduction in money wages could indeed stimulate output, the reason for this result is not that of classical theory, that is, that a reduction in the wage rate would reduce the price of the finished product, and thus increase output and employment. Keynes argued that this line of reasoning necessarily assumed that aggregate effective demand is fixed. In his own words, ‘the precise question at issue is whether the reduction in money-wages will or will not be accompanied by the same aggregate effective demand as before measured in money, or, at any rate, by an aggregate effective demand wish is not reduced in full proportion to the reduction in money-wages (i.e., which is somewhat greater measured in wage-units)’ (ibid., p. 259). His key objection was that while the classical analysis might be possible for an individual product, it need not be true for the industry as a whole. It would be correct only under the assumption that aggregate demand is fixed (Keynes 1936, p. 259). S. Keen (2001) *Debunking Economics* (London: Pluto Press), Chapter 5, offers an accessible critique of the mainstream conceptualization of the labour market.


13 Hamermesh (2004), p. 92. G. J. Borjas (2005) *Labor Economics* (New York: Irwin McGraw-Hill), p. 114, notes that there are criticisms of the minimal productivity theory of labour, but dismisses them. Some critics argue that the theory bears little relationship to the way that employers actually make hiring decisions. He dismisses it by arguing that if some employers did not behave the way that marginal productivity theory says they should behave, those employers would not last long in the marketplace. He also indicates that the value of this theory does not necessarily depend on the validity of the assumptions – or on whether it provides a ‘realistic’ depiction of the labour market. He argues that surely employers do not have any idea of what this theory says, but it must be true that employers in a competitive labour market must act as they know and obey the implications of this theory. In other words, the theory is fallible and the mere thought of it being refuted empirically seems to be something out of question.


19 Ibid., p. 40.


22 M. Cárdenas and R. Bernal (2004) ‘Determinants of Labor Demand in Colombia 1976–1996’, in Heckman and Pagés (eds), *Law and Employment: Lessons from Latin American and the Caribbean* (Chicago: The University of Chicago Press), tables 4.7–4.8, pp. 264–5. With firm-level data, they find a short-run wage elasticity of −0.05 and a long-run elasticity of −2.27. With panel data, the estimated short-run real wage elasticity is −0.6 and the long run is −1.43. Some Keynesians, while accepting the marginal productivity theory of factor pricing, would dispute this line of reasoning. They argue that while there is an inverse relationship between the wage rate and the level of employment (because of diminishing returns), the causation is not that of the neoclassicals. It is the level of demand that determines the demand for labour which in turn determines the real wage (e.g. A. P. Thirlwall (1993) ‘The Renaissance of Keynesian Economics’, *Banca Nazionale del Lavoro Quarterly Review*, 186). We shall not pursue this argument here.

23 T. Besley and R. Burgess (2004) ‘Can Labor Relations Hinder Economic Performance? Evidence from India’, *Quarterly Journal of Economics* (February), 91–134 is another well-known work for developing countries. These authors exploit state-level amendments to India’s Industrial Disputes Act over the period 1958–92, and code legislative changes across major states as either pro-worker, neutral, or pro-employer. These legislative amendments are then used in a regression analysis of a variety of outcomes in the formal manufacturing sector, including employment and investment. Consistent with expectations of reformers, Besley and Burgess find that pro-worker labour regulations have had a negative impact on employment, output and investment in formal manufacturing. Felipe and Hasen (eds) (2006), chapter 5, review this work and indicate that there might be some potential problems with the Besley and Burgess work. For example, reading off directly from legal statutes to measure rigidities could be highly misleading. Also, their coding of various states legislation seems to be puzzling. Felipe and Hasen also point out that Besley and Burgess’s results indicate that pro-worker legislative amendments are not found to raise workers’ wages. This is certainly puzzling.


29 The so-called Cambridge Capital Theory Controversies took place between the 1950s and the 1970s. At stake was the question of the meaning of an aggregate stock of capital, especially for purposes of including it as a ‘factor of production’ in an aggregate production function. There are two related problems: (i) the first one is that the only way to express an aggregate stock of capital is in monetary terms. This is a problem because the production function is supposed to be a relationship among physical quantities; (ii) the second one is that there is a problem of circularity. So long as the capital stock is a collection of heterogeneous capitals (as it happens at the aggregate level), its measurement requires knowledge of the relative values of individual capital goods. This can only be achieved if the price vector


It is worth noting that if we were to estimate this identity, assuming a relatively constant labour share of about 0.75, we should expect the estimates to be about

\[ L = c + 1.33 \ln Q - 1.01 \ln w - 0.33 \ln r - 0.33 \ln K \]

a perfect fit. Certainly there is no reason to estimate this regression for its results are known *a priori*.


30 See F.M. Fisher (1993) *Aggregation: Aggregate Production Functions and Related Topics* (London: Harvester Wheatshead); J. Felipe and F.M. Fisher (2003) ‘Aggregation in Production Functions: What Applied Economists Should Know’, *Metroeconomica*, 54(2–3). The aggregation problem refers to the search for the conditions under which macro aggregates (not only capital) exist. The question posed is as follows: what are the conditions under which micro production functions (with neoclassical properties) can be aggregated so as to yield an aggregate production function (also with neoclassical properties)?

31 Theoretically, one should be able to measure essential quantities in the production function. However, these do not exist at the aggregate level. Hence, constant-price values have to be used instead.

32 In practice, the mark-up will be on average direct costs (i.e. including the cost of materials). However, this does not affect the argument. Also, in practice, it is likely that mark-ups will vary to the degree that the composition of firms with differing mark-ups alter and there are changes in the individual mark-ups, which may be temporary, as a result of the wage-bargaining process. Solow (1958) has shown that aggregation may well decrease the variability of the aggregate factor shares compared with the shares of the individual firms/industries. R. Solow (1958), ‘A Skeptical Note on the Constancy of Relative Shares’, *American Economic Review*, 618–31. On price theory see Lee (1999) for a detailed discussion. F. Lee (1999) *Post Keynesian Price Theory* (Cambridge: Cambridge University Press).

33 It should be noted that *v*, the user cost of capital, differs from *r*, the ex post profit rate. This does not affect the argument and is discussed below.

34 It could be argued that the argument depends on the constancy of the factor shares and that, therefore, it implies a Cobb–Douglas production function. This argument is invalid. We have already noted that the literature on aggregation proved that aggregate production functions cannot be derived theoretically (see Fisher 1971); hence the labour demand function cannot be derived. The constancy of the factor shares could be the result of firms applying a constant markup on unit labour costs, regardless of the form of the firms’ individual production
R. Brooks (2002) "Why is Unemployment High in the Philippines?", IMF Working Paper 02/23 (Washington, DC: IMF), p. 21. It should be noted that we have italicized moderate increases in this quotation. This is because we believe the statement is somewhat inconsistent with the empirical evidence Brooks found. As he found that the minimum wage rate is inversely related to the employment level, the correct policy implication would be to recommend a decrease in the minimum wage rate, presumably to the market-clearing level. We believe that Brooks was trying to make a more politically acceptable statement. We are grateful to Janine Berg for bringing this issue to our attention. On the other hand, the argument could be that with a higher rate of output growth, a slower growth (rather than a decrease) of the minimum wage rate would lead to increased employment, under no other assumptions.

Brooks estimated four regressions for different periods and using the GDP deflator and the consumer price index (CPI).

Brooks does not report the constant term.

G. Fields (2004) 'A Guideline to Multisector Labor Market Models', paper prepared for the World Bank Labor Market Conference, Washington DC, 18-19 November. Manuscript, p. 10 argues that the basic neoclassical model is often misused. He argues: 'One common misconception is that the wage "should" vary with labor productivity, commonly measured as value added per worker. Nothing could be further from the truth.' This is because the model's prediction is a relationship between the real wage rate and marginal productivity. However, Fields is not entirely correct on two grounds. First, what most economists do is to assume a Cobb-Douglas production function. In this case, the marginal productivity is equal to the average product of labour times the elasticity of output with respect to labour. The assumption of the Cobb-Douglas might be questionable, but once it is made, then it is true that the marginal product of labour is directly related to the average product. The doubt here is whether the statement that the wage rate should vary with labour productivity is a normative or a positive one. The second argument why Fields' statement is not entirely correct is that, in general, wage rates and labour productivity do move together. But this is true simply due to the labour share identity, which can be rewritten as \( w_t = a_t(Q_t/L_t) \). Since the labour share does not vary that much, any regression of the wage rate on the average product of labour will work. Unfortunately, many economists take this as evidence of the marginal theory of factor pricing because a similar relationship follows by assuming a Cobb-Douglas production function, which, as argued above, is what many economists do. (It works!)

The Philippines does not have a unique minimum wage rate. The Regional Tripartite Wage and Productivity Boards (RTWBP) and the National Wages and Productivity Commission set different minimum wage rates for 16 regions. These are daily wage rates. We converted the one for the National Capital Region (the highest) into an annual wage by assuming 300 days of work per year. Then this annual nominal wage rate was deflated using the GDP deflator.

Regarding Figure 7.2, Felipe and Lanzona (2006) argue that the data indicate that the average real annual minimum wage caught up with the average real wage rate in 1989. This suggests two things. First, that a significant number of employers have violated the minimum wage law. If the legally imposed minimum wage rate had been followed strictly, the average wage rate should have been higher. Secondly, the late 1980s saw the formation of new tripartite institutions that paved the way for the greater enfrenchisement of both employer and employer groups in the determination of minimum wages. The formation of tripartite channels of cooperation subsequently insured that minimum wages would not conflict with economic and industrial policies and programmes in response to the requirements of economic restructuring. The equal consideration of labour and management interests meant that minimum wages follow the general trend of average market wages.

The reader could still argue that in modern time series econometrics this would not be the correct way to solve the problem of spuriousness. For example, an error correction model would be more appropriate. Felipe and McCombie (2007) discuss the issue and show that the argument is not affected.

Equation (7.1) indicates that the sign of the time trend should be negative. We do not have an explanation for why we obtain a positive sign. This finding does not undermine our arguments.


M. Rama (2001) 'The Consequences of Doubling the Minimum Wage: The Case of Indonesia', Industrial and Labor Relations Review, 54(4). Rama also estimates the impact of the minimum wage rate on employment. However, we believe that the regression he estimates is subject to the critique advanced in previous sections.

Rama's (2001) starting regression is in levels and since it is estimated pooling time-series and cross-sectional data, it includes province and year-specific effects. In our case, we have pure time-series data. We will not discuss here the econometric details. Suffice to say that we tested the series for unit roots and for cointegration and estimated the equations in error-correction form. We settled for the simple specification in growth rates as it yielded the best results.

Ibid.


Keynes (1936), chapter 19.


Lavoie (2000).

Layard et al. (1991).

All references to this work should cite Lavoie (2000).

Ibid.