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BETWEEN PIGOU AND KEYNES:  
CHAMPERNOWNE ON EMPLOYMENT AND  
EXPECTATIONS

by

MAURO BOIANOVSKY

CHOPE WORKING PAPER No. 2017-21

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## ***Between Pigou and Keynes: Champernowne on employment and expectations***

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**Abstract.** The paper investigates Champernowne’s 1936 attempt to sort out the debate between Pigou (1933) and Keynes (1936) about employment determination. Champernowne agreed with Keynes that workers can only bargain for a money-wage, but argued that, to the extent that workers’ (adaptive) price expectations lead to accelerating inflation or deflation, this will prompt central banks to change interest rates in order to bring the economy to its equilibrium (“basic”) unemployment rate, with real wages equal to their anticipated values. However, that mechanism will not work if general uncertainty (“nervousness”) prevails among businessmen.

**Key words.** Champernowne, Pigou, Keynes, employment, expectations

**JEL classification.** B22, B30

But employés [sic] cannot as a rule foresee; and they have less power of acting on their knowledge. The consequence is that a rise in wages is seldom or never as fast as that of prices when the cause of the rise is an increase of the currency, that is not accompanied by an increased command over nature. (Marshall, 1926; minutes of evidence to the 1899 Committee on Indian Currency)

### **1. Sorting out Cambridge expectations**

Alfred Marshall's 1899 brief remark about workers' lack of foresight, and its implications for the determination of money-wages, illustrated an opinion shared, but never articulated, by many economists during the Marshallian era. Indeed, workers' expectations are conspicuous by their absence in the then prevailing Cambridge approach to business cycles – advanced by the Marshalls (1879, pp. 152-55, with references to Lord Overstone and J.S. Mill) and fully elaborated by Frederick Lavington (1922) and A.C. Pigou (1927) – with its focus on waves of optimism and pessimism by businessmen. It was not just that workers occasionally held mistaken expectations, but that, unlike businessmen and dealers in the financial and investment markets, they could not foresee at all. W.S. Jevons's (1871) opinion about the inability of the working class to make intertemporal choices was representative of economists' widespread exclusion of "The Other" from their economic principles (see Dimand 2005).

Lavington (1922) argued that isolated "impulses" are "propagated" to the rest of the economy through cumulative "contagion of confidence". The errors of optimism affect directly and indirectly (through its influence on credit and therefore on prices) the estimates of future demand, especially in the investment sector. The prosperity phase ends when the gestation period of the new capital goods is concluded and businessmen realize that their actual yield is lower than anticipated, which is followed by errors of pessimism in the downswing. Pigou (1927), building on Lavington, assumed that short-periods shifts in the (discounted) demand for labour are caused mainly through changes in expectations of return. Variations in profit expectations are set off by impulses that may be of "real", "psychological" or

“monetary” kinds, which lead to the “mutual generation of errors of optimism and pessimism”. He rejected the argument that generalised errors of forecast are impossible in the sense that widespread wrong expectations about the movement of a variable are necessarily fulfilled through interaction between agents (see Kregel 1977; Collard 1996; Boianovsky 2005a).

Like other Cambridge economists before him, Keynes (1936) put expectations at the centre of his macroeconomic framework. However, he departed from the view that unemployment was a short-run disequilibrium phenomenon associated to economic fluctuations brought about by incorrect entrepreneurial anticipations. Keynes preferred model, for demonstrating the role of effective demand in the determination of unemployment in equilibrium, assumed away disappointments and shifts in expectations. In that formulation, the (general) state of long-term expectations, which decides investment demand, is given and irresponsive to (individual) short-term expectations, which are always realized. Regardless of how agents react to disappointed expectations, the economy moves immediately to the point of effective demand, which may happen at less than full employment for a given “state of the news” (Kregel 1976; see also Bateman 1988, chapters 4 and 5).<sup>1</sup> Just like Lavington and Pigou, Keynes focused on expectations by businessmen, without dealing in any detail with workers’ price expectations and their effects on labour supply decisions and money-wage dynamics.

Pigou and Keynes were both members of King’s College. One of the bright economic students at King’s in the early 1930s was David Gawen Champernowne (b.1912; d. 2000), who put forward in 1936 a path-breaking attempt to sort out the unemployment controversy between Keynes (1936) and Pigou (1933), just four months after the publication of the *General Theory*.<sup>2</sup> Champernowne’s mathematical gifts granted him in 1931 a mathematical scholarship to King’s, where he was supervised together with Alan Turing, the pioneer in modern computing. His incipient interest in economics, based on his reading of Marshall’s *Principles*, was confirmed by an encounter with D.H. Robertson at Cambridge, followed by J.M. Keynes’s

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<sup>1</sup> Disappointed expectations are, however, relevant for Keynes’s (1936, ch. 22) discussion of the business cycle (instead of equilibrium positions), which is reminiscent of the Lavington-Pigou tradition (see Haberler 1937, chapter 6 on “psychological theories”; Boianovsky 2005a).

<sup>2</sup> The following two paragraphs are based on Boianovsky 2017 and references there cited.

advice to abandon plans of becoming an actuary and turn to economics instead. Champernowne switched to the Economic Tripos by taking the Maths Tripos in double quick time, and by October 1933 started (together with B. Reddaway) studying under Keynes's supervision and attending his lectures about the forthcoming *General Theory*. His notes of Keynes's lectures would be used as one of the sources of T.K. Rymes's (1987; 1989) well-known compilation.

College supervisions formed the core of Cambridge's didactic system, which paid careful attention to the selection, education and relations with students (see Marcuzzo *et alii* 2008, with mention of several Cambridge economists but not Champernowne). The young Champernowne experienced Cambridge life intensively. He took part in the selective Cambridge Political Economy Club run by Keynes and became, probably under Keynes's guidance, a member and secretary of the Cambridge Conversazione Society, better known as the "Cambridge Apostles". The Apostles was essentially a conversational society, which required of its members that they be ready to question any established views. The 23-year-old Champernowne followed that strategy closely in his piece about "classical" and "Keynesian" approaches to unemployment, where he dared to challenge both Pigou (1933) and Keynes (1936), the only references mentioned in the article.

Although a student of Keynes, as a fellow of King's Champernowne was also in close contact with Pigou, as illustrated by his role – encouraged by Richard Kahn – in assisting Pigou (1938, p. 134) grasping the notion that the rate of interest is the mechanism through which changes in money-wages affect employment. Indeed, Champernowne (1936, p. 202) acknowledged suggestions from Pigou and Robertson on earlier drafts of his essay (Aslanbeigui and Oakes 2007). Throughout his long career, Champernowne enjoyed behind-the-scene refinement of ideas and enlightened commentaries on other economists' works (including famously his 1945 introduction to von Neumann), from which Pigou, Keynes, Robertson, Joan Robinson, Nicholas Kaldor, Piero Sraffa and other Cambridge economists benefited from the 1930s to the 1960s. Apart from that, Champernowne's main contributions were in the field of economic statistics (measurement of income distribution and inequality; and probability, decision making and estimation methods in economics). Champernowne (or "Champ", as he was known among his friends) held chairs at both Oxford and Cambridge universities, but even during his Oxford period (1945-1959) he kept close ties with Cambridge economics.

As discussed below, expectations formation by both businessmen *and* workers provides the key to Champernowne's (1936) effort to sort out the differences between Keynesian and Pigouvian analyses of unemployment. Workers' bargains for money-wages in labour contracts reflect their concern with anticipated real wages, with price expectations determined by prices of the previous period – that is, what we now call adaptive expectations. Unexpected changes of the cost of living bring about shifts of the “real supply curve for labour”, accompanied by employment levels above (if prices are rising) or below (falling prices) equilibrium. As workers became aware of price level movements, the rate of inflation or deflation accelerates, which leads to changes of the rate of interest by the central bank in an attempt to stabilize the economy. Workers' demand for a certain real wage is then made effective and unemployment converges to its equilibrium (“basic”) level, unless the influence of exogenous long-term expectations (the “state of the news”) on investment and money demand prevents the operation of the interest rate mechanism.

Champernowne described that last scenario as distinctively “Keynesian”. From his perspective, “classical” (Pigouvian) macroeconomics applied to the study of the “trend” values of real wages, output and other real variables in long-period full-employment equilibrium, with no relevant role for Lavington-Pigou short-run waves of pessimism and optimism. He would come back to that topic only once, almost 30 years later, on the occasion of the reprint of his 1936 article in the Lekachman (1964) collection. Together with other contributors who had also provided assessments of the *General Theory* in the 1930s and 1940s (J. Viner, G. Haberler, P.A. Samuelson, B. Reddaway, R.F. Harrod, among others) he was asked to “place in print [his] present evaluation of the Keynesian revolution”, as stated in Lekachman's preface. Champernowne (1964) was the only contributor who focused on the theme of expectations as the core of the Keynesian revolution, a fitting follow-up to his 1936 essay.

## **2. Labour supply and money-wage dynamics**

The “fundamental difference” between Keynes's *General Theory* and Pigou's *Theory of Unemployment*, pointed out Champernowne (1936, p. 201) in his opening paragraph, is that, while the former argues that the wage bargains decide the money-

wage only, the latter maintains that these bargains succeed in determining the real wage rate. This follows from Keynes's (1936, pp. 10-13) "fundamental objection" to the classical postulate that the real wage corresponds to the marginal disutility of labour (workers are on their labour supply curve). As put by Keynes (p. 13), "there may exist no expedient by which labour as a whole can reduce its *real* wage to a given figure by making revised *money* bargains with the entrepreneurs. This will be our contention". In order to assess Keynes's rejection of classical macroeconomics, Champernowne put forward a general equilibrium aggregative model, which, unlike Hicks (1937) better-known IS-LM formulation, highlighted the role of the labour market and pointed to the distinct causality structures and expectations mechanisms of "classical" and "Keynesian" frameworks.

Keynes's (1936, pp. 8-10; 12-13) first objection to the classical analysis of labour supply was not "theoretically fundamental" or logical, but factual, related to the "actual behaviour of labour". Based on his observation of collective bargaining by trade unions, Keynes criticized the notion that the influences of wages and prices on the decision to supply labour are symmetrical. A reduction of money-wages would lead to a withdrawal of labour, but a rise in the cost of living would not have the same effect, so that "within a certain range, the demand of labour is for a minimum money-wage and not for minimum real wage". Trade unions are essentially concerned with *relative* wages instead of the *general* level of real wages, he claimed, especially if price movements are "small".

Keynes (p. 275) was aware of Pigou's remarks that within some limits workers actually bargain for a given money-wage instead of a given real wage.<sup>3</sup> However, he charged his Cambridge colleague for assuming that this would not entail any significant change for (classical) employment theory, and for sustaining that (non-frictional) unemployment is caused by money-wage rigidity when labour demand fluctuates over the business cycle. Classical economists did not seem to realize, claimed Keynes, that, if labour supply is a function of real *and* money-wages

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<sup>3</sup> "To a great extent people – employers and employed people alike – think in money. Our income is our money income, and it requires an effort to realize that, provided the price of the things we buy with money has halved, we are really no worse off with a money income that is also halved ... Thus, except in periods with violent price oscillations, employers in general fight strongly against upward movements in money rates and workpeople against downward movements. Money wage-rates show themselves in practice highly resistant to change" (Pigou 1933, pp. 294-95).



(as admitted by Pigou), classical employment theory is indeterminate. For, “unless the supply of labour is a function of real wage alone, [the classical] supply curve for labour will shift bodily with every movement of prices” (Keynes, pp. 8-9).

Champernowne (1936, p. 202) read Keynes as stating that workers are “always” more conscious of changes in money-wages than in prices, perceived as a “generalization” of Pigou’s point that “sometimes” workers are concerned not only with real wages, but money-wages as well. He called it Keynes’s “first wave of attack” on classical analysis. However, Champernowne criticized both Pigou’s and Keynes’s assumptions about money-wage determination. Just like Keynes, Champernowne referred to his observations of workers’ actual behaviour, but argued that their concern with money-wages rather than real wages is only temporary, as “pointed out to me by Professor Pigou and Mr D.H. Robertson” (p. 202, n. 1). “Conversation with a representative wage-earner” had convinced him that it would be “ridiculous” to assume that workers are more interested in their money-wage than in their real wage. The observed lagged reaction to changes in the cost of living was explained by the existence of wage contracts “based on the expectation of a stationary cost of living”, transaction costs involved in contract changes, limited information about price changes, and “the habit of thinking in terms of the price level of some earlier date” (ibid).

Hence, the money-wage rate demanded by workers “today” is the rate that would give them a certain purchasing power “at prices ruling at some date in the past” (p. 203). Prices expected by workers today are those of an earlier contractual period, as expressed in the formula  $P_t^e = P_{t-1}$ , implicit in Champernowne.<sup>4</sup> This “Keynesian” labour supply function, as he called it, was described by  $N_s(Rw)$ , whereas the labour demand function was written as  $N_d(R)$ , where  $R$  and  $w$  are (actual) real and money wages respectively. There is no money illusion in the labour demand function, as producers are (implicitly) assumed to form correct price expectations:  $P_t^e = P_t$ . This corresponds closely to Keynes’s (1936, pp. 50-51) assumption that firms’ short-term expectations (of demand and prices) are correct, to the extent that “expected and realised results run into and overlap one another in their influence”. Such

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<sup>4</sup> Champernowne probably had in mind Robertson’s (1933) contractual setup, with the division of periods in “days”. See Boianovsky and Presley 2009.

asymmetrical price-expectations – which in part go back to Marshall – play an important role in Champernowne’s employment model.

Champernowne took account of Keynes’s criticism that Pigou had overlooked the shift of the labour supply curve when prices change, but reinterpreted it in terms of *expected* prices. As Keynes (1936, p. 276) pointed out, Pigou’s admission that workers demand a certain money-wage instead of a real wage means that the assumption that more labour is not available except at a higher wage, “which is fundamental to most of [Pigou’s] argument, breaks down”. From Champernowne’s viewpoint, that was relevant because a reduction in actual real wages, caused by prices going up faster than money-wages, was associated to an *increase* in labour supply, as workers’ *anticipated* real wages increased in the process. That was behind his concept of “monetary employment”, defined as the excess of employment beyond its equilibrium level. Such equilibrium – dubbed “basic unemployment” – could only take place if prices had been stationary and workers accordingly demanded the “basic real wage”. Symmetrically, “monetary unemployment” resulted from shifts of labour supply when the cost of living had been falling.

Champernowne’s unemployment typology cannot be found in Pigou or Keynes.<sup>5</sup> His notion of “monetary unemployment” was “copied from Keynes’s ‘involuntary unemployment’, but differed from that concept” (Champernowne 1936, p. 204, n. 1). While Keynes (1936, p. 15) described movements off the labour supply curve and situations of excess supply in the labour market, Champernowne depicted points of transitory labour market equilibrium corresponding to different positions of the short-run labour supply curve. Other young Keynesian economists, such as R. Kahn and Joan Robinson, were also critical of Keynes’s treatment of full employment and involuntary unemployment at the time, although they went different ways from Champernowne (see Boianovsky 2005b).

Referring to the *General Theory* as the “Bible”, Champernowne wrote to Robinson in 17 April 1936 – two months before his article came out – that “as for full employment the Bible says that there is full employment if there is not involuntary unemployment, which means that you can’t raise the cost of living and fool the workers into accepting a lower real wage, without causing so much strife that you end

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<sup>5</sup> Workers’ price expectations are not integrated into Keynes’s or Pigou’s labour supply functions (see Young, Leeson and Darity 2004, p. 11, for another view of Pigou).

up with less men employed than before. I will not commit myself further than this in interpreting the phrase". He announced that "what I want to discuss is how long you can expect the worker to overlook a rise in the cost of living or a fall in it; in order to do this I abandon involuntary unemployment and talk about monetary unemployment, which means unemployment due to the fact that workers behave as though the cost of living were higher than it is" (Joan Robinson Papers, King's College, Cambridge; quoted from Boianovsky 2005b, p. 77).

Keynes's notion of "full employment", as a fixed upper-limit described by the absence of "involuntary unemployment", is distinct from Champernowne's idea of "basic unemployment" as a long-run equilibrium position at which workers' price expectations are confirmed and money-wages do not tend to move. His "basic unemployment" is not an upper-limit, since the economy may be *above* that level if "monetary employment" prevails. As much as Keynes, Pigou (1933, 1941) too regarded full employment as a fixed limit. While arguing for the existence of a long-run tendency to full employment over the business cycle, he remarked that

This does not, of course, imply that *on the average* full employment ... exists. Since we know that employment is sometimes less than full, while it can obviously never be more than full, that would be nonsense. It means that ... employment on the average falls short of full employment by a certain quantity attributable to disturbances. (Pigou 1941, p. 79)

Again differently from Pigou and Keynes, Champernowne (p. 204) sustained that periods of monetary employment (unemployment) will be accompanied by rising (falling) money-wages, as workers realize that prices are changing and repair their "oversights" accordingly. Such movements of money-wages will eventually bring the rate of unemployment to its equilibrium ("basic") value provided *real* wages move in the same direction, which brings us to the core of Champernowne's modelling of the Keynes-Pigou dispute.

### **3. Monetary policy and the trend of real wages**

Keynes's "second wave of attack" on classical Pigouvian analysis was more persuasive than the first one, asserted Champernowne (p. 204). It consisted of the

“convincing demonstration” that the effect of a change in money-wages on real wages is indeterminate, unless its (indirect) impact on aggregate demand, employment and the marginal product of labour, through ensuing movements of the rate of interest, is ascertained. Whereas the “first wave” of attack came out in chapter 2 of the *General Theory*, the “second wave” was the theme of chapter 19 and its appendix on Pigou’s *Theory of Unemployment*. Keynes discussed how falling money-wages (and prices) might increase the real supply of money and, by that, diminish the rate of interest and encourage investment for given long-term expectations. Pigou (1933, chapter 10), on the other hand, denied that a cut in money-wages might bring about a corresponding fall of the cost of living, leaving unemployment and real wages unchanged. Instead, he claimed that a reduction of money-wages would reduce real wages as well and bring about a movement upward along the function of demand for labour (see also Cottrell 1994, p. 693).<sup>6</sup>

Instead of Keynes’s argument about excess supply of money – exogenously determined in the *General Theory* – Champernowne discussed changes in the interest rate by the central bank as a reaction to alterations in money-wages and prices. From Keynes’s second wave of attack, “it follows that the demand of labour for a certain real wage can only make itself effective in so far as it influences the attitude of the monetary authority and its manipulation of the rate of interest” (Champernowne, p. 204). The central bank’s reaction is prompted by the *acceleration* of inflation (deflation) in periods of “monetary employment” (unemployment). When the rate of unemployment is below its “basic” equilibrium level, money-wages increase and, unless real wages increase as well, prices will rise in the same proportion, with another round of rise of money-wages and so forth. The workers’ “bargaining power” becomes greater and the pace of revision of money-wage demands will become faster as they get “more accustomed” (p. 205) to the effects on real wages of the rise in prices – that is, to the extent that they revise their price level expectations in adaptive fashion.

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<sup>6</sup> As mentioned above, it was only later that Pigou (1938), with some help from Champernowne, grasped the interest-rate effect of changes in money-wages. In 1943 he would introduce the famous “Pigou effect” – so named by Patinkin (1965), who preferred the more comprehensive concept of “real balance effect” – as a reaction to Alvin Hansen’s “secular stagnation” hypothesis, when the interest rate mechanism is not operative.

Accelerating inflation puts pressure on monetary authorities to increase the bank rate of interest in attempt to stabilize the economy and bring the rate of unemployment to its “basic” value, as people become concerned that “there should be an inflation ‘like in Germany’” (ibid). There is some, not perfect, symmetry in the deflationary period of “monetary unemployment”. The fall in money-wages and prices becomes “accelerated”, but the pressure on the central bank to reduce interest rates and stabilize prices and output is not as strong, since agents’ “influential opinion” is supposed to be more concerned with the danger of a hyperinflation than with the “prospect of a slump ‘like they had in America’” (p. 206). This will not prevent the working of stabilization forces in the downswing, but will turn those periods longer than inflationary ones. Eventually, the economy converges to its “basic unemployment” rate – when the supply price of labour is the same as the demand price – which may be interpreted as the “trend” or long-run value of unemployment. Hence, “provided that the monetary authority does not allow labour to be misled by too long periods of rising or falling cost of living, the ‘real supply curve of labour’ may be a useful concept for estimating the *trend* of unemployment, real wages, rate of interest and saving” (p. 216). Champernowne apparently had in mind a Wicksellian price stabilization rule, with the bank interest rate converging to Wicksell’s natural rate of interest.<sup>7</sup>

Assuming the working of the convergence process to “basic unemployment”, classical Pigouvian analysis – of determination of *real* wages by supply and demand for labour – applied. The classical framework is relevant for the investigation of the trend value of unemployment under the assumption that on average monetary employment and unemployment even out in the long-term, but it “breaks down” when actual unemployment is considered. Trend analysis was reminiscent of the study of the classical stationary state, but with net investment going on. Champernowne (1936, p. 207) called it “dynamic equilibrium”, characterized by the confirmation of workers’ (and firms’) price level expectations.<sup>8</sup> Both Champernowne and Robinson (1937) were concerned with how to extend the *General Theory* to long-term equilibrium. “I think everybody is a bit puzzled about how to use Keynes’s book in

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<sup>7</sup> Since employment was also a matter of concern (particularly in the downturn), Champernowne’s description of monetary policy is perhaps closer to the later Taylor Rule.

<sup>8</sup> Which could only happen if prices were stable in equilibrium, as Champernowne did not entertain the notion of perfectly anticipated inflation (or deflation) rate.

studying a long run”, he wrote to Robinson in 2 April 1936. Champernowne argued for “a more sophisticated definition of equilibrium” as “a state of affairs in which some particular tendency has worked itself out completely”. A tendency relevant for his purposes was “the tendency for there to be an expansion of credit when there is a lot of unemployment, and a contraction of it when there is a boom; then there will be equilibrium when there is just a little unemployment. This is what I think the stationary state’s equilibrium ought to mean ... This would of course be a moving (dynamic) equilibrium ... [so that] one is likely to wobble on either side of it” (quoted from Boianovsky 2005b, p. 84).

Champernowne’s interpretation that Pigou’s employment theory featured a tendency to full-employment long-run equilibrium is consistent with other accounts (see e.g. Aslanbeigui 1992, p. 431), even if the equilibration mechanism through interest-rate changes cannot be found in Pigou (1933). Champernowne (1936, p. 211) represented Pigouvian macroeconomics by a system of causal equations, starting with labour market equilibrium:  $N = N_d(R) = N_s(R)$ . Real wages, employment and income are determined in the labour market. Next, the allocation of output between consumption and investment is decided by the equation of supply and demand of saving:  $S = S_d(r) = S_s(r)$ , where  $r$  is the rate of interest. Finally, nominal variables are determined by a version of the quantity theory of money:  $M = wH$ , where  $M$  and  $H$  stand for money supply and real money demand (in wage units) respectively. Champernowne (p. 208) observed that money supply is exogenous only within limits, since classical trends assume that the central bank follows a (Wicksellian) stabilization policy. Hence, “in the broader sense, the rigidity of the money-wage-rate determines the price-level and the demand money determines the supply” (ibid). Figure 1 provides a diagrammatic illustration of the classical system of equations and its sequential construction.

[Insert figures 1 and 2 around here; now at the end of the paper]

Champernowne’s “Keynesian system”, as suggested by his interpretation of the *General Theory*, tackles the determination of the same variables as the classical one (employment, real wages, real savings, interest rate, money-wages and quantity of money), but their “logical structures” (p. 209) are distinct. The starting-point of Keynesian employment theory is the determination of the rate of interest in the

monetary sector:  $M = M_s(r) = M_d(rQ')$ . The next step is to find the employment level, as decided by the supply and demand for saving (that is, the multiplier mechanism, which is only implicit):  $S = S_s(Nr) = S_d(NrQ)$ . The parameters  $Q$  and  $Q'$  capture the influence on money demand and investment of “general nervousness, the state of the news and effects due to the expectation of changes in the price level, etc.” (p. 211). Finally, the equations for the labour market determine the real wage and money-wage rates, as well the price level:  $N = N_s(Rw) = N_d(R)$ .

The sequential solution of the “Keynesian system” is, therefore, the opposite of the classical Pigouvian one, as depicted in figures 1 and 2, especially if “indirect effects”, such as the influence of income or employment on the Keynesian money demand function, are excluded. These and other “indirect effects” should be considered in a comprehensive general equilibrium representation of both systems, but that would make the distinction between Pigouvian and Keynesian macroeconomics less clear, as Champernowne (p. 211) pointed out. Unlike classical economics, the “Keynesian system” is able to account for “monetary employment” and “monetary unemployment”, even if those concepts – and the notion of workers’ adaptive expectations on which they are based – are, strictly speaking, alien to the framework of the *General Theory*. Moreover, the key issue, from Champernowne’s standpoint, was the logical causal structure of Keynes’s system.

Whereas Pigou took the determination of real wages in the labour market as the starting-point to find the (trend) employment and output levels, the *General Theory* started from effective demand in order to determine employment, output and real wages. In both systems, real wages are equal to the marginal product of labour (the “first postulate” of classical economics, which Keynes accepted), but the logic is essentially distinct, as stressed by Pasinetti (1974), Ambrosi (2013) and others after Champernowne. In fact, pointed out Skidelsky (1992, pp. 575 and 603-4), by working out the consequences of Keynes’s acceptance of the marginal productivity theory of wages, Champernowne became the “first ‘Keynesian’ to emphasize that the possibility of increasing employment by demand expansion depended heavily on workers not asking for higher wages as prices rose”. But Champernowne’s “Keynesian system” was not just about the labour market, as already suggested above and further elaborated in the next section.

#### 4. Keynes vs. Pigou on the role of expectations

Pigou's classical "trend" approach is valid provided monetary phenomena such as unemployment or extra employment due to changes in prices are temporary, so that workers' demand for a certain standard of living asserted itself. The Keynesian system would then apply strictly to the short-run only. However,

This [classical] method will be of no avail if outlets for investment are so scarce or if the employers are so nervous of any increase in the supply of money that they hoard, and it is impossible to lower the rate of interest sufficiently to cause sufficient investment to keep prices and money-wages from falling. (Champernowne 1936, p. 216)

Persistent "monetary unemployment" was, therefore, associated to the variables  $Q$  and  $Q'$  in the functions of liquidity preference and investment demand reproduced above. This reflected Champernowne's attendance of Keynes's lectures in the 1933 Michaelmas term, when the latter deployed a formalization of the general theory of employment by a system of simultaneous equations featuring the "state of the news" ( $W$ ) in the money demand and aggregate demand functions (Rymes 1989, pp. 122-28; Dimand 2007, pp. 85-88). Keynes (1936, pp. 198-99) did not repeat those equations in the *General Theory*, although he still used the term "state of the news" to express the change in the "weight of the evidence" or "confidence". Uncertainty (or "nervousness", as written by Champernowne) may be interpreted as the inverse of the "weight of evidence", a concept originated from Keynes's 1921 *Treatise on Probability* (see Brady 2017a).

That was a key aspect of Champernowne's 1936 modelling of the Pigou-Keynes debate. As he would recall in correspondence of November 1985 with Warren Young, while comparing his model to Hicks's 1937 IS-LM, "I was aiming to elucidate the relation of Keynes's new model with the Marshall-Pigou-Robertson type of model ... My emphasis was on the factors  $Q$  and  $Q'$  whose changes would shift the curves" (Young 1987, p. 85). Indeed, Champernowne (1936) was the only review article of the *General Theory* at the time that stressed expectations as one of its major features and integrated them into the equations (Brady 2017b). Patinkin (1990, pp. 212-13) inaccurately asserted that Champernowne belonged with other reviewers (Hicks, Lange, Lerner, Hansen, Harrod, Reddaway, Meade) who excluded uncertainty



from the main components of Keynes's 1936 book. In any event, as observed by Patinkin (pp. 217-19), it was only after George Shackle's articles and books in the 1960s (e.g. Shackle 1967) that the interpretation of the "central message" of the *General Theory* in terms of uncertainty and expectations started to gain some assent. That was also the time when Champernowne (1964) produced his second (sometimes critical) reading of Keynes, which elaborated on the variables  $Q$  and  $Q'$ , as well as on other "links between the economic future and the present", such as "marginal user cost".

Champernowne (1969, vol. 3, p. 80) was aware that Pigou and other Cambridge economists had ascribed business cycles to waves of optimism and pessimism. He contended, however, that it was not until the *General Theory* "that a *clear* account was given" of the effect of expectations on expenditure decisions and of how "a minor change in the 'state of the news' can play havoc" with the stock exchange and capital investment. Keynes (1936, p. 278) acknowledged that Pigou "speaks, it is true, of fluctuations in the state of demand, much as I do". However, when he came to formalize that notion, Pigou (1933) expressed it in terms of his "real demand function for labour", which was quite far from Keynes's notion of fluctuations in aggregate demand (*ibid*). Pigou's complex real demand for labour function assumed a two-sector economy with a wage-goods and a non-wage-goods sector. Its key feature is that it is employment in the wage-goods sector, determined in reference to a given real wage in terms of consumption goods, that is decisive, with the investment-goods sector adjusted to absorb the rest of labour supply. This is the opposite of the priority of investment demand in Keynes's framework. Hence, Pigou's labour demand function is essentially stable and unable to account for employment fluctuations over the business cycle (see Cottrell 1994; Keynes 1936, pp. 278-79). From that perspective, Champernowne's (1936) interpretation – that (long-term) expectations play no active role in the classical analysis of the employment trend – seems warranted:

The classical analysis can only take account of the forces  $Q$  and  $Q'$  considered in the Keynesian scheme by superimposing their effects on an equilibrium already found ... It is only in such a situation, if such can exist, where only basic unemployment matters, and where uncertainty and nervousness are not very important, that the classical analysis has the advantage over the Keynesian. (Champernowne 1936, pp. 212 and 216)

As mentioned above, Champernowne (1936, p. 211) included “expectations of changes in the price level” as one of the influences captured by the variables  $Q$  and  $Q'$ . Clearly, this refers primarily to price level expectations formed by businessmen in their investment decisions. The expectation of higher prices raises the schedule of the marginal efficiency of capital. “This is the factor through which the expectation of changes in the value of money influences the volume of current output” (Keynes 1936, p. 141). Workers’ price expectations are nowhere mentioned, let alone their possible influence on output. Likewise, Pigou’s (1933, pp. 241-43) chapter on “Reactions via expectations of price movements”, based on Irving Fisher’s (1896) notion of asymmetrical expectations between lenders and borrowers in the credit market, did not refer to workers’ price anticipations. However, as it is well known, Keynes (pp. 142-43) rejected on confused grounds Fisher’s hypothesis about the effects of price level anticipations on the nominal and real rates of interest. Champernowne (1964, pp. 199-200) would criticize Keynes for failing to “appreciate the truth of what Professor Fisher had in fact said”, and for suggesting “a ‘re-writing’ of Fisher’s theory which is quite nonsensical”. The Fisherian distinction between nominal and real interest rates, however, was not part of Champernowne’s 1936 models. The Wicksellian concept of market and natural interest rates, on the other hand, is implicit in Champernowne’s argument, as discussed above. Price expectations, of course, played a key role in Wicksell’s ([1898] 1936) cumulative process of price change, especially (but not only) by businessmen (see Boianovsky 1998).

## 5. The Champernowne puzzle

Champernowne (1959, pp. 263-64) put Pigou together with Keynes and Marshall as the main economists in the history of Cambridge economists. Pigou was Marshall’s pupil, and Keynes’s colleague and co-protagonist in a “one sided controversy”. However, he found Pigou’s training in mathematics inferior to that of Keynes and Marshall. Pigou “lacked Marshall’s passionate concern with practical and human problems” and Keynes’s “brilliance and intuitive sense for pick out the key relations in an economic situation”. The strength of Pigou, according to Champernowne (p.

264), consisted of his “sure grasp of logical relations and fanatical intellectual honesty”. Hence, had Pigou authored the *Principles of Economics* or the *General Theory*, “they might have been less attractive works, but there would have been far less ambiguity left for lesser economists to resolve”.

Champernowne apparently regarded himself as one of this “lesser economists”. His 1936 attempted solution of the Pigou-Keynes controversy remained relatively non-influential if compared to Hicks (1937), which dominated macroeconomic textbooks, especially after its restatement by Alvin Hansen in the 1950s. In correspondence, Keynes reacted positively to Hicks (1937) and other formulations of the *General Theory* as a general-equilibrium system of equations (Patinkin 1990, p. 213). There are no records, however, of Keynes’s reaction to Champernowne’s (1936) employment model. In April 1936, shortly after the publication of Keynes (1936), they corresponded about the argument of chapter 17 of that book, which Champernowne criticized (see Keynes 1973b, pp. 59-66).<sup>9</sup> However, Champernowne’s forthcoming review article, discussed in correspondence with Joan Robinson in that same month, is not mentioned. Pesaran (2004, p. 211) has suggested that Champernowne’s 1936 labour-supply function was a “courageous intellectual act that struck at the heart of Keynes’s argument” and “could not have helped Champernowne’s academic position in Cambridge economics”. True enough, Champernowne left Cambridge for the London School of Economics in 1936-38, where he worked with W.H. Beveridge, but returned as lecturer in statics in 1938-40, when his academic career was interrupted by the war. After the war, he became a fellow of Nuffield College and director of the Oxford Institute of Statistics. He went back to Cambridge in 1959 as Trinity fellow, until retirement in 1978.

Champernowne’s 1936 model failed to impress classical and Keynesian economists alike. Except for his “conversion” to the interest rate mechanism in 1938, Pigou did not show any signs of accepting Champernowne’s concept of “basic” unemployment. That differed from Pigou’s (1941) notion of full employment as an upper limit, deployed as well by Patinkin (1965) and others. This started to change with the entrance of the Natural Rate of Unemployment Hypothesis around 1968. Again, the striking similarities between Champernowne’s basic unemployment and

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<sup>9</sup> He would repeat and enlarge those criticism in his 1964 essay, pp. 194-99, especially in connection with Keynes’s contention that wages are necessarily rigid in terms of money.

Friedman's (1968) natural unemployment rates, with their emphases on workers' price expectations, went unnoticed until historians of thought (Darity and Goldsmith 1995; Darity and Young 1995; Boianovsky 2005b; Boianovsky 2018) discussed it.

Champernowne did not react to Friedman's natural rate concept. He was busy at the time completing his 1969 3 volumes on uncertainty and estimations, which tackled fundamental issues in Cambridge probability theory since Ramsey and Keynes. In fact, one cannot help wonder whether Champernowne's apparent lack of interest for Friedman's Presidential Address reflected the fact that his theoretical references came usually from Cambridge (or Oxford occasionally) academics, which he regarded as his audience as well. Be as it may, Champernowne (1969) followed a predominantly Bayesian approach to probability and decision making under uncertainty, which did not square so well with Keynes's approach. Indeed, Champernowne (1964, pp. 192-93) observed critically that the links between the present and the future in the *General Theory* are in one direction only. "Although Keynes has so much to say about the effects of expectations about the future on present economic behaviour, he seems to be not nearly so informative about the causation of these expectations". Champernowne did not feel comfortable with Keynes's treatment of expectations as exogenously given by "psychology and convention", despite their role in his 1936 assessment. Interestingly enough, that brought him closer to Pigou (1950), who acknowledged the importance of expectations in Keynes (1936), but criticized the apparent lack of explanation of how they are formed.

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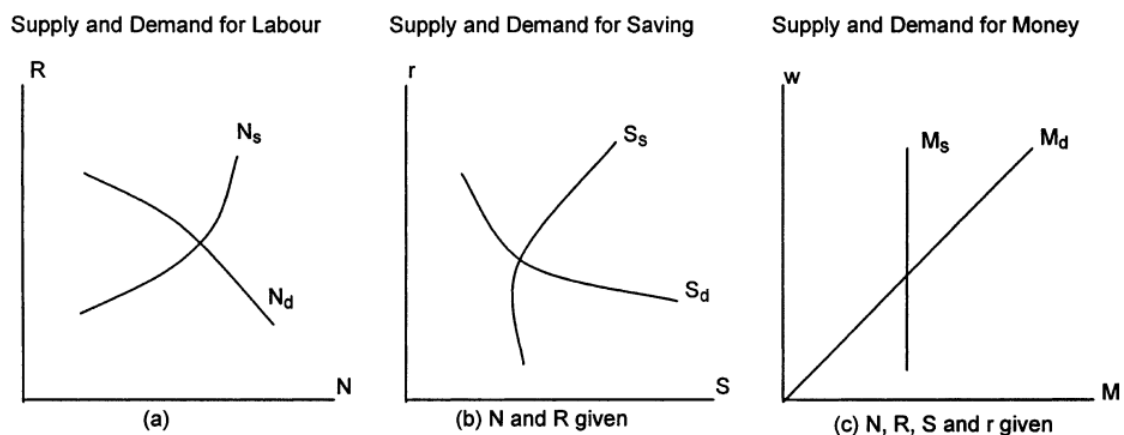
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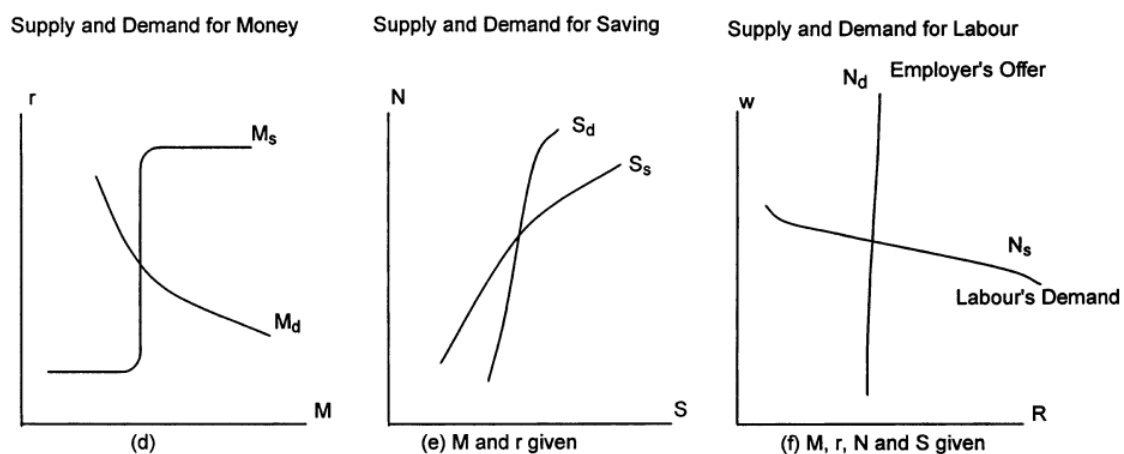
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**Fig. 1.** *Classical scheme.*  
*Source: Champernowne (1936, p. 212).*



**Fig. 2.** *Keynesian scheme.*  
*Source: Champernowne (1936, p. 213).*