The Demand for Labour: A Post Keynesian Appraisal

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Abstract

This paper is concerned with ambiguities in the Post Keynesian model regarding the nature of the functions involved in the determination of the demand for labour. Those ambiguities have led to misleading representations of Keynes's theories regarding the demand for labour and to conceptually travesty effective demand schedules. These controversial concepts will be analysed in reference to Keynes' original reflections. Furthermore, this paper offers a different analysis from those of Allain (2009), Hartwig (2011), Hayes (2013), Lavoie (1992) and Chick (1983), but also from the Weintraub (1956) and Davidson's (1994) Z and AD theoretical framework.

Key-words

Post Keynesian Economics, demand for labour, aggregate supply and demand, effective demand.

JEL Classification: E12

Contents: 1. Introduction. 2. Aggregate Supply. 3. Aggregate Demand. 4. The Demand for Labour. 5. Conclusion

1. Introduction

As we shall see, in Post Keynesian theory (with and without the hyphen) there are contradictory interpretations of Keynes's demand for labour. This paper analyses different interpretations of the Aggregate Supply Curve (Z) and the Aggregate Demand Curve (AD)[1] comparing them with Keynes' original work.

Keynes did not assume that the demand for labour curve corresponded to the marginal product curve[2]. Instead, he calculated the demand for labour from the intersection of the Aggregate Supply Curve and the Aggregate Demand Curve, which are explained in sections 2 and 3 respectively. Keynes accepted the validity of the first Classical Postulate which, in addition to the assumption of decreasing marginal returns, leads to the conclusion that lower real wages are positively correlated with higher employment. Hence, the paradox of costs vanishes in real terms, and if we further assume that nominal wages move in the same direction as real wages, it will also vanish in nominal terms.

Furthermore, Keynes never assumed that expectational shocks were the cause of unemployment because "the theory of effective demand is substantially the same if we assume that short period expectations are always fulfilled" (Keynes 1973: 181). In disequilibrium, firms might be off their optimum curves as they are constrained in the commodity market and prices might not be profit maximising. Additionally, expected prices might also be different from current ones. Hence, the price level embedded in Z does not have to be the same as the one embedded in AD as Weintraub suggests. Furthermore, for Keynes, aggregate expenditure and aggregate demand represented the same variable and equal to current expenditure when expectations are fulfilled. It is also shown that, contrary to Allain, Hartwig and Hayes' interpretations, Z and AD do not have to be in continuous equilibrium.

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[1] "The economic system may find itself in stable equilibrium with N at a level below full employment, namely at the level given by the intersection of the aggregate demand function with the aggregate supply function" (Keynes, 1936: ch. 3).

[2] See Paul Davidson (1983).

In section 4 the demand for labour curve will be calculated from the intersection of the AD and Z curves. The effective demand schedule (EDS) is then an equilibrium curve where prices and employment have adjusted to their equilibrium levels.

2. Aggregate Supply

The Aggregate Supply price of the output of a given amount of employment is the expectation of proceeds which will just make it worth the while of the entrepreneurs to give that employment (Keynes 1936: ch. 3).

The Post Keynesian Aggregate Supply theory has stressed the role of firms' expectations in the formulation of the Z-function[3]. However, Hartwig (2009, 2011) has criticised this Post Keynesian feature by assuming that "Contrary to the Post Keynesian interpretation outlined above, there is no element of uncertainty – or expectation-building – involved as long as the entrepreneur is certain about his cost conditions" (Hartwig 2009: 730). Hartwig has also asserted that Allain's (2009) paper is a better approximation to Keynes than the interpretations of Palacio-Vera, Davidson or Weintraub.

For Keynes the problem of profit maximisation for an individual firm (i) would be as follows[4]:

$$(2.1) \ \pi_i = p_i^s \ q_i^s(N_i^s) - w \ N_i^s - U_i^e$$

An individual firm will choose a price that maximises its profits at a given expected level of sales. The maximization of this function leads to:

$$(2.2) \ p_i^s = \frac{w \ + \ \frac{dU_i^e}{dN_i^s}}{\frac{dq_i^s(N_i^s)}{dN_i^s}}$$

$$(2.3) \ z_i = p_i^s \ q_i^s(N_i^s) = p_i^m q_i^e(N_i^e) \ \ \forall \ p_i^m = \frac{p_i^s q_i^s(N_i^s)}{q_i^e(N_i^e)}$$

Equation (2.3) determines the firm's supply function. Firms have to make their price decisions based on their expectations about prospective sales and market price. However, under perfect competition firms do not have market power to influence the market price so p_i^s will be equal to the expected market price (p_i^e). As $q_i^s(N_i^s)$ and $q_i^e(N_i^e)$ represent different functions, we can express the individual supply curve in terms of the supply price (p_i^m) and expected mand [$q_i^e(N_i^e)$]. In this case, for a given w and p_i^e, the firm's supply is higher than the firm's demand if $p_i^m > p_i^e$ at any level of hypothetical employment. These supply prices depend on firms' innovation. When firms innovate, their marginal cost curves shift rightwards and if their expected sales do not change, they will decrease prices till they are equal to the marginal cost at this level of expected sales or they might continue with the old price if their sale expectations are higher. Nevertheless, those shifts in individual marginal cost curves generate changes in the aggregate supply curve, which is the sum of all individual firms' marginal schedules. This evolutionary[5] process leads to the survival of the most efficient firms in the market and to the structural change that will determine the market price level. Firms that can fix a lower price than the

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[3] See Davidson (1994:19), Weintraub (1958: 25) or Palacio-Vera (2009: 25).
[4] Allain's profit equation [$\pi_i = p_i^e q_i(N_i) - w \ N_i$] does not take into account user cost (U_i^e). However, Keynes asserted that for individual firms "even if all production is carried on by a completely integrated firm, it is still illegitimate to suppose that the marginal user cost is zero..." (Keynes 1936: ch. 6).
[5] Hence, "innovation incessantly revolutionises the economic structure and this process of creative destruction is an essential fact about capitalism" (Freeman 1990: 17).

expected market price will do so although that might trigger a revision of firms' sales expectations as their current demand might exceed their expectations. On the other hand, this reduction in a firm price level will prompt other firms to reduce prices as well driving the market price level downwards and possibly pushing other firms' prices and expectations out of equilibrium. Hence, opposite to Hartwig's assumptions, firms' supply functions are subject to the uncertain and structurally changing nature of capitalist economies.

The Z curve can then be obtained by the aggregation of individual supply functions and represents different combinations of expected proceeds and prices at a given level of nominal wages that maximises firm's profits from the employment of any given expected amount of labour. This definition is clearly similar to Keynes' original one, as for any level of expected demand; the expectation of proceeds would be equal to the level of expected demand multiplied by the price that maximises its profit function from the employment of N people. This curve can be represented in the nominal wage and employment plane as in figure 2-1 or in the nominal proceeds and employment plane as in figure 2-2. A decrease in nominal wages shifts the Z-function rightwards in figures 2-2 and 3-1. Hence a lower nominal wage will be correlated with a higher profit maximization level of employment by firms as in figure 3-3.
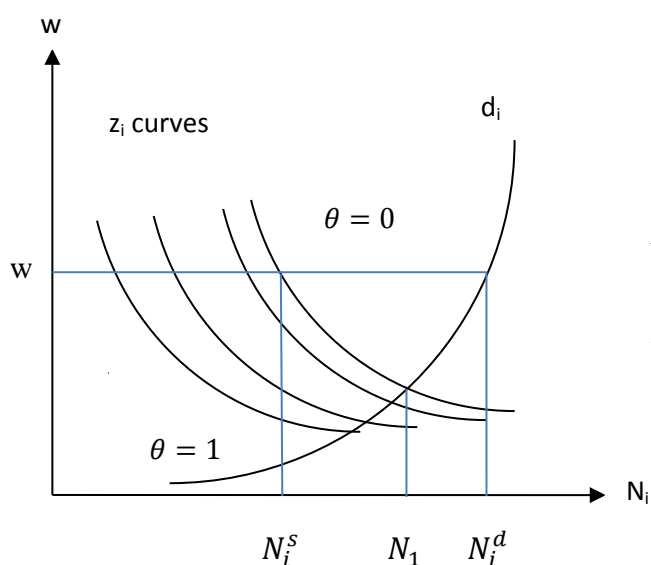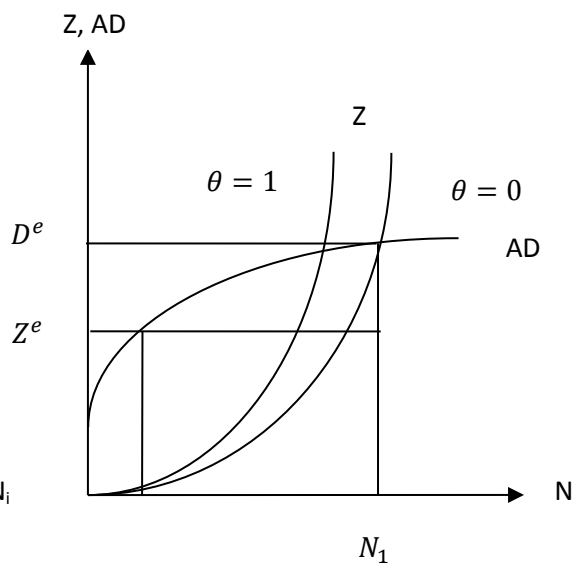

Figure 2-1: Different Pricing rules   **Figure 2-2: Z and AD functions**

Furthermore, Hartwig asserts that Weintraub, Davidson and Palacio-Vera all misinterpret Keynes by "mixing-up Keynes's D and Z curves into Z so that the latter not only shows the profit maximising proceeds for each N but also the expected proceeds" (Hartwig 2011: 8). He subscribes to Allain's (2009) interpretation as it "remains true to Keynes's own depiction of Z" (Hartwig 2011: 8).

However, in Allain (2009) the firm decides its demand for labour in order to maximise its profits. "The entrepreneur recruits so as to maximise his expected profit […] He then maximises his expected profits by recruiting $\tilde{n}_i$ workers…" Allain (2009: .7). Hence, according to Allain the demand for labour is already included in the supply curve. However, this is opposed to Keynes and Allain own assumption of a demand for labour that is determined by the intersection of the Z and AD curves. Firms determine their profit maximizing price level according to their expectations of future sales and market prices. Hence, they do not take employment decisions based only on the supply but also on the demand side.

Furthermore, Allain introduces the individual demand function into the profit maximization problem of the firm. However, the quantity variable in the demand function [$q_i(n_i)$ in Allain's terminology] could be dependent on other variables rather than just on the number of people the

firm employs (n_i). Hartwig is aware of that: "So is the demand an entrepreneur can expect...dependent on... the number of people he or she employs" (Hartwig 2011: 9). However, it is surprising that he thinks that Davidson, Weintraub and Palacio-Vera are the ones mixing up the Z and AD functions and not Allain. In contrast, AD does enter into the firm's decision about hiring but not by entering into the definition of the Z-function.

The First Classical Postulate, i.e. the Z curve, as it is outlined in this paper, is not a market equilibrium curve in Patinkin's sense[6] as Davidson (1983) asserts. Patinkin clearly shows that the market equilibrium curve is "the locus of intersection points of demand curves and their correspondent supply curves" (Patinkin 1965: 48). And it is clear that at a given nominal wages and expected prices, the amount of hypothetical labour that would maximize the firm' profits does not have to be the same as the amount they would *need* to hire to produce the amount they expect to be demanded.

Weintraub (1956)[7] has drawn the Z in the (Z/AD, N) plane and he defines Z as net of user costs. Keynes also defines Z as net of user cost and he represents the Z-function in terms of wage units (Zw) to demonstrate that employment can only increase if the reduction of nominal wages shifts the ADw-function rightwards as the Zw-function remains unchanged. However, Lavoie (1992) asserts that in the Post Keynesian case, the Aggregate Supply curve does not exist: "In the Post Keynesian model there is no aggregate supply function to speak of. The aggregate supply function of neoclassical models is an outcome of firms attempting to maximise potential profits according to the rule equating the real wage rate to the marginal product of labour." (Lavoie 1992: p. 244). Hence, according to him in Post Keynesian models firms are price setters and the pricing rule is a mark-up on average costs. However, this rule produces a set of curves shifting leftwards the higher the mark-up is in the nominal wages and employment plane as in figure 2-1 or in the nominal proceeds and employment plane as in figure 2-2. These curves can be interpreted as the different Z curves associated with different degrees of competition existing in the industry.

Additionally, "Keynes claimed his analysis is applicable to "any degree of competition" (Keynes 1936: 245)" (Davidson 2004: 249)[8]. Keynes' point was that even when competitive prices push the level of employment to its competitive level, full employment could not be guaranteed. However, this point cannot be illustrated until aggregate demand is introduced.

3. Aggregate Demand

> [...] let *D* be the proceeds which entrepreneurs expect to receive from the employment of *N* men, the relationship between *D* and *N* being written *D* = *f*(*N*), which can be called the *Aggregate Demand Function*." (Keynes 1936: ch. 3).

The expected demand of an individual firm (d_i) depends on the expected output and industry price as in (3-1.a).

(3-1.a) $d_i = p^e \; q^e[N^e(p^e, mc^e)]$

By aggregation of all individual firms' expected demands we obtain AD subject to firms' price and output expectations. For each level of nominal wages and expected prices, AD will relate

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[6] "In Keynes' analysis the net marginal product of labour (MP_L) is in Patinkin's (1965: 391-392) terminology, a market equilibrium curve..." (Davidson 1983: 106).
[7] See King (1994) for a summary on supply and demand analysis since Keynes.
[8] "To state the case more exactly, we have five factors which fluctuate in the short period with the level of output: (1) The price of wage-goods relatively to the price of the product; (2) The price of goods bought from outside the system relatively to money wages; (3) The marginal wage cost; (4) The marginal user cost (I attach importance to including this factor because it helps to bridge the discontinuity between an increase of output up to short-period capacity and an increase of output involving an increase beyond the capacity assumed in short-period conditions); and (5) The degree of the imperfection of competition". (Keynes 1939: 50).

levels of expected demand or proceeds to levels of hypothetical employment. Therefore, as AD is built with reference only to information available to firms, it might not be the correspondent level associated with Keynes' static equilibrium related to the long run propensity to consume.

In the Post Keynesian literature AD has been represented as the "desired expenditures" (Davidson 1994: 19), "intended outlays" (Weintraub 1958: 31) or just "the sum of expenditures of consumers, investors, foreigners and the government" (Palacio-Vera 2009: 26). Hence, the Aggregate Demand function (AD) would be calculated by adding the expected consumption, investment expenditures, government consumption and the balance of the trade account as following.

$$(3\text{-}1.b) \quad AD = C(w, p^e, N^e) + I(w, p^e, N^e) + G^e + (X - M)^e$$

However, Allain (2009) and Hartwig (2011) pointed out that AD, as expressed in equation (3-1.b), leads to the confusion of the AD with the Expenditure (E) function. The argument is that while proceeds (or total income) include the accumulation of liquid capital (I_L), total expenditures does not. Hence as Keynes defined AD in terms of expected proceeds this difference seems to be contradictory with Davidson, Weintraub and Palacio-Vera. There are a few elements in Allain (2009) and Hartwig's (2011) line of argument that misrepresent Keynes's work.

First of all, Allain's erroneous reading of Keynes leads him to the conclusion that Keynes evaluates demand alternatively from consumers' and investors' point of view. "Keynes analyses demand by adopting alternately the point of view of entrepreneurs and that of consumers and investors. He refers to an aggregate demand function (D) in the first case, to a global expenditure function (E) in the second case." (Allain 2009: 8). However, Keynes defined AD as the summation of firms' expectations about individuals' future consumption and investment. For Keynes, consumers' point of view only affects realised results of the production and sale of output and they "will only be relevant to employment in so far as they cause a modification of subsequent expectations" (Keynes 1936: ch. 5).

Second, there is no confusion between aggregate demand and current expenditures. As Keynes realised, habits need to be "given enough time to adapt themselves to changed objective circumstances" (Keynes 1936: ch. 8), for the multiplier to cause its full effect on employment. Before reaching its full effect, there might be a period of increasing employment and prices in which current level of expenditures might not be equal to the expected level of aggregate demand. This is especially the case when production is restricted from the supply side given nominal wages and expected prices. Expenditures are in this case restricted to a lower level of employment at which real wages are too high.

Third, Keynes defined "aggregate income (i.e. factor cost plus profit) resulting from a given amount of employment the proceeds of that employment" (Keynes 1936: ch. 3). Hence, it is equal to firms' receipts (A) minus user cost (U). However, this is also equal to the sum of aggregate consumption [$\sum(A - A_1)$] plus aggregate investment [$\sum(A_1 - U)$] as defined in chapter 6 of the *General Theory*. Hence, Keynes does not differentiate between aggregate income and aggregate expenditure; they are both defined for "hypothetical quantities of employment" (Keynes 1936: ch. 6) and there is no differentiation between investments in fixed, working or circulating capital as they are all part of income. Hence, both aggregate income and expenditure are defined for a specific value of the propensity to consume out of current income. This level depends on firms' short run expectations and might not coincide with the value in the static equilibrium level. Hayes and Allain assert that only short run price expectations influences firms production and employment decisions and it does not depend on firms' expectations about propensities to consume. However, for Keynes the question of how firms form their expectations is secondary because income and expenditures are defined for any expectation formation rule. Hence, the propensity to consume is the result of the aggregation of all entrepreneurs' demands for a given level of their short run expectations even if it does not influence the formation of expectations. Nevertheless, an increase in global employment will impact on firms' demands and expectations. Hence, Allain's conclusion that "A function such as D=D_1+D_2 cannot be built as an aggregate from the entrepreneurs' point of view" (Alain 2013: 17) is false.

Fourth, the reason for not giving great importance to changes in liquid capital has to wait till chapter 7.

> Mr Hawtrey regards the daily decisions of entrepreneurs concerning their scale of output as being varied from the scale of the previous day by reference to the changes in their stock of unsold goods. Certainly, in the case of consumption goods, this plays an important part in their decisions. But I see no object in excluding the play of other factors on their decisions; and I prefer, therefore, to emphasise the total change of effective demand and not merely that part of the change in effective demand which reflects the increase or decrease of un-sold stocks in the previous period. (Keynes 1936: ch. 7)

Hence, in the General Theory, Keynes treats the increase of circulating capital as desired. However, undesired accumulation or depletion of finished goods might have an effect on expectations. Nevertheless, Keynes felt that he dealt with that sort of change in his *Treatise on Money* "It was movements of this kind which I discussed in my Treatise on Money in connection with the building up or the depletion of stocks of working and liquid capital consequent on change" (Keynes 1936: ch. 5). Undesired or forced level of investment leads us to the notion of forced savings. On the other hand, Keynes pointed out that Hayek's forced savings definition did not refer to this undesired accumulation.

Hence, Allain (2009) and Hartwig (2011)'s criticisms of Post Keynesian theory misrepresent Keynes's own arguments.

Another point of disagreement is Weintraub's (1958) assumption that "it should be apparent, however, that embedded in each point on the aggregate demand function, D, will be the same prices that are found in Z at corresponding N-points" (Weintraub 1958: 32). On one hand, it can be seen in figure (2-2) that for a single firm at the expected price (p_0^e) when the level of expected proceeds is (Z^e) the volume of employment that would maximise profits is higher than the volume of employment forthcoming to produce the expected proceeds at a given nominal wage. Hence, at the given nominal wage and expected market price, the firm will employ the amount of labour determined by the demand function. That implies that the firm will not be producing at profit-maximising prices and hence the price embedded in the demand function differs from the supply price. On the other hand, in figure (3-1) at N_1 let us assume that the expected price level included in the AD curve responds to the maximization of profit rule as Weintraub suggests. That would mean that at any hypothetical employment level in the aggregate demand, commodities are being optimally produced for any price level. This price is equal then to the price included in the Z curve for any hypothetical level of employment. Hence, at N_1, the aggregate supply that will make hiring this amount of labour worthwhile (Z_1^e) is higher than the nominal expected value of the aggregate demand (D_1^e). However, both quantities would be produced at maximising prices and therefore for any level of employment there would not be a unique level of expected proceeds for which hiring that amount of labour will be worthwhile. Instead of assuming that the same prices are embedded in Z and AD for any given nominal wage and propensities to consume, firms would be expected to hire the amount of labour forthcoming at the expected proceeds that would make giving that amount of labour worth the while [see Graphic Appendix].

Furthermore, at this volume of hypothetical employment (N_d), the supply price (p^m) could be higher, equal or lower than the expected or demand price (p^e) involved in the AD. When the supply price is higher than the demand price firms could expand profits by lowering prices as there is excess supply of commodities at this nominal wage and expected price level. As current prices plummet, so do expectations of future prices until the equilibrium price is reached. When the supply price is lower than the expected price the reverse mechanism takes place and firms will raise prices until the supply price is equal to the expected price. Nevertheless, expectations on prices might be fulfilled yet the speed of adjustment of current prices might be sluggish enough for Z to lag behind AD. In this case employment could increase to the level limited by Z. Further increases in employment will be correlated with price hikes.

This explains Keynes' assumption that if the expected proceeds are higher than the aggregate supply at any given employment level firms will be induced to increase production and prices

up to the value where Z equals AD. "[…] if *D* is greater than *Z*, there will be an incentive to entrepreneurs to increase employment beyond *N* and, if necessary, to raise costs by competing with one another for the factors of production, up to the value of *N* for which *Z* has become equal to D" (Keynes 1936: ch. 3). Furthermore, AD is defined by Keynes for hypothetical levels and not for current levels of employment. "The aggregate demand function relates various hypothetical quantities of employment to the proceeds which their outputs are expected to yield" (Keynes 1936: ch. 6). The argument will be explained further when the AD and Z functions are represented in the nominal wage and employment plane. However, we have already seen above that individuals' habits need to be given enough time to adapt themselves. During this period of adjustment the propensities to consume and invest will not be the long run equilibrium values. Therefore, during adjustment current proceeds will not yet achieve their expected value at the given nominal wages or prices.

To portray AD and Z functions in the (w, N) plane let us first observe that AD is a function of not just employment, as in Keynes' notation in chapter 3, but of nominal wages and expected prices as well. Nevertheless, Keynes defined AD for given values of nominal wages and expected prices. A similar notation can be seen in Davidson (1994): "the aggregate demand function is represented as $D = f_d(w, N)$" (Davidson 1994: 179). But of course Davidson demand prices are equal to supply prices as Weintraub (1958) assumed. When both supply and expected demand prices are different, AD could be expressed as a function of nominal wages, expected prices and employment.

(3-2) $AD = f_d(p^e, w, N)$

Changes in nominal wages and expected prices have different effects on AD[9]. From the Aggregate Demand equation as portrayed in figure (3.2) it is possible to derive the function that relates to hypothetical employment levels as a function of expected prices, nominal wages and a given number of exogenous variables and parameters that will be assumed to depend on the current state of long-term expectations:

(3-3) $N = f(w, p^e)$

From figures (3-1) and (3-3) we can deduce how to build equation (3-3). For a given nominal wage and expected prices (w_0, p_0^e) the employment forthcoming for the expected proceeds (Z_0^e) will be equal to (N_1). At a lower nominal wage (w_1) at the same expected prices the volume of employment forthcoming at the same expected proceeds will be equal to (N_0). In figure (3-3), (w_0, N_1) and (w_1, N_0) form part of the aggregate demand curve in the (w, N) plane defined in equation (3-2) for a given expected prices (p_0^e). In figure (3-4), given price expectations (p_0^e), for nominal wages higher than (w_e) the amount of labour employed will be determined by the supply curve. However, if prices were infinitely elastic the existence of an excess of demand would quickly shift both curves as current and expected prices respond to this surplus till equilibrium is reached, as we will see in section 4.

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[9] This was already realised by Malthus "it has not been possible always to make a distinction between the effects of a fall in the price of corn, and a rise in the money price of labour. In merely comparing the two objects with each other, the result is precisely similar; but their effects on the demand for labour and the encouragement to population are sometimes dissimilar, as I have before intimated..." (Malthus 1836: Section V).
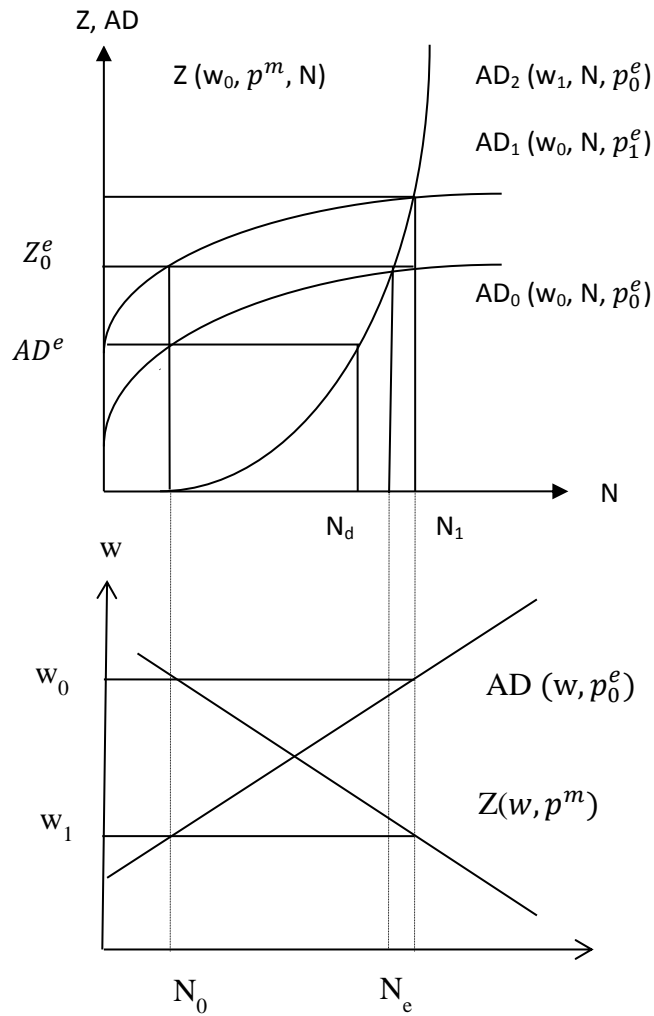
Figure 3-1: **Z and AD** $\qquad$ **Figure 3-2: the fallacious demand for labour**

Z, AD

$Z\,(w_0, p^m, N)$

$AD_2\,(w_1, N, p_0^e)$

$AD_1\,(w_0, N, p_1^e)$

Z_0^e

$AD_0\,(w_0, N, p_0^e)$

AD^e

N

N_d N_1

$N^d{}_0\,(w, N, p_0^e)$

$N^d{}_1\,(w, N, p_1^e)$

w_0

N

N_0 N_1

w

w_0

$AD\,(w, p_0^e)$

$Z(w, p^m)$

w_1

N_0 N_e

w

w^0

$AD\,(w, p_0^e)$

w^e

$Z\,(w, p^m)$

N

N^0 N^1

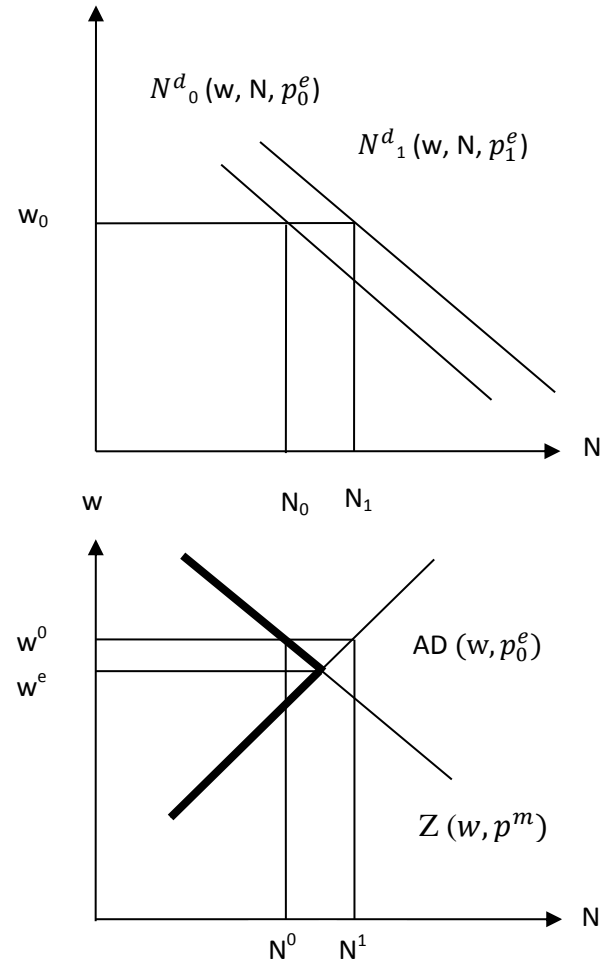**Figure 3-3: Z and AD in (w, p)** $\qquad$ **Figure 3-4**: **The short side of the market**

4. The Demand for Labour

For Keynes "The amount of labour N which the entrepreneur decides to employ depends on …what we have called above the effective demand." (Keynes 1936: ch. 3). And Effective Demand is defined by Keynes as "The value of D at the point of the aggregate demand function, where it is intersected by the aggregate supply function, will be called the effective demand" (Keynes 1936: ch. 3). Therefore, according to Keynes the demand for labour curve cannot be deducted from the AD curve on its own as Lavoie (1992) argues.

The derivation of the demand for labour when price expectations are fulfilled and prices are totally elastic can be seen in figure (4-1). From a position of equilibrium at (w^0, N^0), an increase in nominal wages and the resulting increase in current and expected prices shift the Z curve to the right from Z^0 to Z^1 and the AD to the left from AD^0 to AD^1. The new equilibrium point, at (w^1, N^1), shows that in this case the demand for labour equation is upward sloping as nominal wages and employment have a positive relationship.

Hence, the slope of the demand for labour can be seen in equation (4-5) and portrayed in figure 4-1.
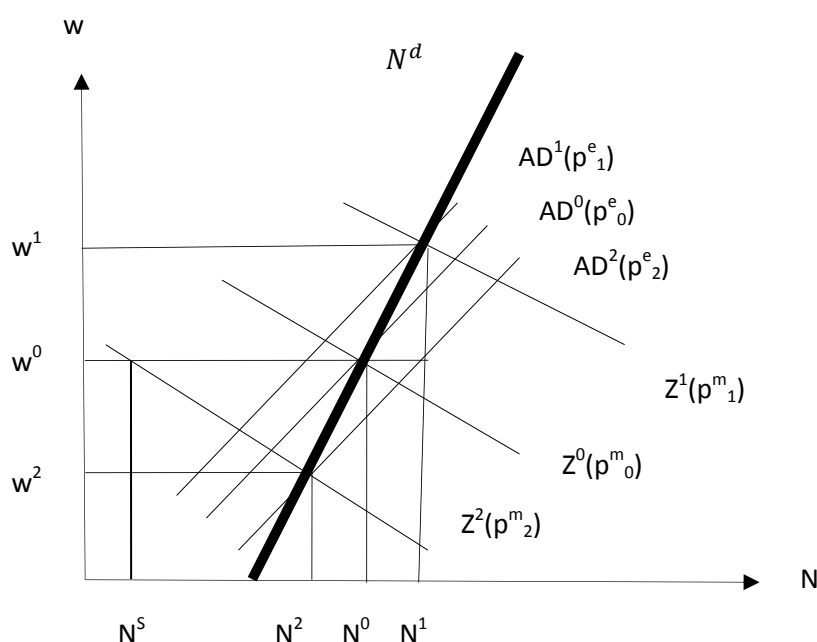

Figure 2: The Demand for Labour

(4-5) $\quad \dfrac{dN}{dw} = \dfrac{\partial f(w,p)}{\partial w} + \dfrac{\partial f(w,p)}{\partial p}\dfrac{dp}{dw}$

The slope of the demand for labour function will therefore be positive if prices have a positive effect on the aggregate demand equation or, even if this effect is negative, the positive effect of nominal wages on the aggregated demand is high enough to offset the possible negative price effect:

(4-6) $\quad \dfrac{\partial f(w,p)}{\partial w} > -\dfrac{\partial f(w,p)}{\partial p}\dfrac{dp}{dw}$

However, if we assume a decreasing marginal productivity of labour, the slope of the demand for labour is now:

$$(4\text{-}7) \quad \frac{dN}{dw} = \frac{\frac{\partial f(w,p)}{\partial w} + \frac{\partial f(w,p)}{\partial p}\frac{\partial g(w,mp)}{\partial w}}{\left(1 - \frac{\partial f(w,p)}{\partial p}\frac{\partial g(w,mp)}{\partial mp}\frac{\partial mp}{\partial N}\right)}$$

The introduction of decreasing marginal returns now reveals that the slope of the demand for labour might be positive even if

$$\frac{\partial f(w,p)}{\partial w} + \frac{\partial f(w,p)}{\partial p}\frac{\partial g(w,p)}{\partial w} < 0 \text{ when } \frac{\partial f(w,p)}{\partial p}\frac{\partial g(w,mp)}{\partial mp}\frac{dmp}{dN} > 1$$

We can also see that increasing marginal returns do not in general make the slope of the demand for labour positive as this will also depend on the signs of the partial derivatives. In Figure 4-1 we can see that at w_0, both Z and AD cross each other at the level of employment N, the Effective Demand for labour.

In Figure 4-1, let us start from a situation where firms are optimising profits and commodity markets are in equilibrium but there is disequilibrium in the labour market as in w_0 and N^0. A decrease in nominal wages – from w^0 to w^2 - will create excess supply in the commodity market which will cause deflationary pressures until Z is equal to AD. The resulting lower prices will change maximising and expected prices, shifting Z leftwards and AD rightwards or leftwards, creating a new equilibrium point at a lower employment N^2. The analysis shows the dynamic process through which equilibrium is achieved from a position of excess supply disequilibrium in the Keynesian model, i.e. the mechanism of adjustment where employment and prices are adjusting to supply and demand conditions in the markets. At any given nominal wage, current and expected prices all change until they are all equal when equilibrium is achieved. Hence, at the equilibrium point expected prices have adjusted to that level.

Therefore, another incorrect interpretation would be to assume that the demand for labour depends on the expected price. If that is correct, the demand for labour function will shift according to different values in expected prices. As we can see in figure (3-2) the demand for labour N^d_0 (w, p^e_0) would shift rightwards to N^d_1 (w, p^e_1) as the expected price changes from p^e_0 to p^e_1. However, as we have seen, firms' price expectations affect the supply and demand side shifting both curves and changing their point of intersection. However, at a given nominal wage there will only be one level of expected prices that will be compatible with equilibrium in the commodity market. Hence there is only one level of firms' expected market prices that will be compatible with the demand for labour at a given nominal wage.

This incorrect interpretation can be seen in Chick (1983) where the employment functions are seen as demand for labour curves shifting rightwards as expected prices increase. "The higher price shifts the demand curve for labour to, say, N_1^D..." (Chick 1983: 148). In Figure 4-1 we can observe the difference between the Z curves, shifting rightwards as price increases, and the demand for labour curve. This interpretation obscures the short run dynamic texture of Keynesian economics[10] where the price level is allowed to adjust to disequilibrium in the commodity market and to changes in the employment level. In equilibrium, prices are assumed to have moved freely which is of course consistent with Keynes' proposition that unemployment might occur even if there is not rigidities in the price mechanism. Hence, the Keynesian labour demand function does not shift according to current or expected prices as Chick suggests but it is the result itself of the dynamic process towards equilibrium. However, the reason why Keynes was not interested in the short run dynamics is simply the purpose of his enquiry into the causes of non-classical unemployment that might occur when price is assumed to be infinitely flexible and expectations are fulfilled, i.e., the static equilibrium level.

Nevertheless, according to Keynes a temporary equilibrium might exist when expectations are not fully foreseen. In this case prices will adjust to the level of partial foresight. At this point

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[10] "Keynesian" is meant here to signify Keynes' original ideas, not the interpretations of Keynes' ideas that have obscured Keynesian economic thought.

Z is equal to AD. Nonetheless, the theory of shifting equilibrium does not refer to temporary short run adjustments but to long run dynamics contrary to Hayes' (2013) proposition .We cannot say at this point that equilibrium will be struck every period as Hayes suggests. Also conflicting with Allain (2013), Hartwig (2013) and Hayes (2013), prices and expectations will need some time to adjust to that level of partial foresight and Z will not be equal to AD during this process of short run dynamic adjustment. Hence, this point of temporary equilibrium corresponds to a particular level of price expectations and for all other expectations there will not be temporary equilibrium. Nevertheless, expectations will be adjusting eventually to what Keynes called static equilibrium. Hence, although the effective demand schedule and therefore the unemployment level might be stuck due to partial foresight, it was not the sort of unemployment Keynes was trying to explain. This type of unemployment will be corrected once expectations have fully adjusted to the state of the long run variables. At a given nominal wage there will be only one level of employment and prices that could be coherent with equilibrium. However, for Hayes "aggregate demand and supply are in static equilibrium at all times" (Hayes 2007: 16). I think Allain (2013) and Hartwig (2013) also agree on this point with Hayes.

Yet, if that was the case, for a given w and price expectation, the individual firm could always choose a level of employment that will equal its supply and demand. In the (Z/AD, N) plane representation in figure (2.2), for any w and price expectation level, it might seem possible for the firm to choose the level of employment (N_1). However, as it can be seen in figure 2.1, for a given w and expected market price, the employment level necessary to produce the expected proceeds are higher than the employment level that this particular firm will be willing to employ given its marginal cost function, i.e. the expected proceeds would be higher than the expected proceeds that will make giving that amount of employment worth the while. Therefore, the firm cannot choose an "ex-ante" equilibrium level of employment because there is none at this w and expected market price and as the short side of the market determines the level of employment at any given w and pe, the difference between Z and AD explains why firms are not producing more. "I do not remember attributing the disappointment of entrepreneurs to a divergence between aggregate demand and aggregate supply price. I attribute their failure to produce more to this; but their disappointment, if any, I attribute to a divergence between aggregate demand price and income" (Keynes 1973: 89). Here, Keynes refers to the difference between ex-post income and ex-ante income or aggregate demand price as the source of firms' disappointment as price and employment have not reached the level at the effective demand schedule (EDS).

Additionally, if the EDS and hence the Demand for Labour have a positive slope, a decrease in nominal wages might actually create a higher disequilibrium in the labour market instead of decreasing it. Hence, the allegedly self-adjusting mechanism ceases to exist in this framework and the whole Neo-Liberal principle of promoting higher liberalisation and flexibilisation to achieve full employment becomes irrelevant and ineffective as a policy recommendation to economic growth. Furthermore, government policies aimed at an increase in the average nominal wage might bring the economy towards equilibrium. Hence, the analysis of the EDS's slope is crucial to establish any guidance for economic policies.

5. Conclusion

The intention of this paper has been to shed some light on a unified Post Keynesian framework. Keynes' theory is applicable to any degree of competition or any Z curve. These pricing rules have different effects on employment. Nevertheless, Keynes' point was to demonstrate that even under the competitive pricing rule unemployment equilibrium might still happen and that there might not be a tendency towards full employment. We have also seen that the demand for labour curve takes into account the conditions of both supply and demand curves. Hence, it is calculated from the intersection of the Z and AD curves. At this respect the Z curve cannot be an equilibrium curve in Patinkin's sense. Furthermore, the demand for labour represents an equilibrium condition where price, nominal wages and employment have simultaneously adjusted to their equilibrium levels. During this adjustment process Z will not be equal to AD. Perhaps the main advantage of portraying AD and Z in the nominal wage and employment plane is that it allows the visualisation of the short run dynamic texture of Keynesian economics. As we

can see in Figure 4.1, prices and employment are assumed to adjust to the conditions of supply and demand simultaneously when prices are totally flexible and expectations are fulfilled. Keynesian economics or the economics of Keynes must reflect this dynamic mechanism through which equilibrium is achieved. This short run adjustment is characterised by the dynamic condition that all the endogenous variables are simultaneously inducing each other through time as opposed to comparative dynamics where the effect of one variable on another is a comparison of states within the same time scale. When the slope of the demand for labour is positive, increasing nominal labour costs will actually increase employment, i.e. the Paradox of costs holds. In spite of Buchanan's[11] draconian review of a positive effect of minimum wages on employment, this paper draws on theoretical arguments to suggest that higher minimum wages might actually increase employment by increasing the average nominal wage.

References

Allain, Olivier. 2009. Effective Demand and Short-term Adjustments in the General Theory, *Review of Political Economy* 21(1), pp. 1-22.

Blue Book. 2009. *Correction Notice United Kingdom National Accounts*. Office for National Statistics.

Buchanan, James McGill. 1996. Minimum Wage Addendum, *Wall Street Journal*, pp. 04-25.

Chick, Victoria. 1983. *Macroeconomics after Keynes*. Oxford, Philip Allan.

Davidson, Paul. 1983. The marginal product curve is not the demand curve for labour and Lucas' labour supply function is not the supply curve for labour in the real world, *Journal of Post Keynesian Economics* VI(1).

Davidson, Paul. 2003-2004. Setting the record straight on A History of Post Keynesian Economics, *Journal of Post Keynesian Economics* 26 (2), pp. 245-272.

Freeman, Christopher. 1998. *Schumpeter's Business Cycles Revisited*. Viterbo, Fondazione Carivit, Universita della Tuscia..

Hartwig, Jochen. 2009. D and Z in ROPE- Will the Real Keynes Stand Up? KOF Working Papers.

Kalecki, Michael. 1971. *Selected Essays in the Dynamics of the Capitalist Economy*. Cambridge University Press.

Keynes, John Maynard. 1936. *The General Theory of Employment, Interest and Money*. http://www.marxists.org/reference/subject/economics/keynes/general-theory.

Keynes, John Maynard. 1939. Relative Movements of Real Wages and Output, *The Economic Journal* 49 (193), pp. 34-51.

Keynes, John Maynard. 1936. Letter to Robertson published in 1973. The General Theory and after, Part II: Defence and Development. XIV of *Collected Writings of John Maynard Keynes*. London, Macmilan.

Malthus, Robert Thomas. 1836. *Principles of Political Economy.* http://oll.libertyfund.org/index.php?option=com_staticxt&staticfile=show.php%3Ftitle=2188&Itemid=28.

Minsky. Hyman Philip. 1975. *John Maynard Keynes*. McGraw Hill, Columbia University Press.

Lavoie, Marc. 1992. *Foundations of Post-Keynesian Economics Analysis*. Edward Elgar.

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[11] "[...] no self-respecting economist would claim that increases in the minimum wage increase employment. Such a claim, if seriously advanced, becomes equivalent to a denial that there is even minimum scientific content in economics, and that, in consequence, economists can do nothing but write as advocates for ideological interests. Fortunately, only a handful of economists are willing to throw over the teaching of two centuries; we have not yet become a bevy of camp-following whores."(Buchanan 1996: A20).

Palacio Vera, Alfonso. 2009. Capital Accumulation, Technical Progress and Labour Supply Growth: Keynes's Approach to Aggregate Supply and Demand Analysis Revisited, *Review of Political Economy* 21 (1), pp. 23-49.

Patinkin, Don. 1965. *Money, Interest and Prices*-An integration of Monetary and Value theory. Jointly published by Harper & Row and John Weatherhill. 2nd edition.

Weintraub, Sidney. 1956. A Macroeconomic Approach to the Theory of Wage, *American Economic Review* December 46, pp. 835-856.

Weintraub, Sidney. 1958. *An Approach to the theory of Income Distribution*. Connecticut, Greenwood press. Westport.