EXPECTATIONS, EMPLOYMENT AND PRICES: A SUGGESTED INTERPRETATION OF THE NEW 'FARMERIAN' ECONOMICS

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Abstract

This paper aims at providing a critical assessment of the new 'Farmerian' economics, *i.e.* the recent Farmer's attempt to provide a new microfoundation of the *General Theory* grounded on modern search and business cycle theories. Specifically, I develop a theoretical model that summarizes the main arguments of the suggested approach by showing that a special importance has to be attached to the search mechanism, the choice of units and 'animal spirits' modelling. Thereafter, referring to self-made real-business-cycle experiments, I discuss the main empirical implications of the resulting framework. Finally, I consider its policy implications by stressing the problematic nature of demand management interventions and the advisability of extending the role of the central bank in preventing financial bubbles and crashes**.

Keywords: New 'Farmerian' Economics, Search Theory, Demand Constrained Equilibrium, Bubbles and Crashes

JEL Classification: E12, E24

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1 Introduction

In a recent array of papers and a book, Farmer (2008a-b, 2009, 2010a-b-c) provides a new micro-foundation of Keynes's (1936) *General Theory* grounded on modern search and business cycle theories. Specifically, Farmer's (2008a-b, 2009, 2010a-b-c) research agenda aims at combining some fundamental Keynesian ideas – such as the importance of beliefs and expectations in determining the level of the economic activity via effective demand and the idea that there is something distinctive about the labour market – with the traditional Walrasian general equilibrium theory without relying on the sticky price assumption. The result of this ambitious work is a competitive two-sided search framework in which labour instead of output is used to post vacancies, output and employment are demand driven, the nominal wage is used as numeraire while prices are assumed to be perfectly flexible. The refusal of the sticky price hypothesis is a feature that distance Farmer's (2008a-b, 2009, 2010a-b-c) framework from the New Keynesian paradigm by building the bases of a new theoretical paradigm closer to the 'Old Keynesian' economics as interpreted by Leijonhufvud (1968).

In this paper, I aim at providing a critical assessment of the New 'Farmerian' economics. First, following Guerrazzi (2010) I provide and discuss a simple theoretical model that summarizes the main arguments of the suggested approach by showing that a special importance has to be attached to the search mechanism, the choice of units and 'animal spirits' modelling. An interesting theoretical finding coming from the resulting framework is the possibility of an endogenous real stickiness in the neighbourhood of the first-best allocation.

Thereafter, referring to self-made real-business-cycle (RBC) experiments (e.g. Guerrazzi 2010 and Gelain and Guerrazzi 2010), I discuss the main empirical implications of the New 'Farmerian' economics by stressing its potential to explain recent evidence on macroeconomic fluctuations and some stylized facts about the mild volatility of labour productivity *vis-à-vis* the wide oscillations in labour market tightness indicators.

Moreover, I consider the policy implications of the New 'Farmerian' economics by stressing the

problematic nature of traditional demand management interventions and the advisability of extending the role of the central bank in preventing financial bubbles and stop crashes through the stabilization of stock and housing market prices.

Finally, I put forward the lines for new theoretical and empirical developments by emphasising that an additional effort has to be addressed towards the actual determination of expectations and their transmission to the real economy.

The paper is arranged as follows. Section 2 provides a simple theoretical framework. Section 3 discusses its empirical implications. Section 4 provides some policy implications. Finally, section 5 concludes.

2 Theoretical Framework

In this section, following Guerrazzi (2010), I develop a simple theoretical framework that summarizes the main arguments put forward by Farmer (2008a-b, 2009, 2010a-b-c). Specifically, resuming some elements of Cambridge theory of distribution (e.g. Kaldor 1955-1956), I consider a model economy in which a unit mass of two kinds of price-taking heterogeneous agents coexist in a time-less environment.[1] Each kind of agents refers to an income earners' category which is assumed to be characterized by a specific propensity to consume and a specific task. On the one hand, wage earners, *i.e.* the owners of labour services, are saving-constrained and consume the whole income raised by supplying a fixed endowment of labour that can be allocated to production or recruiting activities. On the other hand, profit earners, *i.e.* the owners of the capital stock and/or overhead workers, save the whole income raised by employing wage earners and arranging a stochastic production process.[2] The net-of-wage payments saved by profit earners implicitly define the yield on employed capital and are exploited to finance the investment expenditure. Moreover, in order to pin down the equilibrium of the model economy, I assume that profit earners' investment expenditure is exogenously given through the so-called 'state of long-term expectations', *i.e.* a latent variable that conveys the 'animal spirits' of profit earners.

2.1 Wage Earners

Without loss of generality, I assume the existence of a large number of identical unit-mass wage earners. Thereafter, the problem of the representative wage earner is given by

$$\begin{aligned} &\max_{C} \ \log(C) \\ &\text{s.to} \quad , \\ &pC \le wL \\ &L + U = H \end{aligned} \tag{1}$$

where C is real consumption;
p is the price level;
L is the fraction of employed wage earners;
w is the nominal wage;
U is the fraction of unemployed wage earners while $H = 1$ is the individual fixed labour supply.

At the individual level, current employment and labour supply are assumed to be linked by the following expression:

$$L = hH = h, \tag{2}$$

where h is hiring effectiveness.

The hiring effectiveness – taken parametrically by wage earners – can be determined as

$$h = \frac{\bar{L}}{\bar{H}} = \bar{L}, \tag{3}$$

where $\bar{L}$ is aggregate employment while $\bar{H} = 1$ is the aggregate labour supply.

The expression in (3) conveys a typical 'thick' market externality, i.e. the higher (lower) the aggregate employment rate, the easier (harder) for a wage earner to find a job (*e.g.* Diamond 1982).

The solution of the problem in (1) is given by

$$C = \frac{w}{p} L. \tag{4}$$

2.2 Profit Earners

Symmetrically with wage earners, I assume the existence of a large number of identical unit-mass profit earners. Thereafter, the representative profit earner is assumed to arrange the production of a homogeneous-perishable good by means of the following Cobb-Douglas production function:

[1] The resumption of the Cambridge theory of distribution is not meant to represent a society divided in proletarians and capitalists. On the contrary, this theory is meant to represent a model economy in which the equilibrium on the market for goods determines (*inter alia*) the real wage. This feature can be very important with a search labour market that does not deliver any price signal (*e.g.* Solow and Stiglitz 1968).

[2] Following the cash-flow criterion by Abel *et al.* (1989), these two assumptions place the economy in the border-line region between dynamic efficiency and inefficiency. However, in the analysis that follows nothing would be changed by assuming that profit earners consume a share of their investment expenditure. The 'usual' situation in which investments are financed out the savings of workers is analyzed in the overlapping generations (OLG) model developed by Farmer (2010b, Chapter 4).

$$Y = AK^{\alpha}X^{1-\alpha} \qquad 0<\alpha<1, \qquad (5)$$

where Y is output,

A is a common-knowledge productivity shock;

K is the fixed capital stock;

X is the fraction of employed wage earners allocated to production activities while α $(1-\alpha)$ is the output elasticity with respect to capital (labour).[3]

Taking the production function in (5) into account, the problem of the representative profit earner is the following:

$$\begin{array}{c} \max\limits_{V} \; pAK^{\alpha}X^{1-\alpha} - wL \\ \text{s.to} \\ I = Y - \left(\frac{w}{p}\right)L \\ L = X + V \end{array}, \qquad (6)$$

where I are investments in real terms while V is the fraction of employed wage earners allocated to recruiting activities by the representative profit earner.

Current employment and the fraction of wage earners allocated to recruiting activities are assumed to be linked by

$$L = vV, \qquad (7)$$

where v is the recruiting efficiency.

The expression in (7) is aimed at providing a micro-foundation for applications processing and it suggests that each profit earner knows that V corporate recruiters can hire vV wage earners X of whom will be employed in production activities.

Similarly to the hiring effectiveness, the recruiting efficiency – taken parametrically by the individual profit earner – can be determined as

$$v = \left(\frac{\bar{L}}{\bar{V}}\right), \qquad (8)$$

where $\bar{V}$ is the fraction of wage earners allocated to recruiting activities by all profit earners in the whole economy.

Taking into account of the results in (6) and (7), the first-order condition (FOC) for the problem in (6) can be written as

$$\left((1-\alpha)\frac{Y}{L} - \left(\frac{w}{p}\right)\right)(p+\lambda) = 0, \qquad (9)$$

where λ is the Lagrange multiplier on the real investment resource constraint.

2.3 Search

Now I describe how searching wage earners find jobs in the economy as a whole. Specifically, following Farmer (2008a-b, 2009, 2010a-b-c), the aggregate search technology that moves wage earners towards profit earners is assumed to be given by the following Cobb-Douglas matching function:

$$\bar{L} = \bar{H}^{\gamma}\bar{V}^{1-\gamma} \qquad 0<\gamma<1, \qquad (10)$$

where γ is the matching elasticity.

The expression in (10) suggests that aggregate employment is the result of the matching between all the job seeking wage earners and the corporate recruiters employed by all the profit earners displaced in the whole economy. Therefore, in contrast to the standard matching approach popularized by Pissarides (2000), Farmer (2008a-b, 2009, 2010a-b-c) assumes that vacancies are posted by using labour instead of output.

Considering the unit value of the fixed aggregate – and individual – labour supply, (10) simplifies to

$$\bar{L} = \bar{V}^{1-\gamma}, \qquad (11)$$

The expression in (11) describes how aggregate employment is related to the aggregate recruiting effort arranged by all the profit earners. Again, taking into account the unit value of the fixed labour supply, a simple manipulation of (11) also allows to derive a stable trade-off between the aggregate level of recruiters and the total amount of job seeking wage earners which provides a version of the well-known Beveridge curve that, in turn, summarizes the operation of search and production externalities in the whole economy.[4] Specifically,

$$\bar{V} = \left(1-\bar{U}\right)^{\frac{1}{1-\gamma}}, \qquad (12)$$

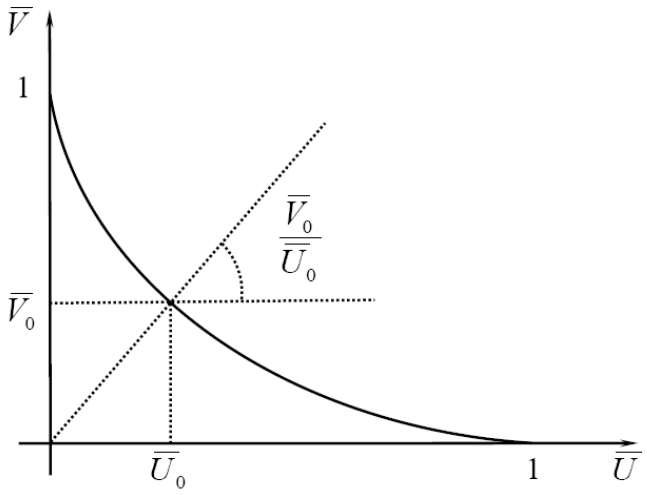
where $\bar{U}$ is the aggregate unemployment rate.

[3] In conventional RBC models the log of A is assumed to follow a stochastic first-order autoregressive process that drives the trend of the model economy (*e.g.* Kydland and Prescott 1982).

[4] The stability of the Beveridge curve is argued by Abraham and Katz (1986).

Such a Beveridge curve is illustrated in figure 1.

Figure 1. Beveridge curve



The Beveridge curve in figure 1 crosses the vertical axis when all the wage earners are allocated to recruiting activities and there is no unemployment while it crosses the horizontal axis when all the wage earners are unemployed and no profit earner carries out recruiting activities. Moreover, the higher (lower) γ, the closer (more distant) the Beveridge curve from its Cartesian references. This geometrical feature can be quite useful; indeed, Solow (1998) provided a definition of labour market flexibility in terms of the Beveridge curve distance from its axes. Specifically, the closer (more distant) the Beveridge curve from its axes, the more (less) flexible the labour market. As a consequence, in this framework γ provides a ready-to-use measure of labour market flexibility.

In spite of the unit of measurement of job vacancies, the Beveridge curve adopted in the traditional matching approach popularized by Pissarides (2000) is different from the one in (12). Specifically, such a negative relationship between job vacancies (or recruiters) and unemployment is usually derived by considering the steady-state of a dynamic law for employment in which the outflows are given by a fixed fraction of the employed labour force while the inflows are described by a constant-returns-to-scale Cobb-Douglas combination between vacancies and unemployment. Therefore, closer to Farmer's (2008a-b, 2009, 2010a-b-c) search proposal seems to be Hansen's (1970) seminal approach to vacant jobs who derived a negative equilibrium relationship between job vacancies and unemployment from more primitive assumptions on the frictions of an auction labour market in which actual employment is never on the supply curve (if the wage rate is below equilibrium) or the demand curve (when above equilibrium), but to the left of both the demand and supply curve (Hansen 1970, p. 6).

Considering a situation of 'symmetric' equilibrium, *i.e.* a situation in which $\overline{L} = L$ and $\overline{V} = V$, then it becomes possible to convey the recruiting efficiency as a function of aggregate employment. Specifically, exploiting the results in (6), (7) and (11) it is possible to derive

$$v = L^{\frac{-\gamma}{1-\gamma}}. \tag{13}$$

In contrast to (3), the expression in (13) conveys a typical 'thin market' externality, i.e. the recruiting efficiency relevant for profit earners' problem is higher (lower), the lower (higher) is aggregate employment (e.g. Diamond 1982). This external effect has the same impact on profit earners as a positive (negative) productivity shock.

2.4 Social Optimum

In order to have an efficient benchmark for the evaluation of realized allocations, I analyze the problem of an omniscient-impartial social planner who can operate simultaneously the production and the matching technologies by internalizing the externality factor in (13). In a subsequent part of the paper, this exercise will provide some insights on the properties of the equilibrium wage function.

Assuming that the social planner attaches the same weight to each income category, the Pareto-optimal allocation is defined by the level of employment that maximizes the sum between wage income and the net-of-wage payments in real terms, *i.e.* the level of L that maximizes the real output for any given level of the productivity shock and the stock of employed capital. As a consequence, taking

into account of the results in (5), (6), (7) and (13) the social planner problem is the following:

$$\max_{L} \quad AK^{\alpha}\left(L\left(1-L^{\frac{\gamma}{1-\gamma}}\right)\right)^{1-\alpha}. \tag{14}$$

Therefore, the social-optimal level of employment is given by

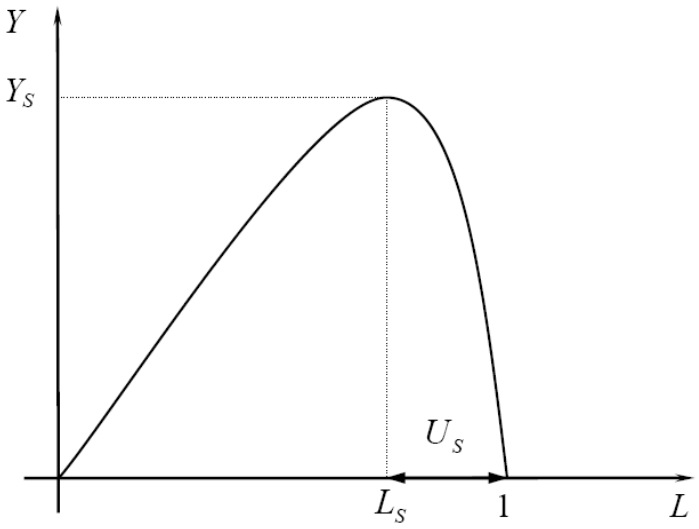
$$L_S = (1-\gamma)^{\frac{1-\gamma}{\gamma}}. \tag{15}$$

Obviously, $U_S = 1 - L_s$ provides the social-optimal unemployment rate.

It is worth noting that L_S and U_S depend only on the unique parameter of the matching technology that also conveys the steepness of the Beveridge curve. Specifically, the higher (lower) γ, the lower (higher) the social-optimal level of employment. As a consequence, having in mind the argument about γ as a measure of labour market flexibility, the model economy displays a trade-off between efficiency and flexibility, *i.e.* a more (less) flexible labour market conveys a lower (higher) social-optimal employment rate.

The social planner problem is illustrated in figure 2.

Figure 2. Social-optimal level of (un)employment



The diagram in figure 2 allows to clarify some important features of the production and matching technologies. Obviously, whenever $L = 0$ there is no production because no wage earner is employed. However, there is no production even when $L = 1$. In this case, taking the result in (13) into account, the aggregate recruiting efficiency would be equal to 1. Therefore, profit earners would be lead to allocate all the employees to recruiting while no wage earner would be allocated to production activities.[5] As a consequence, total output is at its maximum level Y_S whenever $L = L_S$. Any additional employed wage earner would not produce additional output but he would be simply employed in recruiting additional recruiters without improving the resulting allocation.

2.5 Aggregate Demand and Supply

Taking the national account identity into consideration, the value of aggregate demand (*AD*) can be obtained by pricing at the current price level the sum between the real components of the aggregate expenditure. Hence,

$$AD = p(C + I). \tag{16}$$

Following the choice of units made by Keynes (1936) in the *General Theory* (Chapter 4, p. 41) and resumed by Farmer (2008a-b, 2009, 2010a-b-c), I use the nominal wage as numeraire. Therefore, taking into account of the results in (4) and (16) the value of aggregate demand in wage units can be written as

$$\frac{AD}{w} = L + \hat{I}. \tag{17}$$

[5] Whenever $\overline{U} = 0$ the corresponding point on the Beveridge curve is $\overline{V} = 1$.

where $\hat{I} \equiv (w/p)^{-1} I$ is the exogenously given investment expenditure measured in wage units.

The assumption that the investment expenditure is an autonomous component of aggregate demand formalizes in a very simple way a central issue of the *General Theory*, *i.e.* the idea that investment expenditure evolves exogenously with no regard for expected profits. By contrast, in this framework as well as in the *General Theory* the main driving force of investments is given by the state of long-term expectations, *i.e.* a latent variable that conveys the animal spirits of entrepreneurs (e.g. Keynes 1936, Chapter 12, p. 149). As a consequence, the determinants of this latent variable takes on a very special importance in the Farmer (2008a-b, 2009, 2010a-b-c) theoretical proposal.

Let me now turn to aggregate supply. In the *General Theory* (Chapter 3, pp. 24-25), Keynes (1936) defined the value of aggregate supply by having in mind the idea of entrepreneurs that compete one another for the production factors by means of price adjustments. As suggested by Farmer (2008a-b, 2009, 2010a-b-c), in a one-good economy the equation that triggers competition for labour factor is the FOC in (9). Therefore, if the nominal wage is chosen as numeraire, then the value of aggregate supply in wage units is simply given by

$$\frac{AS}{w} = \frac{1}{1-\alpha} L \cdot \tag{18}$$

The equilibrium condition for the goods market, *i.e.* $AD = AS$, provides the following solutions for the value of output in wage units and the level of employment:

$$\left(\frac{w^*}{p^*}\right)^{-1} Y^* = \frac{1}{\alpha}\hat{I} \text{ and } L^* = \frac{1-\alpha}{\alpha}\hat{I}. \tag{19}$$

Obviously, $U^* = 1 - L^*$ provides the corresponding rate of actual unemployment.

An interesting feature of the results in (19) is the multiplicative effect on the value of output played by the inverse of the capital share. Aggregate demand and supply in wage units are illustrated in figure 3.

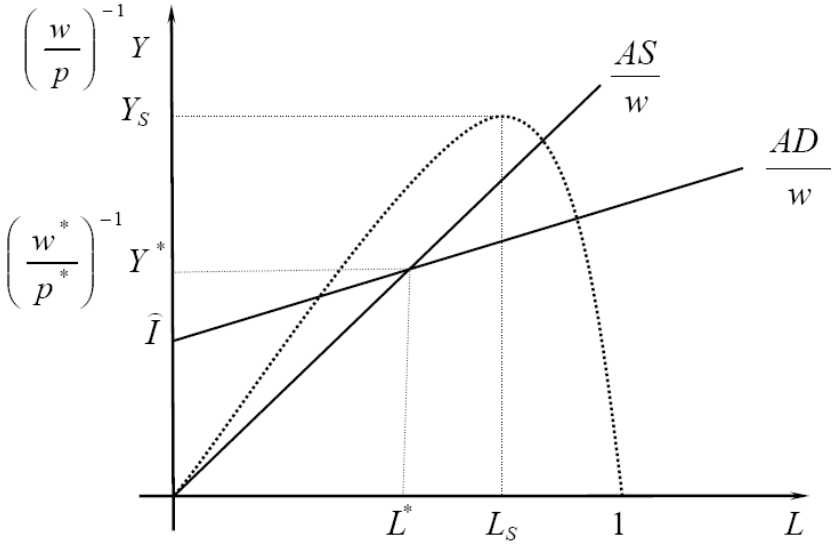


Figure 3: Aggregate demand and supply in wage units.

Considering the autonomous nature of the investment expenditure, there is no certainty that actual (un)employment coincides with its social-optimal level. For instance, the version of the Keynesian cross in figure 3 shows a situation in which actual employment is lower than the social-optimal level so that the model economy is experiencing inefficient and involuntary unemployment.[6] Moreover, it is possible to observe that the unit value of the labour supply and the results in (19) impose precise lower and upper bounds for the magnitude of the investment expenditure in wage units. Specifically,

$$0 \leq \hat{I} < \frac{\alpha}{1-\alpha} \cdot \tag{20}$$

The expression in (20) is straightforward. On the one hand, positive solutions for $(w^*/p^*)^{-1} Y^*$ and L^* are not consistent with a negative realization of $\hat{I}$. On

[6] As shown in Appendix, this framework can also be exploited to design balanced fiscal policies that successfully implement the social-optimal level of (un)employment.

the other hand, a value of $\hat{I}$ higher than $\alpha/(1-\alpha)$ would be meaningless because it will result in an equilibrium employment higher than the available labour supply. The combination of those results suggests that the investment expenditure – as well as the latent variable that drives its evolution – has to be constrained inside well-defined boundaries.

Finally, it is worth noting that in this demand-driven competitive search framework the Hosios (1990) condition works just as a constraint on the actual realization of $\hat{I}$. Specifically, whenever $\hat{I} = (\alpha/(1-\alpha))L_S$ the resulting equilibrium allocation is Pareto-optimal.[7]

2.6 Demand Constrained Equilibrium and its Wage Function

Now I provide a formal definition of equilibrium based on the building blocks outlined above. Following Farmer (2008a-b, 2009, 2010a-b-c), I exploit the term 'Demand Constrained Equilibrium' (DCE) in order to describe a demand-driven competitive search model closed by a balance material condition.[8] Hence,

Definition. For each $\hat{I} \in [0,(\alpha/(1-\alpha)))$, $A>0$ and $K>0$ a symmetric DCE is given by

(*i*) a real wage $\left(\frac{w^*}{p^*}\right)$;

(*ii*) a production plan $\{Y^*, V^*, X^*, L^*, U^*\}$;

(*iii*) a consumption allocation C^*, and

(*iv*) a pair $\{h^*, v^*\}$

with the following properties:

- feasibility and market-clearing in the market for goods:

$$Y^* = AK^{\alpha}\left(X^*\right)^{1-\alpha}. \tag{21}$$

$$L^* = X^* + V^*. \tag{22}$$

$$U^* = 1 - L^*. \tag{23}$$

$$C^* + \hat{I}\left(\frac{w^*}{p^*}\right) = Y^*\cdot \tag{24}$$

- consistency with the optimal choices of wage and profit earners:

$$C^* = \left(\frac{w^*}{p^*}\right)L^*\cdot \tag{25}$$

$$(1-\alpha)\frac{Y^*}{L^*} = \left(\frac{w^*}{p^*}\right)\cdot \tag{26}$$

- search market equilibrium:

$$h^* = L^*. \tag{27}$$

$$v^* = \left(\frac{L^*}{V^*}\right)\cdot \tag{28}$$

$$V^* = \left(1-U^*\right)^{\frac{1}{1-\gamma}}. \tag{29}$$

It is worth noting that in a DCE all nominal variables are expressed in money wage units and in sharp contrast with the competitive search equilibrium framework suggested by Moen (1997) no agent has incentives to change its behaviour even if L^* is different from L_S. Furthermore, the results in (21), (22), (23) and (29) suggest that the FOC in (26) can be alternatively written as

$$\left(\frac{w^*}{p^*}\right) = (1-\alpha)AK^{\alpha}\frac{\left(1-\left(L^*\right)^{\frac{\gamma}{1-\gamma}}\right)^{1-\alpha}}{\left(L^*\right)^{\alpha}}. \tag{30}$$

where $L^* \in [0,1]$.

The expression in (30) is the equilibrium wage function and shows that for any eligible equilibrium employment rate, a positive (negative) productivity (or supply) shock leads to an increase (decrease) of the corresponding equilibrium real wage. Moreover, consistently with the Cambridge theory of distribution, (30) suggests that $\left(w^*/p^*\right)$ adjusts in order to make coherent the employment level delivered by the equilibrium on the goods market with profit earners' employment decisions (*e.g.* Solow and Stiglitz 1968 p. 537).[9] Moreover, the results in (19) imply that

$$\lim_{\hat{I}\to\left(\frac{\alpha}{1-\alpha}\right)^-} L^* = V^* = 1 \qquad \lim_{\hat{I}\to\left(\frac{\alpha}{1-\alpha}\right)^-}\left(\frac{w^*}{p^*}\right) = 0 \tag{31}$$

[7] In the conventional search approach popularized by Pissarides (2000) the Hosios (1990) condition provides that the workers' bargaining power has to be equal to the matching elasticity with respect to unemployment.

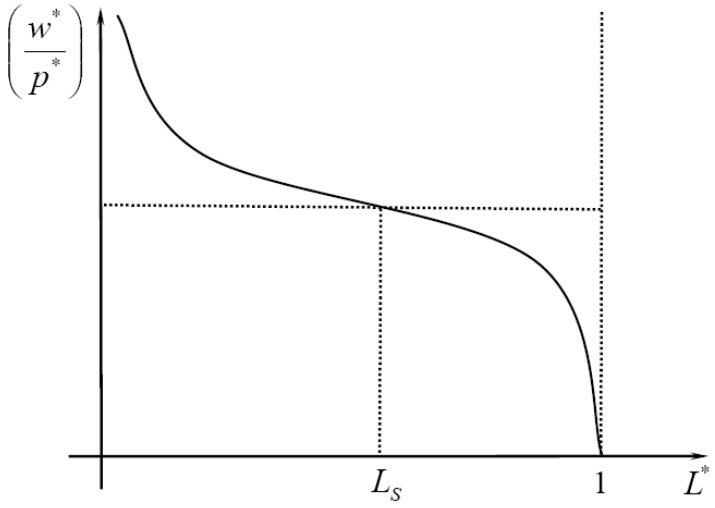
[8] The only common heritage with the fixed-price disequilibrium models developed (*inter alia*) by Benassy (1975), Drèze (1975) and Malinvaud (1977) is the Keynesian idea of effective demand.

[9] Specularly, the DCE real interest rate consistent with a zero-profit condition on profit earners' side would be equal to $\hat{I}\left(\frac{w^*}{p^*}\right)K^{-1}$.

$$\lim_{\hat{I}\to 0^+} L^* = V^* = 0 \qquad \lim_{\hat{I}\to 0^+} \left(\frac{w^*}{p^*}\right) = +\infty . \quad (32)$$

The expressions in (31) and (32) are quite simple. On the one hand, a full employment DCE, is characterized by the fact that there is no production while labour is a free-good. On the other hand, a DCE in which no wage earner is employed is obviously characterized by the absence of production. However, given that labour is so scarce, profit earners would be willing to pay a real wage that tends to infinity. The equilibrium wage function is illustrated in figure 4.

Figure 4. Equilibrium wage function



The diagram in figure 4 also allows to clarify some important features of the non-linear expression in (30). First, the equilibrium wage function is strictly decreasing and this suggests a quite conventional trade-off between real wages and equilibrium employment.[10] Second, for $L^* = L_S$ there is an inflection point in the equilibrium wage function. Specifically, whenever the actual realization of L^* is lower (higher) than L_S, the equilibrium wage function is convex (concave).

Reminding the social planner problem developed above and illustrated in figure 2, the reason why the inflection point of the equilibrium wage function coincides with the social-optimal (un)employment level is straightforward; indeed, equilibrium employment levels lower than L_S are associated with increasing total output because the employment of additional wage earners improves the resulting allocation at decreasing rates. Therefore, the average and marginal product of labour display the conventional convex decreasing path. However, beyond L_S total output starts to decrease because the employment of additional wage earners would not produce additional output but they would be simply employed in recruiting additional corporate recruiters. As a consequence, this leads the average and marginal product of labour to follow a decreasing concave path that quickly converges to zero.

The possibility of a turning point in the concavity of the equilibrium wage function is an intriguing feature of Farmer's (2008a-b, 2009, 2010a-b-c) demand-driven competitive search framework stressed for the first time by Guerrazzi (2010). This result implies that equilibrium employment rates next to L_S imply a quite flat trade-off between equilibrium real wages and (un)employment. Therefore, even if all agents are price-takers and prices are free to adjust, the model economy delivers an original possible endogenous source of real stickiness. A graphical description of a DCE is given in figure 5.

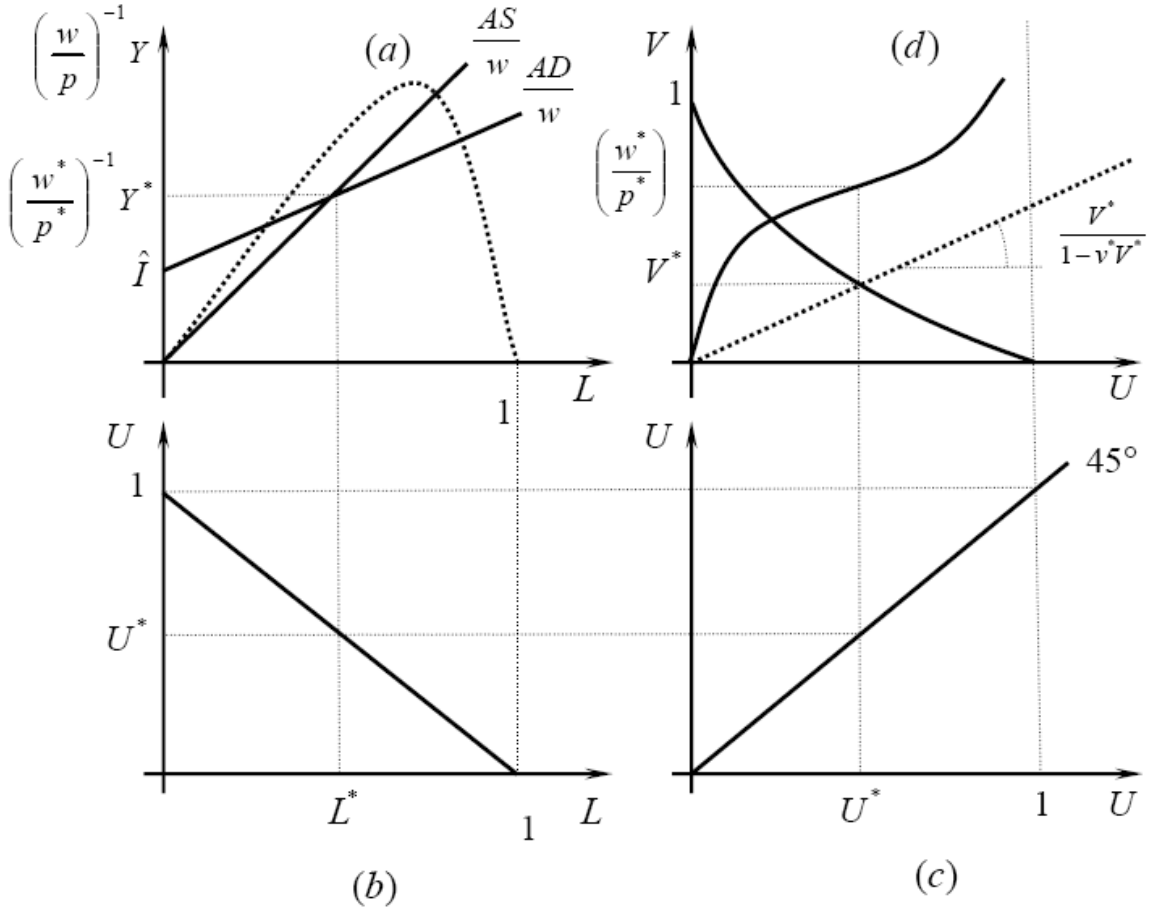
In panel (a) of figure 5 there is the equilibrium in the goods market. In panel (b) there is the one-to-one relationship between employment and unemployment. In panel (c) there is a 45-degree line. Finally, in panel (d) there is the Beveridge curve and the (mirrored) equilibrium wage function.

Observing the diagrams in figure 5, it is quite clear that – ceteris paribus – an increase (decrease) in the nominal expenditure in wage units, i.e. an improvement (deterioration) in the state of long-term expectations, leads to an increase (decrease) in employment and in the recruiters-unemployment ratio

[10] This model economy fulfils what Keynes (1936) in the *General Theory* (Chapter 2, p. 5) defined as the 'first postulate of classical economics'. As a consequence, the real wage is always equal to the marginal productivity of labour. Moreover, *ceteris paribus*, an increase (decrease) in employment is always followed by a decrease (increase) in the real wage.

and to a decrease (increase) of the equilibrium real wage.

Figure 5. Demand constrained equilibrium



3 Empirical Implications

Empirical contributions inspired by the new 'Farmerian' economics are still in their infancy. Two seminal attempts developed within this theoretical framework are Guerrazzi (2010) and Gelain and Guerrazzi (2010). In what follows, I provide a short summary of the empirical results obtained in both contributions.

First, calibrating and simulating a dynamic model economy very similar to the one described in section 2 with the aim of fitting the US first-moment data, Guerrazzi (2010) shows that the demand-driven competitive two-sided search framework put forward by Farmer (2008a-b, 2009, 2010a-b-c) is able to replicate the observed volatility and the pro-cyclicality of real wages as well as to provide a rationale for the so-called Shimer (2005) puzzle, *i.e.* the relative stability of labour productivity in spite of the large volatility of labour market tightness indicators.[11] The former result is obtained by assuming that the autonomous investment expenditure boosts capital accumulation while the latter is obtained by taking the corporate recruiter rate as a proxy of observed job vacancies. Both results appear quite strong and robust. Specifically, in Guerrazzi's (2010) paper the ratio between the volatility of labour market tightness indicator and the volatility of labour productivity matches the puzzling value of about 20 with a surprising degree of accuracy. Obviously, this computational result deeply relies on the special features of the equilibrium wage function illustrated in figure 4.

Finally, Gelain and Guerrazzi (2010) develop a DSGE model very close to the framework described in section 2. Specifically, relying on Bayesian techniques the paper by Gelain and Guerrazzi (2010) aims at providing a quantitative comparison between the US and the European labour markets. Two preliminary results outlined in this work deserve to be mentioned. On the one hand, the suggested DSGE model provides a very good fit of the US macroeconomic patterns over the last 45 years. On the other hand, using a filtered series for the EU job vacancies (corporate recruiters), the estimation of the respective matching elasticities seems to suggest that

[11] Similar results are obtained by Barnichon (2007) within a demand-constrained search model developed along the lines of the traditional matching approach popularized by Pissarides (2000).

the US labour market is slightly more flexible and more reactive than the European labour market. The former result suggests the New 'Farmerian' approach could outperform more conventional theoretical framework while the latter confirms the conventional wisdom according to which the European labour market is more rigid than its US counterpart.[12]

4 Policy Implications

The theoretical model developed in section 2 suggests that free-market economies may support any unemployment rate as an equilibrium phenomenon and that the observed equilibrium allocation is pinned down by the state of long-term expectations through the level of the investment expenditure carried out by profit earners. Moreover, as I shown in Appendix, a balanced budget fiscal policy would always be able to restore in one step the social-optimal level of (un)employment by eliminating the effects of any search and production frictions.

Despite of this interesting possibility, fiscal policies may be not the best way out from a situation of inefficient and involuntary unemployment because they would necessarily imply an increase in public spending. As suggested by Farmer (2010a-b), it is quite likely that most individuals would vote against an increase in public spending because they would prefer to directly choose how to spend their money rather than leaving this choice to the government. In Farmer's (2010b) words, "I do not deny that there is a role for government to provide public goods [...] but the percentage of GDP that a society devotes to government activities should not be changed in arbitrary ways to stimulate the economy during recessions" (Farmer, 2010b, p. 170).

The discussion about the effectiveness of monetary policies is more articulated. Actually, the model economy described in section 2 is not equipped to discuss traditional monetary policies because the monetary sector remains completely on the background of the analysis.[13] However, it is well known that this kind of policies provide for the management of money supply in order to affect the interest rate. On the one hand, in periods of expansion the central bank reduces money supply in order to increase the interest rate aiming at maintaining a stable value of the currency. On the other hand, in periods of contraction the central bank increases money supply in order to reduce the interest rate aiming at stimulating the economic activity.[14]

In conjunction of the current financial-induced crisis, Farmer (2010a-b) puts forward a new policy proposal by suggesting the advisability of extending the actual role of the central bank. Specifically, in a period characterized by low interest rates and low inflation, the effectiveness of traditional monetary policies such as those mentioned above appears seriously undermined; indeed, the price moderation prompted by the inflow of low-cost commodities coming from developing countries such as China and India favoured the creation of a macroeconomic scenario characterized by relatively low interest rates in many OECD countries. In such a situation, the performance of real world economies has been deeply influenced by the sudden and sometimes irrational fluctuations of price indexes attached to the stock and the housing markets (*e.g.* Shiller 2005). The fluctuations of those indexes are completely out of the control of the central bank and they are the main determinant of bubbles and subsequent disastrous crashes. In Farmer's (2009, 2010b) view, bubbles and crashes are events to avoid because they have a strong influence on the factors underlying the state of long-term expectations and – by this way – on the level of the economic activity. As a consequence, Farmer's (2010a-b) policy proposal provides to expand the role of the central bank in preventing financial and housing bubbles and stop crashes through the stabilization of prices in the respective markets. This task could be accomplished by selling and buying financial shares of an index found whose composition should ideally include all publicly traded stocks weighted by their market capitalization.[15]

The mere statement that the central bank stands ready to buy and sell at a fixed price should be enough to stabilize the market by preventing the self-fulfilling swings of confidence that in the current financial crisis were so important in determining recently observed economic outcomes.[16] Obviously, the actual possibility to carry out such a policy provides to solve the 'political' issue raised by the fact the central bank would find itself in the position to control the value – and sometimes the ownership – of private assets.

5 Concluding Remarks

This paper aims at providing a critical assessment of the New 'Farmerian' economics, *i.e.* the recent Farmer's (2008a-b, 2009, 2010a-b-c) attempt to

[12] In a recent work, Farmer (2010c) provides a monetary version of the framework presented in section 2 and shows that over the period 1952-2007 it fits US data better than its New Keynesian competitor.

[13] Augmenting the model economy with a market for money and assuming that the investment expenditure is a decreasing function of the interest rate would allow to reproduce a version of the IS-LM scheme.

[14] The symmetry of the effects produced by monetary policy shocks has been often questioned (e.g. Cover 1992 and Thoma 1994). Specifically, a restrictive monetary policy seems to be quite effective in moderating inflation during an expansion. By contrast, a policy of easy money sometimes is not enough to recover the economy in the afterwards of a recession.

[15] "The exact composition of the basket is not important. What matters is that it is known and fixed." (Farmer, 2010b, p. 172).

[16] In the long run, a by-product of this price stabilization policy should be the elimination or the strong reduction of the equity premium, *i.e.* the risk compensation for those who invest in venture capital.

provide a new micro-foundation of Keynes's (1936) *General Theory* grounded on modern search and business cycle theories. The task is carried out in three different steps. First, following Guerrazzi (2010) I provide and discuss a simple theoretical model that summarizes the main arguments of the suggested approach by showing that a special importance has to be attached to the search mechanism, the choice of units and 'animal spirits' modelling. A special emphasis is attached to the possibility of the resulting framework to generate a source of real stickiness in the neighbourhood of the first-best allocation due to a turning point in the equilibrium wage function.

Second, referring to self-made RBC experiments (e.g. Guerrazzi 2010 and Gelain and Guerrazzi 2010), I discuss the main empirical implications of the resulting framework. Such an empirical review suggests that the New 'Farmerian' economics has the potential to provide a rationale for the Shimer (2005) puzzle as well as to confirm the conventional wisdom according to which the US labour market is more flexible and more reactive than its European counterpart.

Finally, I consider the policy implications of the New 'Farmerian' economics by stressing the problematic nature of demand management interventions and the advisability of extending the role of the central bank in preventing financial bubbles and stop crashes through the stabilization of stock and housing market prices.

At the current stage, the major criticism that can be addressed to the New 'Farmerian' economics is that despite the stressed importance of the factors underlying the state of long-term expectations, a very little effort is devoted to understand the actual determinants of beliefs and market psychology. In other words, in Farmer's (2008a-b, 2009, 2010a-b-c) analysis expectations are assumed to drive the whole economy but they are treated as an exogenous factor without any attempt to provide a sound microeconomic explanation for their pattern and their actual transmission mechanism. Additional research on this topic is called in to fill the gap.

Appendix: Optimal Fiscal Policies

A DCE can be characterized by any employment level L^* in the closed interval [0,1]. However, in section 2 I shown that an omniscient-benevolent social planner who could simultaneously operate the production and the matching technologies would always choose an employment level equal to L_S. Therefore, unless profit earners' investment expenditure is consistent with the social planner solution, a DCE will be alternatively characterized by inefficient over or under employment.

In order to provide a remedy for those sub-optimal outcomes I follow Farmer (2010b, Chapter 4) and I augment the model economy of section 2 with a public sector responsive for fiscal policies. Specifically, exploiting the multiplier effect of changes in the autonomous components of aggregate demand, I assume that wage earners' nominal income is taxed at the proportional tax rate τ and subsidized with a nominal lump-sum transfer T measured in wage units. In this case, the value of aggregate demand in wage units becomes equal to

$$\frac{AD}{w} = (1-\tau)L + T + \hat{I} \cdot \qquad \text{(A1)}$$

The existence of a public sector can raise some problematic issues. On the one hand, government spending leads to the creation of public goods. On the other hand, deficit spending raises the issue of discharging the public debt.

In order to bypass those problems, I focus only on balanced budged fiscal policies. Therefore, I will be concerned only on fiscal policies in which the tax rate and the lump-sum transfer in wage units are linked in the following way:

$$T = \tau L \cdot \qquad \text{(A2)}$$

The expression on the RHS is simply the nominal revenue in wage units of the fiscal policy under examination.

Assuming that the public authority that designs the fiscal policy knows the social optimal level of (un)employment and that it is also able to observe the actual value of $\hat{I}$, then it becomes possible to derive a pair $\{\tau_S, T_S\}$ that successfully implements the social-optimal level of (un)employment through a balanced budget fiscal policy. Specifically, the equilibrium in the goods market at the social-optimum level of employment L_S implies that the social-optimal level of the proportional tax rate is given by

$$\tau_S = \frac{\hat{I}}{L_S} - \frac{\alpha}{1-\alpha} \cdot \qquad \text{(A3)}$$

Finally, the social-optimal lump-sum transfer in wage units is

$$T_S = \tau_S L_S \cdot \qquad \text{(A4)}$$

The social-optimal fiscal policy works as follows. Whenever the actual realization of $\hat{I}$ is too low (high) to support the social-optimum level of employment, the social-optimum balanced budget fiscal policy is implemented by a positive (negative) income tax and a positive (negative) lump-sum transfer in wage units.

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