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"Dennis Robertson and the Natural Rate of Unemployment Hypothesis"

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DENNIS ROBERTSON AND THE NATURAL RATE OF UNEMPLOYMENT HYPOTHESIS

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I. *Introduction*

One of the striking features of Dennis Robertson's 1915 *Study of Industrial Fluctuation* is the attempt to approach cyclical fluctuations in output and employment as the outcome of the rational reactions of producers to changes in real costs and demand conditions in market clearing economies. Throughout most of the book, Robertson uses the income-leisure choice - encapsulated by the concept of "elasticity of demand for income in terms of effort" - to show how sectoral real shocks (such as sector specific technological changes and/or an increased bounty of nature) are able to bring about changes in the supply of effort and, through that, produce aggregate fluctuations in output (see Fellner 1952 [1992], pp. 142-43; Danes, 1985, pp. 106-13; Presley and Sessions, 1997). It is one of the purposes of the present paper to discuss Robertson's extension of the income-leisure analysis to a monetary economy in the closing chapters of the *Study*. He put forward the view that a proportional rise in the price level and money-wages generates a temporary increase in aggregate output, as producers tend to mistake the nominal change for higher real wages and higher relative prices (and vice-versa for falling prices and money-wages). Robertson made it clear that the volume of production would return to its initial level as soon as the "illusion" was discovered.

This particular form of association between price and wage level changes and production can be found in some of his other books, but the theme gradually receded

into the background. This has to do in part with Robertson's decision to focus in the mid 1920s on the relation between the saving-investment process and the credit mechanism, but it also reflects the increasing attention given to money wage-stickiness in the period around the publication of J.M. Keynes's *General Theory*. Also in Cambridge, D.G. Champernowne (1936) suggested that the main difference between Keynes and the "classics" was the inclusion by the former of the nominal wage in the labour supply function, which was explained by the temporary inability of workers to fully realize changes in the price level. Despite Champernowne's acknowledgement of discussion with Robertson and A.C. Pigou, the notion that the supply of labour is a positive function of perceived real wages was not important for Robertson's interpretation of "Keynesian macroeconomics" in the 1930s and after (the same applies to Pigou, for that matter). Instead, Robertson discussed critically Keynes's claim that a reduction in nominal wages will not reduce real wages unless the rate of interest falls in the process.

During the 1950s Robertson became increasingly critical of the "Keynesian policy" of "full employment". He pointed out that the full employment policy of the British government was the main factor behind the process of "creeping inflation", which could quickly turn into an accelerating price rise. In several papers and in the third part of his *Lectures on Economic Principles*, Robertson maintained that if the government announced a stable price level as an objective of economic policy and fixed the money supply accordingly, money-wages would stop rising without any significant increase in unemployment, as trade unions would take monetary policy into account when setting new wage contracts. This point of view was incorporated into the first report of the Council on Prices, Productivity and Income (the "Cohen Council", of which Robertson was a prominent member) issued in February 1958, and elicited strong criticism from the trade unions and a few economists, especially Nicholas Kaldor. A few months after the report, A.W. Phillips's article on the statistical relation between unemployment and money-wages came out in *Economica*. In his reaction to Phillips's results in the following year, Robertson reaffirmed his view that a fall in aggregate demand, if anticipated by wage-earners,

would bring about a reduction in the rate of increase of money-wages, so that no massive increase of unemployment would be required.

Robertson's perspectives in the 1915 *Study* and in the 1950s on the neutrality of anticipated price level changes are clearly reminiscent of the "natural rate of unemployment hypothesis" (NRUH) formulated by Friedman (1968) and Phelps (1967, 1968) and further elaborated by Lucas (1972). The main proposition of NRUH is that inflation is neutral for the equilibrium path of employment and output, which, as Phelps (1995, p. 16) has pointed out, should be interpreted as a set of axioms instead of a substantive model of the determination of the level of employment (this can be illustrated by the differences between the models advanced by Friedman, Phelps and Lucas, among others).[1] The present paper sets out to discuss how the NRUH was deployed by Robertson at different stages of his extended contributions to business cycle theory.

II. *Money Illusion and Fluctuations*

Monetary factors are not considered in the *Study* until chapter three of the last part of the book. Robertson started by examining the influence of money during the boom, which had been previously described as an increase in investment determined by an upward "revision of the marginal utility of construction goods" (1915, p. 157).[2] Increased investment is accompanied by a larger money supply and higher prices, which induce producers to enlarge the scale of production beyond the point decided by the original effect of, e.g., an invention on the supply of effort.

> An increased volume of currency, whether due to an increased confidence in the breasts of bankers, or to an increased supply of metallic gold, will tend, it need hardly be argued, to raise the general level of prices. If all prices (including wages) were equally affected, the result would probably be a general increase in production beyond the point which is in fact more advantageous: for it seems to be a natural tendency of every man to suppose

that the product which he sells will be more rapidly and deeply affected by any current price-movement than the products which he buys either for personal consumption or for industrial use (p. 212; see also pp. 239-40).

Robertson illustrated his argument with a diagram, of the same kind used in the first, "real" part of the book (cf. pp. 132, 202 and 204). In the diagram, reproduced below as figure 1, "units of effort" are measured along the acscissa and "units of utility" along the ordinate. *EE'* is the "curve of marginal disutility of effort", while *AA'* and *A1A'1* are, respectively, the curves of "actual" and "anticipated marginal productivity of effort", prices having risen in the ratio *A1A : AO* (pp. 212-13). Because of the effect of the price level rise on anticipated marginal productivity, the total volume of effort expended will be *ON*, instead of *OM*, and total utility enjoyed will be *AONR*, which is less than total utility if marginal productivity of effort had in fact gone up (*A1ONQ*), but more than total utility at the original equilibrium (*AOMP*). The whole exercise is based on the crucial assumption - which is only implied by Robertson in this case, but is explicitly made in the "real" chapters of the *Study* - that the effort-demand for anticipated commodities is elastic, that is, the supply curve of effort (from workers and businessmen) is positively sloped (see Presley, 1979, pp. 41-45; Presley and Sessions, 1997; Robbins, 1930). This explains why the curve *AA'* shifts to *A1A'1* when the effort price of income falls (cf. Robertson, 1915, p. 132). Under this assumption, the (wrongly) anticipated increase of relative prices and real wages will bring about a larger aggregate output.[3]

Robertson was at pains to emphasise that the confusion between absolute and relative prices is temporary:

> So far as the gain from rising prices is purely illusory, the fact is bound sooner or later to be discovered: the anticipated productivity will fall till it corresponds with the real productivity of effort, and the volume of production suffer restriction. [Footnote: If, however, the working-class realisation of error occurs *after* the point at which the effort-demand for anticipated commodities becomes inelastic, it will very possibly set up a reverse movement towards an enlargement of production.] (p. 217; see also p. 240)

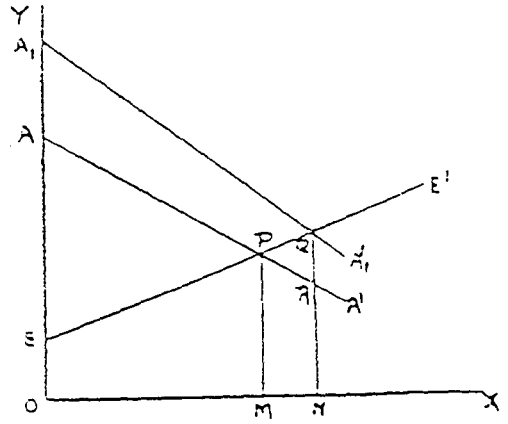

FIGURE 1 (Robertson, 1915, p. 212; units of effort along OX, of utility along OY)

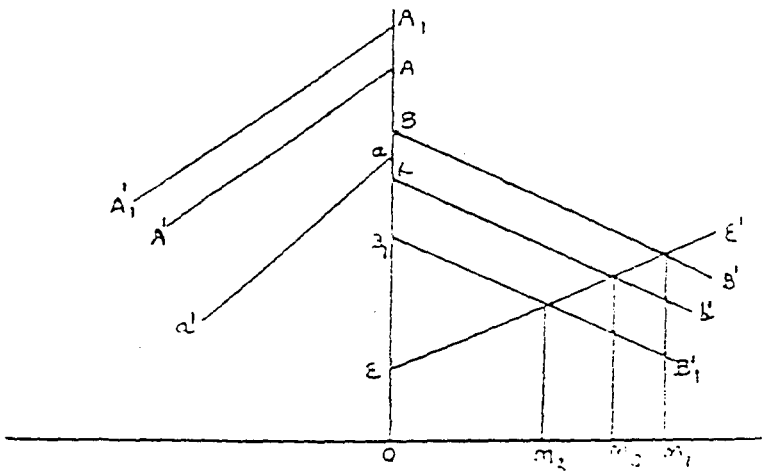

FIGURE 2 (Robertson, 1915, p. 217; units of effort along OX, of utility along OY)

The circumstances mentioned in the footnote were represented by Robertson in the diagram reproduced as figure 2 below. In the diagram, *AA'* and *aa'* are, respectively, the curves of anticipated and actual "commodity productivity of effort"; *BB'* and *bb'* are, respectively, the curves of anticipated and actual "satisfaction productivity of effort". Assuming that the further raising of *AA'* to $A_1A'_1$ lowers *BB'* to $B_1B'_1$ until it falls below *bb'*, production "having been restricted from OM_1 to OM_2 will on the realisation of error be expanded to OM_3" (pp. 217-18).[4]

After the upper turning point - usually explained by an over-production of fixed capital (see pp. 180-89; Goodhart and Presley, 1994, pp. 283-4) - the demand and supply of credit decline, bringing about a falling price level, with analogous effects on production: "This shortage of currency, combined with the influx of the new supplies of consumable goods, leads to a progressive fall in money prices. As the divergence between the real and the anticipated productivity of effort operated during the boom to stimulate production, so now it operates to restrain it" (p. 225; see also p. 241). It should be noted, however, that the analysis applies now basically to the supply of effort by businessmen only, as the increase in unemployment during the depression is interpreted by Robertson as "involuntary" (p. 209, n. 4), which he explained (apart from wage stickiness) by the fact that in those periods the elasticity of effort-demand for *all* commodities (including instrumental goods) is higher for businessmen than for workers. "For those reasons it is plain that the scale of production which commends itself to the business class may be smaller than that which commends itself to the working classes" (pp. 209-10; see also [1926] 1949, pp. 21-22).[5] Although Robertson stressed once more the "illusory" character of the disability imposed by a falling price level, he did not, in contrast with the upturn, make clear that the illusion would be only temporary.

Robertson (1915) also applied the notion of "monetary misapprehension" to the firm's inventory problem (pp. 156, 210, 241, 248). He was searching for an explanation of why during the business revival goods which had previously been held in store are put onto the market again.

> While a general rise in the exchange value of all consumable goods in terms of each other is clearly impossible, it is perfectly possible that each group of producers or owners should *expect* a rise in the value of its own products, and consequently be willing to withdraw them from store. Moreover, the existence of a monetary economy affords a mechanism by which such an expectation may be raised simultaneously in many trades (p. 156).

The accumulation in stores of a "considerable part of what is actually produced" during the depression was important in Robertson's 1915 framework for two reasons. The first one is that it diminishes the flow of goods available for the consumption of wage-earners, which prevents the rise in the commodity-productivity of their effort to an extent that the point at which their effort-demand for income becomes inelastic is not reached (p. 210). Moreover, the accumulation of stocks of goods was interpreted by Robertson as a main source of savings to be used later on during the boom (pp. 236, 248; but see his preface to the 1948 reprint of the *Study*, p. xv, for a change of opinion).

The effects of the confusion between absolute and relative prices on production can also be found in other accounts of the business cycle provided by Robertson (see *Money*, p. 139; *Banking Policy and the Price Level*, p. 39; *Lectures*, pp. 411 and 415), but the mechanism is not spelled out.[6] In his *Banking Policy* ... the matter was discussed as part of Robertson's distinction between "appropriate" (brought about by real factors such as inventions etc) and "inappropriate" (which are caused mainly by monetary factors and result in a subsequent reversal) fluctuations of output ([1926] 1949, chap. II and IV; Fellner [1952] 1992, pp. 143-44; Laidler, 1995, p. 156). He explained that a temporary rise of the price level should be part of the incentive to increased output when productivity rises in the boom, but that monetary and credit policy should avoid the "secondary phenomena of trade expansion" (and the symmetric "secondary fall") caused by a further increase of prices set up by a reduction in the demand for "hoarding" and by an enlarged demand for "short lacking" (short-term saving) out of proportion to the expansion of

output [(1926) 1949, chap. vi; cf. (1922, 1928) 1948, pp. 156-59, and 1963a, pp. 411-12).

> So far as the inducements to a producer to expand (or contract) output are clothed in the form of an increased (or diminished) stream of money demand, they are in many cases partly illusory: for the rise (or fall) in price turns out not to be confined to the product which he sells, but to affect also in greater or less degree the product which he buys. Hence, the alterations actually made in the scale of output tend to exceed the appropriate alterations ... also that monetary policy ... will tend to be, unless kept well in control, the most fertile in the generation of error. The aim of monetary policy should be ... to repress those [fluctuations in the general price-level] which tend to carry the alterations in output beyond the appropriate point [(1926) 1949, p. 39].

Despite the importance of "monetary misapprehensions" for the policy conclusions of *Banking Policy* ..., Robertson refrained from discussing the matter of "errors" in detail, on the grounds that "they have been so often and so thoroughly discussed" (p. 38). He referred to Lavington (1922) and to a passage from Pigou (1920, p. 840) about "psychological interdependence" between businessmen, but did not mention any discussion of the absolute price/relative price confusion in the literature, apart perhaps from a blurred reference to his own treatment in the *Study*.[7] As a matter of fact, however, the point about "monetary confusion" in the upswing had been made by J.S. Mill in his *Principles* and in a few other places. Mill [(1848) 1909, p. 550] reacted against Thomas Attwood's contention that periods of rising prices, produced by a rise of paper currency, had always been accompanied by increased employment of capital and labour (see Link, 1959, pp. 19-31, 149-51). Mill maintained against Attwood that,

> The inducement which, according to Mr. Attwood, excited this unusual ardour in all persons engaged in production, must have been the expectations of getting more commodities generally ... in exchange for the products of their labour, and not merely more pieces of paper. This expectation, however, must have been, by the very terms of the supposition, disappointed, since, all prices

> being supposed to rise equally, no one was really better paid for his goods than before. Those who agree with Mr. Attwood could only succeed in winning people on to these unwonted exertions by a prolongation of what would in fact be a delusion.[8]

As Negishi (1989, pp. 172-76) has pointed out, Mill's reasoning - that it is only while the "delusion" lasts that increasing money prices can produce an enlarged supply of effort and, by that, increased output - is fully consistent with the natural rate of unemployment hypothesis. Negishi suggests that producers and dealers will revise their expectation of "normal prices" in the face of changing realized prices until the delusion eventually vanishes (cf. Forget, 1990, pp. 630-31 for a rather different mechanism that also uses the notion of "normal prices").

Robertson did not refer to Mill in this connection, but the possibility of Mill's influence cannot be excluded, especially if we bear in mind the long lasting influence of his *Principles* on British economics (see also Laidler, 1995, p. 166, for the suggestion, on these grounds, that Mill could had been a source of inspiration for Robertson's analysis of forced saving in 1926). It is worth noting, though, that Mill did not explicitly consider the price expectations of workers.[9] Both Mill's and Robertson's formulations of the effects of "money illusion" on production in market-clearing economies are clearly reminiscent of the so-called "surprise supply function" advanced by Lucas (1972). Like Lucas, and in contrast to Friedman (1968), there is no asymmetry of information between workers and firms in Robertson's approach. Needless to say, the concept of "rational expectations", and the related notion that producers would be able to forecast the correct price level if they knew the money supply in advance, is not part of Robertson's (or Mill's) framework. Writing during the gold standard period, Robertson (1915, pp. 228-29) contends that the level of prices is decided by largely endogenous changes in bank credit, without a pro-cyclical pattern of the influx of new gold. He suggested that the effect of new gold at the final stages of the downturn is "purely sedative and medicinal", but pointed to a possible connection between gold supply and the expected price level:

> It is possible that the mere existence of large gold reserves and a low rate of discount leads people to *think* that prices are about to recover, and so to be less afraid first of buying other people's goods, secondly of consenting to *immediate actual* reduction in the price of their own, which they believe will only have to be temporary, and thirdly of making for stock (p. 229; italics in the original).

It was only in the 1950s that Robertson would put forward the view that information about future money supply is taken into account in new nominal contracts, especially in the labour market, as we shall see below.

III. *Money Wages, Keynes and Champernowne*

During the 1930s and after Robertson discussed extensively and critically Keynes's *General Theory*, with emphasis on the determinants of the rate of interest and the relation between money wages and aggregate demand. His previous analysis of "money illusion" was not mentioned, but the role of mistaken price expectations by wage-earners was the core of Champernowne's 1936 comparison between Keynes and the "classics". Champernowne (1936, p. 202, n. 1 and 2) acknowledged discussion with Robertson on the essentially temporary character of the wage-earners' mistake, but made no reference to Robertson's books. In any event, differently from Robertson (1915, 1926), he implicitly assumed that only workers are fooled by price level changes, while firms have correct information. Champernowne (pp. 203-4) distinguished between "basic" and "monetary" unemployment, where the former is defined as the rate of unemployment consistent with labour market clearing when the demand and supply of labour are influenced only by *real* wages. "Monetary" unemployment (or over-employment) is due, respectively, to the fact that workers have "overlooked a recent fall [or rise] in the cost of living".

> In so far as these oversights are likely to be repaired eventually, the monetary-unemployed are likely to lower the money-wage which they demand. We may express this by saying that a period of monetary unemployment is likely to cause falling money-wage rates, and that a period of monetary employment is likely to cause rising money-wage rates. In so far as we can assume that rising and falling money wages will respectively cause rising and falling real wages, we may conclude that a period of monetary employment contains the seeds of its own destruction in the form of a tendency for real wages to rise, whereas a period of monetary unemployment has in it the seeds of its own destruction, in the shape of a tendency for real wages to fall (p. 204).

Champernowne's interpretation of the dynamics of the labour market and his description of the essentially temporary "monetary" unemployment as "Keynesian" are remarkably close to Friedman's (1968; see also 1975, p. 17, for Friedman's interpretation of Keynes). He lacked, however, Friedman's notion that inflation would have to accelerate in order to maintain unemployment below the natural (or "basic") rate (cf. Champernowne, p. 216). In this framework all markets clear, so that workers supply an amount of labour decided by their perceived real wages. Deviations from the "basic" rate of unemployment arise from the temporary failure of wage-earners to form accurate expectations of the future course of the price level, and should be seen as "voluntary" (cf. Champernowne's equations and diagrams on pp. 211-13; see also Darity and Young, 1995, pp. 15-19). Like Friedman's, it is a model of departures of the labour force from its equilibrium path (cf. Phelps, 1995, p. 16).[10]

Robertson recognized the possibility of a "money illusion" interpretation of *The General Theory.* In his address on the "Frontiers of Economic Thought" to the Conference of Economic Teachers in 1947, he pointed out that

> The original Keynesian theory of employment hung, I believe, on the very old and respectable peg that there are strong frictions preventing money-wage rates from adapting themselves instantaneously to product prices, so that

> there is sometimes room for a little inflation, as I have a note of his [Keynes's] saying in a lecture 35 years ago, "to cheat Trade Unions into being reasonable". [Footnote: To which, if my notes are correct, in those days he was still cautious enough to add: "But this is a short-sighted policy, for the rise cannot be kept secret forever".] A respectable flag, but not a very strong one - not nearly strong enough, in modern times, to bear the weight of the idea, hung upon in the first book of *The General Theory*, that we can neglect as being "voluntary", and, therefore outside our main concern, any scraps of unemployment which may persist after money- wages have begun to follow price upwards. So all that had to go pretty quick, and it is not clear to me yet exactly what has taken its place (quoted by Mizen and Presley, 1995, p. 644).

Robertson suggested next that the "money illusion" factor had been replaced in Keynesian theory by the contention that "changes of money-wages, whether upwards or downwards, cannot affect employment except through the devious and uncertain route of the rate of interest" (ibid.; cf. Keynes, 1936, chap. 19). This is the theme of chapter 9 of part 3 of Robertson's *Lectures*, which result from his activities as Professor of Political Economy at Cambridge from 1945-6 until 1956-7. Robertson (1963a, p. 442) started by assuming what Pigou had called "Keynes's Day Of Judgment", that is, a zero (or almost zero) rate of interest, nil net investment and positive saving. If wages are "flexible without a lag", there would be no unemployment, contrary to the "Keynesian view" that the flexibility would not prevent a process of growing unemployment until saving falls as a result of reduced income. If money-wages are still flexible, but with a lag, some unemployment will emerge as a result of the fall in aggregate money demand, but the situation will be characterized by constant unemployment and continuous deflation, not by increasing "mass unemployment".[11] The progressive fall in money income will be interrupted by the endeavour by the community to restore the desired proportion between the real value of the money stock and real income (that is, the Cambridge *k*). In the general case, Robertson (1963a, pp. 444-45) rejected Keynes's claim that the schedule of

marginal efficiency of capital is given in terms of wage units and argued that falling wages would be followed by increased profit expectations.[12]

Robertson (pp. 446-53) applied the same reasoning to the symmetric case of excess demand for goods and labour. Assuming, as before, a given money stock, the process of raising prices and wages would be interrupted firstly by the attempt to restore the equilibrium value of k, which would be followed by the negative effect of higher wages on the marginal efficiency of capital. The ensuing contraction of the demand for labour would, under the assumption of a wage lag, lead to higher unemployment, and, through that, a suspension of the wage rising process. At this stage of the argument, Robertson ascribed the wage lag to the inability by wage-earners to realize that prices will stop rising in the future.

> How great that shock and jolt [to rising prices and wages] need be, and in particular how largely it takes the form of unemployment, *would* depend largely on the wage-policy of Trade Unions; and that is when good leadership from inside, and even ear-stroking from outside, would have a genuine part to play, namely, in inducing the Trade Unions to take their share of the medicine of stabilisation in the form of abstention from pressure for wage advances rather than in the form of unemployment (p. 450).[13]

As we shall see below, this was essential to Robertson's suggestions for monetary policy during the process of "creeping inflation" in Great Britain in the 1950s. He concluded in his *Lectures* that "there is not much left of the simpliste Keynesian doctrine that the level of employment does not depend at all on the level of money-wage rates" (p. 452).

In contrast with the "money illusion" mechanism put forward in the *Study*, the process of output and wage reduction described in the *Lectures* is a disequilibrium phenomenon. The wage fall is decided by the unemployment rate, under the assumption of a wage lag. This is in the spirit of Phillips (1958) and especially of Phelps's (1969) suggestion of how higher unemployment - caused by "expected wages" higher than "actual wages" - brings workers to revise their wage expectation and accept wage reduction as information comes in that actual wages are lower than

expected. According to Robertson (1963a), wage-earners would accept an immediate wage fall if they knew the money-wage level consistent with "full employment".[14] In the *Study*, the effects of a wage lag on employment were distinguished from the impact of proportional changes of wages and prices on the labour supply decision (Robertson, 1915, pp. 213-16 and 225-27). He considered that the "lagging of money wages behind rising prices is now so generally admitted as scarcely to require detailed illustration" (p. 215). Interestingly enough, the compound effect of the "money illusion" and the wage lag means that when wages do fall the depression becomes temporarily more intense, as prices fall under the impact of reduced consumption from wage-earners.

> It should be observed, however, that the final and most acute stage of depression tends to occur after a considerable readjustment of wage-rates has taken place (e.g. in 1878-9, 1886 and 1904): indeed the impulse given to production by the removal of the tax upon business men actually enhances the purely monetary and illusory inducements to restriction (1915, pp. 226-27).[15]

The labour supply function - which was prominent in the *Study* and is, of course, essential to the "natural rate" models of Friedman (1968), Lucas and Rapping (1969) and Lucas (1972) - is conspicuous by its absence in Robertson's macroeconomics from the 1930s onwards. His treatment of the subject in the second part of his *Lectures* (chapters 10 and 11) - which in part reproduces the conclusions of his 1921 discussion of "Economic Incentive" (cf. Robertson [1921] 1931, pp. 6-17) - shows how critical he became of the notion of a positively sloped labour supply curve. He started chapter 11 with a criticism of Keynes's (1936, pp. 5-6) application of the concept of a rising supply curve to the numbers of a given adult population, instead of the amount of work done by an individual (Robertson, 1963a, pp. 306-7; see also his correspondence with Keynes in Moggridge, 1973, p. 500). According to Robertson, the supply curve of the working population is vertical, except for a horizontal segment decided by the minimum acceptable real wage level.[16] Passing to the analysis of the labour-leisure choice by an individual, Robertson (pp. 145-48)

illustrates the argument with a diagram where utility appears on the ordinate and work on the abscissa, like his previous treatment in the *Study*. He discusses in detail the situation in which the "work-demand for income has an elasticity less than one", that is, a supply curve of work negatively sloped. For Robertson (as for Robbins, 1930, p. 129) the issue cannot be decided by *a priori* reasoning, but by empirical investigation only. After considering the evidence, Robertson (pp. 150-51) concludes that "in respect of both hours and intensity, the relevant stretch of the supply curve is backward rising, at any rate in the short period". The situation is complicated in longer periods by the fact that "leisure is apt to become boring unless you have money to spend in it, while given time the standard of wants is apt to adjust itself", which means that the labour-leisure choices may be reversed later.[17] Robertson's notion of a "natural rate of unemployment" as part of his perception of the working of the labour market in the 1950s will be dealt with next.

IV. *"Full Employment", Phillips and the Cohen Council Report*

Robertson (1963a, pp. 437-38) was critical of what he believed to be a "dramatisation" by Keynes (1936) of the contrast between "mass unemployment" on the one hand and "full employment" on the other. This "over-simplification" of the problem of economic policy objectives was rejected by him, since it is not possible "to draw a hard-and-fast line ... between what happens when there are unemployed resources and what happens when there is something more or less arbitrarily defined as 'full employment'; in the fashionable jargon of 1947, 'bottlenecks' may begin to appear at any stage in an industrial revival" ([1922] 1948, p. 205). His criticism of "full employment" as a policy goal was based on the inflationary dangers of a margin of unemployment smaller than the "transitional unemployment" associated with the transfer of labour from one sector of the economy to another ([1957] 1992, pp. 76- 7; see also Presley, 1979, pp. 240-41, and Danes, 1985, pp. 115-20). In the post-war period the employment problem took on a new form, namely

> Not how close an approximation to absolutely full employment should we aim at reaching, but how large a retreat from absolutely full employment - *over*-employment, as some of us have not hesitated to describe it - should we tolerate occurring ... Economically, it is in essence the same old problem as before - namely, how much slack does a modern economy require in order to avoid ossification of its industrial structure and a progressive undermining of its standard of value? (1963a, p. 438)

The notion of a rate of unemployment consistent with price level stability is behind Robertson's (p. 436) criticism of the 'apostles of full employment", as represented by the 1944 "White Paper" of the British government, by Beveridge's volume *Full Employment in a Free Society* and by the United States Employment Act (see Robertson [1957] 1992, p. 76; cf. Hutchison, [1968] 1992, pp. 26-27). His main piece on the subject was the 1955 article on "Creeping Inflation", written as a reaction against the widespread view that full employment could be obtained at the price of some low and steady creeping inflation. Robertson ([1955] 1966, pp. 247-49) sustained that the government's objective of "full employment" was the main determinant of inflation in the 1950s and distinguished three routes through which that influence worked to affect the price level. Firstly, it "encourages the maintenance of a swollen stream of monetary demand". Given the "extreme difficulty" of calculating the level of aggregate demand capable to absorb at current prices the output which would be forthcoming at "full employment", the tendency is for deviations to be concentrated in excessive monetary demand. In the second place, "this buoyance of demand in fact operates to diminish resistance to pressure from the side of work-people for higher wage rates". Finally, the "fear of creating pockets of unemployment" tends to hinder other government policies directed against monopolistic practices or barriers to international trade and the reduction of costs that would result from them (ibid.). Referring to S.H. Slichter of Harvard (see Leeson, 1997, pp. 473-81), Robertson pointed out that "the picture of the future which has formed itself in many thoughtful minds is that of a price level of final output which, in spite of a steady annual increase of some 2 or 3 per cent in productivity per head,

moves upwards on the average in at least a similar proportion ... 'Stability' almost seems to have been *re-defined* in terms of 2 or 3 per cent annual rise" (see also the Cohen Council report, pp. 29-30).

Robertson put forward two objections to that new notion of "stability". Assuming that the slow pace of the upcreep is tenable, a price-rise of about 3 per cent a year would not discourage the use of money for ordinary transactions, but long-term contracts would be affected. The attempts to protect these contracts from a future rise in prices, however, would turn the steady inflation into an accelerating one:

> It is at this point that doubts about the *merits* of the programme of slow uncreep coalesce with doubts about its *practicability*. For if its inequalities can only be softened ... by the excogitation of a whole battery of contracting-out devices, it is surely to be expected that these sections of the population who are at present the leaders in, and the beneficiaries of, the present comparatively dignified inflationary procession will all the time be endeavouring to preserve and restore their threatened leads. Thus in practice the rescue operations so carefully planned would probably be far from completely effective ... But what that means is that the planned orderly fall in the value of money would be in danger of turning into a landslide, generating not a conformable condition to "full employment" but a hectic and disorderly muddle, which could only be checked, at the cost of much disemployment and distress, by the re-establishment of drastic monetary discipline (pp. 252-53; see also his comments in Hague, 1962, p. 405).

This is reminiscent of Friedman's (1968) well-known "accelerationist" result, but the reasoning is not quite the same, as Robertson had in mind a heterogeneous society composed of groups with different abilities to act upon their inflation expectations. Robertson's conclusion that the "full employment pledge" (p. 255) is untenable led him to suggest long-term stability of the price level as the declared policy objective of monetary policy. He stressed that this would have to be accompanied not only by a "reasonable interpretation of the concept of 'full employment'", but also by the

recognition that "it may not be wise to regard the attainment even of an employment objective in itself reasonably conceived as in all circumstances the absolutely overriding aim of policy" (p. 256).[18]

The interpretation of British inflation put forward in the "Creeping Inflation" article became part of the first report of the Council on Prices, Productivity and Income, with Lord Cohen as Chairman and Harold Howitt (an accountant) and Dennis Robertson as members (cf. esp. pp. 24-25 and 29-31 of the first report, and Hutchison [1968] 1992, p. 137; for the circumstances surrounding Robertson's appointment to the Council see the "editorial commentary" in Robertson, [1959] 1992). Because of the goal of price stability, the crucial part of the report was the section on how to prevent rising money- wages without provoking an intense increase of unemployment. Robertson had discussed critically in an address to the School of Central Bankers in 1957 the prevailing view that a rate of unemployment around 10 per cent would be needed to prevent wage demands from exceeding productivity growth[19]. He maintained on that occasion that if trade union leaders and wage-earners in general became convinced of the seriousness of the government's commitment to price stability, money-wage claims would be substantially softened ([1957] 1992, pp. 77-8), which was repeated in the first Cohen Council report. After acknowledging a rise in the margin of unemployment to about 2.0 per cent (perceived by the Council as necessary for the "efficient working" of the economic system), and contrasting this with the dramatic forecasts of a rate of 10 per cent mentioned above, the report stated on p. 42 that no further unemployment would be necessary.

> We ourselves at present take a more optimistic view. The decline in the intensity of demand, working through a decline in realised and anticipated profits, must certainly be expected to stiffen the resistance of employers to claims for increased wage rates. It would be excessive optimism to hope that it would prevent any wage claims being made, but we believe that the decline in the intensity of demand will tend to moderate the insistence with which they are pressed and to convince the members of the Trade Unions concerned that

> a successful attempt to continue the spectacular rise of wage rates in recent years would not only involve real hardship for large sections of their fellow citizens but would also ultimately endanger their own future employment and standard of living (see also Robertson's comments in Hague, 1962, pp. 405 and 407).

Robertson had explained in an address on "The Role of Persuasion in Economic Affairs" that trade unions would not be convinced simply by "ear-stroking", a phrase he used to describe the attempt to establish a code by means of which someone becomes "aware of what is expected of him and behaves accordingly" (1956, p. 155). He praised the role of the "force of persuasion and convention", but at the same time stressed that it is "limited in supply" and that a "framework of monetary law and administration" should be created in order to make possible a "regime of incentives and disincentives, which will prevent these precious qualities of persuasiveness and persuadability from being wastefully squandered through being set tasks which it is outside their compass to perform" (p. 172).

The reactions by trade unions to the Cohen Council report were quite hostile (see Worswick,1962, p. 59). Howard Ellis (1958, p. 1040) expressed bewilderment with the strong criticism advanced by the Labour Party, as the report had rejected the theory that inflation could be ascribed directly to a wage push. The report's conclusion that the British inflation was predominantly "demand-pull" and not "cost-push" were confirmed statistically a few months later by Phillips (1958), which would soon become seminal. Robertson praised Phillips's study of the relation between unemployment and money-wages in an address delivered in 1959, despite some skepticism that Phillips's result - that the rate of unemployment consistent with price level stability is about 2.5 per cent - would apply to such a long period of time as a century (Robertson [1959] 1992, pp. 111-12; cf. his comments in Hague, 1962, p. 456, that "one could not put much reliance on [Phillips's] results because it assumed there was a fixed psychological function relating the attitude of trade unions to the level of employment over a whole century"). At the same time, he pointed out that if Phillips's econometric exercise (and others performed in the 1950s as well),

> Had been available to the Cohen Council twelve months ago, they would [not] have enabled it to modify very much the words in which, in the central passage of its report, it expressed, tentatively but fairly firmly, its hunch in this important matter. This was to the effect that the firm action which had been taken to catch hold of demand *would* be found to work its way through into the wage contract, and that whatever might be true of other countries and other times, it would *not* require enormous realised percentages of unemployment, but only a definite change of atmosphere, to take a great deal of the stream out of the wage push (p. 112; see also Robertson, 1961, p. 37).

The commentators (see, e.g., Ellis, 1958; Dow, 1958; Fellner, 1959, pp. 244-46; Samuelson, 1963, pp. 521-22; Hutchison [1968] 1992, pp. 137-38) on the first Cohen Council report missed its central message.[20] During 1957-59, the Chancellor of the Exchequer Peter Thorneycroft carried out a policy of disinflation and money-wage claims were below their earlier pattern, with only a slight increase of unemployment. The rate of unemployment, which was 1.4% in 1957, raised to 2.1 and 2.2 in 1958 and 1959 respectively, and fell again to 1.6% in 1960. Retail prices, which had grown from 100 in 1950 to 142 in 1957, reached 147 in 1958 and 1959, and went up to 149 in 1960. Nominal weekly wage rates, which had grown from 100 in 1950 to 154 in 1957, reached 159, 164 and 168 in 1958, 1959 and 1960, respectively (see Knowles, 1962, p. 536). Robertson (1963a, p. 451; see also 1963b, p. 23) had interpreted the experience of 1957 as "fairly convincing evidence, first that there *is* a clear link between monetary policy and the money wage level, and secondly that it doesn't require either tremendous sermonising or horrifying levels of unemployment to make that link effective, but only a reasonable amount of courage on the part of politicians and a reasonable amount of enlightened self-interest on the part of the leaders of organised labour". He further claimed in his Marshall Lectures delivered in Cambridge in October 1960 (which also contains a reply to Kaldor's charge of inconsistency)[21] that the events of 1957-8 had vindicated his view of the "rationality" of workers in preferring lower rates of increase of money-wages to higher unemployment, whenever they have the necessary information about monetary

policy: "In the hideous language of modern strategy, the deterrent has become credible because it has been used. It did not lead to social catastrophe - there was no good reason to fear that it would. But it was unpleasant, and even its warmest defenders would be delighted if there should prove never to be any need for its repetition on the 1957 scale" (1961, p. 38).

V. *Concluding Remarks*

Robertson's theoretical writings and contributions to debates on economic policy in his main books and in the 1950s show that he grasped what would later become known as the "natural rate of unemployment hypothesis" and one of its main corollaries, viz. that demand management cannot aim for the unemployment rate surmised as best. Even though his approach to the business cycle is quite far from the respective monetary frameworks of Friedman (1968) and Lucas (1972), it was clear to Robertson that price level changes would affect employment and output only if they were unanticipated. One cannot disregard the possibility of an influence on Friedman on this point, as the American economist worked alongside Robertson in Cambridge for part of the 1950s (see Mizen and Presley, 1995, p. 640, n. 2; cf. Friedman's [1969, p. 1] acknowledgment of discussions with Robertson on the "Optimum Quantity of Money"). In his memorandum to the Canadian Commission on Banking and Finance, Robertson (1963b, pp. 10-11) remained faithful to the view first put forward in his *Study* and elaborated in *Banking Policy* ... that the aim of monetary policy should be to generate a flow of monetary demand so as to "enable the participants in the growth process - enterprisers, savers and hired workers - to realize their intentions with a minimum of friction and of distortion of the true significance of the monetary contracts they are making with one another", that is, what he used to call "monetary equilibrium" (cf. 1963a, part III, chap. 2). His overall consistency throughout five decades - including the changes of perspective on points such as the labour supply function and its role in business fluctuations - on the

analysis of the relation between money, prices and output is remarkable in the history of twentieth century monetary thought.

Notes

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1. See also Leijonhufvud (1998, pp. 184-85), who maintains that, under the assumption of rational expectations but in the absence of perfect intertemporal coordination, the Phillips space would fill up with vertical Phillips curves, instead of collapsing to a single one. Phelps (1995, p. 17) refers to Lerner (1949) and Fellner (1959) as anticipators of the "neutrality axiom". Actually, the idea goes at least as far back as Wicksell ([1898] 1936); see Boianovsky, 1998.

2. Robertson (p. 157) listed three important causes of such a revision: the "confidence inspired by exceptionally good crops in the capabilities of a given country"; the "wearing out of an unusually large number of the instruments of production"; and "the occurrence of an invention in some important trade or groups of trades".

3. See also Bigg (1990, pp. 124-25) for a discussion of Robertson's diagram. Bigg's interpretation, however, is marred by his suggestion that Robertson's analysis is akin to Keynes's shifts in the marginal efficiency of capital and by his neglect of the concept of elasticity of demand for income in terms of effort.

4. Robertson (p. 207) suggested that the influence of the high value attached to leisure in the boom is particularly strong in the coal trade, where "the marginal utility of a 'straight back and the sunlight' is peculiarly high". He ascribed the lesser elasticity of the effort-demand of the working classes (when compared to businessmen) to the "more unpleasant and monotonous character of their work and to the greater urgency of their material wants". In another book, Robertson ([1926] 1949, pp. 19-20) assumed a hypothetical economy of independent producers with effort-elasticity between that of the actual employer and that of the actual employee.

5. Cf. his description of a trade slump as "a time of excessive and unwished-for repose, when factories work half-time and clerks sit twiddling their pens, when business men go to the South of France, or to Summer Schools, or to prison, and workmen tramp the streets striving to rid themselves of the blessing of Leisure" ([1923] 1931, p. 133; see also [1926] 1949, p. 21).

6. "Of course the stimulus of rising prices is partly founded in illusion. The salaried official and the trade unionist have been beguiled into accepting employment for a lower real wage than they intended. Even the business leader is the victim of illusion: for he is spurred on not only by real gains at the expense of his debenture-holders and his doctor and even ... of his work-people, but also by imaginary gains at the expenses of his fellow business men. It is so hard at first to believe that other people will really have the effrontery or the good fortune to raise their charges as much as he has raised his own" ([1922] 1948, p. 139). "To some extent this optimism is irrational - people are slow to realise that other people's selling-prices will rise as well as their own" (1963a, p. 411). The passage from p. 139 of *Money* was quoted by Phelps (1969, p. 157, n. 31) to support his notion that the firm will not raise its price in full proportion to the rise of the demand price for fear of worsening its competitiveness, with an ensuing rise of real wages and employment in disequilibrium.

7. The "surprise supply function" cannot be found in Pigou (see Collard, 1996, p. 919). Lavington (1922, chap. V) discussed the influence of changes in the price level on "business confidence", with no mention of the confusion between absolute and relative prices. Robertson ([1926] 1949, p. 3) was critical of basing business cycle theory on the element of "error". He objected in the *Study* to "those who find the causes of fluctuations in what they call 'psychology of the business man' and assume without further argument that they are incalculable and unfit for systematic study", and suggested that "it seems only natural, in the absence of proof, to give [the business man] the benefit of the doubt, and assume that they are in part at least induced, however irrationally, by external objective facts" ([1915] 1948, pp. 8-9).

8. This was one of the exceptions to Mill's famous proposition that "demand for goods is not demand for labour" ([1848] 1909, p. 87). Mill assumed, according to the classical tradition inaugurated by Adam Smith ([1776] 1976, pp. 99-100), that the supply of effort is a positive function of the real wage. See also Mill's ([1833] 1967, p. 191) statement that "an unusual extension of the spirit of speculation, accompanied rather than caused by a great increase of paper credit, had produced [in 1825] a rise of prices, which *not* being supposed to be connected with a depreciation of the currency, each merchant or manufacturer considered to arise from an increase of the effectual demand for his particular article ..."

9. Cf. Alfred Marshall's statement to the 1899 Committee on Indian Currency: "Employees cannot, as a rule, foresee; and they have less power to act on their knowledge" (1926, p. 284).

10. Champernowne's 1936 article was reproduced in Lekachman (1964), accompanied by another piece by Champernowne on his 1963 assessment of *The General Theory*. Champernowne's new article, entitled "Expectations and the Links Between the Economic Future and the Present", offers quite a different interpretation of Keynes's book.

11. Kohn (1981) drew similar conclusions from his loanable funds model incorporating the Keynesian income-expenditure mechanism in a Robertsonian sequence analysis. Assuming a production period of the same length as the period during which money is spent, Kohn shows that the joint assumption of wage stickiness (in the sense of the inability of money-wages to react quickly enough to clear the labour market within a single period) and a given interest rate generates persistent deflation with constant unemployment. The source of wage stickiness is not, in Kohn's analysis, the existence of wage contracts, which are set according to the production period, but the wage-earners' resistance to adjust money-wages in order to clear the market at the end of each production period. Robertson introduced wage contracts in his analytical monetary framework in 1933, under the assumptions that money-wages are "prevented by contract or custom from varying during such short periods of time" (Robertson's "day" during which the stock of money "changes hands") and that a decline in demand for goods is met only by a "reduction of prices sufficient to market the original output" ([1933] 1966, p. 49; cf. [1926] 1949, p. ix). His treatment of the "wage lag" in the *Study* is discussed below.

12. Robertson (p. 445) acknowledged in connection with the effects of wage reductions on profits that "once we begin to talk in terms of plans and expectations anything *may* happen" and suggested that the dangers of "wage flexibility promoting excessive instability" could be countered by combining wage reductions with expansionary policies like public works.

13. Wilson ([1980] 1992, p. 55) quoted the passage, without pointing, however, to the role of the wage-earners' information about monetary policy in preventing higher unemployment.

14. Robertson rejected Keynes's (1936, pp. 13-14) hypothesis that workers are primarily concerned with relative money wages (Moggridge, 1973, pp. 501-2).

15. Robertson (pp. 248-9) sustained (against Pigou) that there was some rationality in the Trade Unions's resistance to a falling level of money wages, as the demand for labour in the constructional industry is inelastic in the depression, which would cause a fall in the aggregate income of union members. Furthermore, the employer is for a "considerable time unable or unwilling to retaliate [to viscous money-wages] by curtailing unemployment" (see also Boianovsky, 1998, pp. 233-34).

16. See Aslanbeigui, 1992, who provides evidence that this was Pigou's notion of the aggregate labour supply function, and of Keynes's misinterpretation of Pigou on this point.

17. The supply of effort by the businessman - another important element of Robertson's *Study* - practically disappeared from the analytical framework of his *Lectures*. As he explained, "enterprise" is a composite factor of production combining work of a particular kind, provision of capital and exposure of that capital to risk (1963a, p. 104). The emphasis on the supply of effort by the businessman followed the form of business organisation dominant at the time of Marshall's *Principles*, that is, the ruling of the business by its owner. With the prevailing joint-stock form of organisation, business enterprise consists above all in the "bearing of uncertainty" (p. 265). Robertson concludes that "the supply of risk-taking by business men is likely to be a good deal more responsive to alterations in reward than the amount of skill or effort which they display" (p. 266).

18. The objection to full employment as a policy goal had been advanced by Robbins (1954; see Robertson's 1955 review in the *Economic Journal*, p. 107), but without any suggestion of the acceleration of inflation stressed by Robertson.

19. Harry Johnson (1956, pp. 19-20), for instance, sustained that "experience suggests that substantial unemployment would be required to prevent wages from increasing at an inflationary rate", and that the only solution to the overload on the

British economy "seems to be to stagger along under as we have been doing, meeting crises by a succession of temporary and regrettable expedients". In the same vein, David Worswick (1958, pp. 252-3) maintained in his memorandum prepared for the Cohen Council that "while trade union leaders might be deterred from wage demands if unemployment were 10 or 15 per cent ... they would hardly be deterred by a mere 2 or 3 per cent unemployed".

20. Fellner's interpretation is especially relevant, as he took expectations into account in his analysis of the inflationary process. According to Fellner (1959, pp. 227 and 234), in the case of "demand inflation" the reduction of aggregate demand flattens the price trend with only a temporary reduction of employment during which price-expectations are made non-inflationary. By contrast, in the event of "cost inflation", the reduction in aggregate demand would bring about a permanent contraction of the level of resource utilization. Fellner (p. 235) suggested that wage-push inflation would show an "*accelerating* tendency". The process starts by the attempt of some groups to gain at the expense of others in real terms, which is successful to the extent that the wage-and-price increases in some sectors "catch other sectors unawares". In the subsequent phase, "one must run fast in order to stand still". This is not far from Robertson's description of the acceleration process, but framed in terms of cost-push. Fellner sent a copy of his paper to Robertson, who criticised Fellner's definition of demand and cost inflation on the grounds that it mixed up "questions of the historical cause and remedial action" (Robertson, [1959] 1992, p. 109). Fellner (p. 245) was critical of the Cohen Council's conclusion that British inflation was mainly caused by excess demand and of what seems to him an ambiguity of the Council (see p. 41 of the report) on whether the increase of unemployment to ca. 2 per cent as a result of the restrictive monetary policy would be temporary or permanent. Fellner's complaint betrayed his inability to grasp Robertson's notion of an equilibrium (or "natural') unemployment rate.

21. Kaldor ([1958] 1989, pp. 457-59) used his model of the relation between distribution and growth to argue, in his memorandum to the Radcliffe Committee, that a small rate of inflation was necessary for full employment. Assuming that the required minimum rate of profit is 15 per cent, that the proportion of profits saved is 40 per cent and that the rate of growth of production is 3 per cent, the price rise would have to be 3 per cent a year (0.15 = 0.06/0.4) in order to keep the process of capital accumulation going. From that perspective, Kaldor (p. 459, n. 1) criticised the Cohen report and called attention to the section on "The Case for a Gently Rising Price Level" in Robertson's *Money* (pp. 138-40) as being inconsistent with the report. Robertson (1961, pp. 24-5) replied by criticising Kaldor's own model - on the grounds that the forced reduction of real wages through inflation is essentially transitory - and by claiming that his final conclusion in *Money* (p. 140) was in favour of price stability. Despite Robertson's attempted explanation, the fact remains that the *Money* section mentioned by Kaldor is hardly consistent with Robertson's overall analysis of inflation, especially if the reader is unaware (as Kaldor apparently was) that the whole case for a "gently rising price level" was built on the premise that the increase in prices "is not perfectly foreseen" (Robertson, [1922] 1948, p. 11).

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