Carl Föhl on Economic Activity and Money

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Abstract

Carl **Föhl**'s *Geldschöpfung und Wirtschaftskreislauf [Creation of Money and Economic Circular Flow]* was praised by **Schumpeter** (1954) and by other eminent economists to be comparable to **Keynes**'s *General Theory*. Yet soon after its publication it disappeared into oblivion. Although it had a second edition after World War II, its reception by no means corresponded to the above mentioned praise. Was this a loss for economic science? This paper argues affirmatively on two accounts.

Firstly, had the economic community been more aware of **Föhl**, it might have understood better the development of so called "post-Keynesian" macroeconomics. His book having been written before the *General Theory* was published, **Föhl** bases much of his argument on **Keynes**' *Treatise on Money* of 1930. On this analytical basis, **Föhl** comes up with virtually the entire apparatus of "post Keynesian" macroeconomics: be it now the IS-curve, the "Keynes effect" of wage changes, the liquidity preference theory of the rate of interest, the rebuttal of the "natural rate of interest" à la **Wicksell**. All these theoretical elements were later attributed to having been results of the *General Theory*. But they were developed by Föhl on the basis of a reception of pre-*General Theory* writings. Thus by tracing out Carl **Föhl**'s argumentation we might have a better understanding of the analytical basis on which **Keynes** himself progressed analytically.

Secondly, **Föhl** stressed microeconomic foundations in quite a different way than did **Keynes**. In this paper we tried to spell out his argumentation by going back to his references to Enrico **Barone**'s model of differential profits and to enlarge on his distinction between "expansion" and "substitution" as motives for investment. Even sympathetic critics of **Föhl** thought that this distinction is quite outlandish, as well as his doctrine that "profits swim on top of the rate of interest", the "Föhl effect" as we named it here. But in fact all these analytical elements may be seen to have a solid microeconomic rationale behind them. Not to have pursued further the analytical suggestions given by Föhl might therefore have indeed amounted to lost opportunities in the development of macroeconomics.

The paper also traces briefly Föhl's references to contemporary authors like **Neißer**, **Nöll von der Nahmer**, and **Grünig**. But to establish further these debates would have been beyond the scope of this paper. One side issue which we do follow up to some extent is **Föhl**'s relation to **Schumpeter**'s *Theory of Economic Development*. One of its undoubtedly helpful ideas for **Föhl** was **Schumpeter**'s doctrine concerning money creation as assistance to entrepreneurial development. Other elements in **Schumpeter** (his concept of circular flow of economic activities, his rebuttal of the quantity theory of money) were maybe inspiring for **Föhl** but they were of not much relevance for his macroeconomic approach and he did point this out quite clearly.

That in the end **Schumpeter** did pay the above quoted tribute to **Föhl** might be considered to be a sign of magnimity on his side — but it might also be seen as a sign of the quality of creative criticism on the side of **Föhl**.

1 Introduction

Monetary thought had a particularly fertile field for study in Germany between the two World Wars. Within ten years, between 1922 and 1932, that country went from a spectacular hyperinflation to the "most terrible deflation that any nation had experienced"[1]. Corollaries of these events were first the currency reform of November 15th 1923 which ended the inflation.[2] Then the introduction of a new gold standard for the mark in 1924 promised new stability. But, according to **Eichengreen** (1992), this was in fact a root cause for that "most terrible" deflation and depression just mentioned. After the economic catastrophe of the depression had run its course, the totalitarian catastrophe of Nazism had its sway. From 1933 on it brought not only political, but also monetary recklessness. A paradigm for the latter were the "Mefo–Wechsel", bills of acceptance which were introduced in 1935 by Hjalmar Schacht, then president of the Reichsbank. They were guaranteed by the government and discountable by the central bank. Through this instrument the state created new liquidity *via* short term credit which was not redeemed, however, but carried forwards year after year. Far from leading to monetary collapse, these money political machinations financed new, and in particular military, expenditures — but also economic growth. The splendor of the Berlin summer Olympics in 1936 seemed to herald long-lasting economic recovery. From 1933 to 1936 employment had risen by more than 4 million, *i.e.* from 13.4 million to 17.6 million. But the monetary system progressively deteriorated so that even Hjalmar Schacht himself protested. His protests were to no avail. He was dismissed from his position as head of the Reichsbank on January 20th 1939.[3] For completeness' sake let us mention the rest of the sorry history: On September 1st of 1939 the apex of political recklessness was reached with the beginning of World War II. It ended in the annihilation of the "Reich" that caused it. Its money was abolished on June 21 1948 by a new currency reform which became necessary due to the previous years of suppressed inflation.

In the middle of all this turmoil, around the year of 1935, Carl Föhl devised a scheme for monetary analysis which seemed to fit well into the economic events of his time.[4] It stressed the real effects of monetary expansion and seemed to mirror the experience of the German recovery in the middle of the 1930ies. Jørgen **Pedersen** (1957, p.3*) characterized the practical challenges dealt with in this book in the following way

> The immediate motive of Föhl's work is the discussion of the effects of the measures undertaken by the National Socialistic régime in Germany in order to combat unemployment. These measures consisted — as we all know — in large scale public works, tax remissions, subsidies to stimulate private employment, all financed by new credit, directly or indirectly extended, by the central bank.

[1] These were the words of **Keynes** (1932, p.366) who continues: "A visitor to that country is offered an extraordinary example of what effects of such a policy can be, carried out *à outrance*. . . . Nearly a third of the population is out of work. The standards of life of those still employed have been cruelly curtailed. There is scarcely a manufacturer or a merchant in the country who is not suffering pecuniary losses which must soon bring his business to a standstill."

[2] The extent of the antecedent hyperinflation may be gathered from the fact that one new "Rentenmark" was exchanged against the old paper marks at the rate of one to one "German" billion (= 1000 "English" billions = 10^{12} = one million millions). For a full discussion of the German hyperinflation see **Holtfrerich** (1980).

[3] All data in this context from **Ploetz** (1986).

[4] Published in an (unchanged) second edition in 1955 (**Föhl**, 1937b), his *magnum opus* was finished by December 1935, as **Föhl** (1937b, p.V) points out so that this book was written quite independently of the *General Theory* which was finished about the same time. For further details see the next section of the main text.

> By economists in all countries this policy was considered thoroughly unsound and bound to terminate in disaster. It was not denied that resource could be had to the central bank for the purpose of "prefinancing" additional investment, but if such preliminary financing was not followed by "genuine" saving by the people, it was held to lead to collapse of the monetary system. For years almost everybody with any authority was expecting such a collapse, but it failed to materialize. Now Föhl set out to explain why such a collapse did not take place and to discover the analytic errors which had led the false prediction as to the consequences. As is indicated by the title of the book "Geldschöpfung" or "money creation" therefore became the central theme of Dr. Föhl's book.

But the building blocks of his theory had little to do with the political life of his time. Although there are a few sentences referring to the contemporaneous employment political measures, Föhl's analysis is based on monetary theoretic elements taken from writings of Joseph Schumpeter and of Albert Hahn. But most of all Carl Föhl was inspired by John Maynard Keynes's *Treatise on Money*.

In this paper I first make a few remarks about Carl Föhl's biography (sect. 2). The main part of this paper (sect. 3 to 5) is an attempt to present those elements of his theory which, in my view, meet the criterion of showing a novel analytical approach which has interesting contemporary relations. This involves looking in some detail at Föhl's macroeconomic "Fundamental Equation" which is taken straight from Keynes's *Treatise* (sect. 3). It involves also to discuss his microfoundations (sect. 4) which Föhl developed with reference to Enrico **Barone** (1935).The outcome of this particular reception by Föhl is a seemingly strange list of entrepreneurial motives for investment. The apparent idiosyncrasy will turn out to be well founded in a choice theoretic reconstruction of the comparative statics of the demand for capital as a factor of production. It will be seen (sect. 5) that these elements are combined by Föhl in a monetary income determination scheme which is strongly reminiscent of Keynes's *General Theory*. Again we will point out Föhl's peculiarities in some detail. The outcome of these reconstructions has at least two aspects which should find particular mentioning because they lead beyond a narrow historical recollection of a particular author. One of these aspects is that our investigation of **Föhl** (1937b) shows the analytical potential which was contained in Keynes's *Treatise*, since this was one of the main inspirations for Föhl. The second aspect is that out of this inquiry it emerges what *could* have been in Keynes's *General Theory* but which was in fact excluded – it seems that it was even conscientiously excised – by Keynes from consideration. The final section of this paper will point out this latter point in some more detail.

2 Carl Föhl's life and work

Over the last decades, Carl Föhl has often been acknowledged to have been one of the most remarkable pioneers of monetary macroeconomic analysis in Germany.[5] He was was born on August 2, 1901 in Krefeld and died on February 19, 1973 in Koblenz. Before turning to economics, Föhl obtained a Ph.D. degree in engineering in 1930. It was only after a few years of successful work as an engineer investigating the efficiency of power stations which, incidentally, later won him a reward from the Society of German Engineers (VDI), that Föhl

[5] For tributes to Föhl by a number of the the most renown German economists of that time see Erich Schneider's *Festschrift* for Föhl (**Schneider**, 1966a). For a fuller treatment of his biography see **Ambrosi** (1997).

turned to economics. He enrolled at the Berlin Economic College ('Wirtschaftshochschule'[6]) after having first (!) finished the manuscript for his Ph.D. thesis in December 1935. On obtaining the degree in 1937, the thesis was published as *Geldschöpfung und Wirtschaftskreislauf* [Creation of Money and Economic Circular Flow]. It turned out to be a *magnum opus*. In reviews by H. **Peter** (1938), H. **Singer** (1955), and W. **Lautenbach** (1939)[7], it was much praised but subsequently it seems to have been little read. Had it not been for Joseph Schumpeter, who, in his *History of Economic Analysis* (**Schumpeter**, 1954, p.1174) explicitly recommended the study of this book as being "extremely instructive to American economists", it might never have seen a second edition as it actually did after World War II.[8] Schumpeter (*ibid.*) saw one of the merits of Föhl's book in its "apparently un-Keynesian approach". Reviewing the second edition of this book, Professor **Pedersen** (1957, p.1*) of Aarhus University considered **Föhl** (1937b) and Keynes's *General Theory* to be "equally important works" and was at a loss why the two books had quite different fates with regard to public notice. Further praise came from the long-time director of the prestigious Kiel Institute of World Economics, Erich **Schneider** (1966b). He considered this book as being "presumably one of the most magnificent dissertations ever written in Germany".

It is noteworthy that in spite of the high praise which **Föhl** (1937b) received from some outstanding academics, over most of his life he did not pursue an academic career. In 1939/40 he had a (minor) position in the Ministry of Economics in Berlin. From 1940 to 1945 he was director of a firm in Cracow, working for the German Solvay Group. I have no indication about any particular involvement of Carl Föhl with the politics of that time. For some time during the war years, in 1941, Föhl was guest lecturer at the University of Aarhus, Denmark. He was invited there by Erich Schneider and Jørgen Pedersen both of whom having taken great interest in his Ph.D. thesis of 1935. His Aarhus lectures were published and later they were praised by **Kalecki** and **Schumacher** (1946), the latter being one of the famous emigrés of Nazi Germany.

After the Second World War Carl Föhl continued to work as leading manager but from 1954 on he returned to academic life. First he was (part time) Honorary Professor of Economics at the University of Tübingen. In 1963 he finally became Full Professor at the Free University Berlin where he had the Chair for the Theory of Economic Policy. He won several honorary positions and academic honors. Thus, he was President of the German Association of Economists (BDVB) from 1961 to 1967. From then on he was Honorary President of that body. In 1967 the Economic College of St. Gallen (Switzerland) awarded him a honorary Ph.D. degree in economics. In his later academic life, Föhl became known to a wider public for two main new contributions to contemporary economic debates. One was a monograph on a *Circular Flow Analytic Inquiry into the Creation of Wealth in the Federal Republic of Germany and into the Possibilities of its Re-distribution* (**Föhl**, 1964). In this piece Föhl applied his previously cultivated circular flow approach to an analysis of economic political questions associated with the re-distribution of wealth and with taxation in the Federal Republic of Germany. In these enquiries he followed a theoretical line which in many respects was not dissimilar to the Cambridge Post-Keynesian theory of distribution

[6] This institution later became part of Berlin's present "Humboldt-University" and now hosts the department of Economics of that university

[7] In the preface to the second edition, **Föhl** (1955, p.XI) notes that Lautenbach thought along the same lines as himself.

[8] **Föhl** (1955, p.XI) himself traces the re-publication of his Ph.D. thesis to the interest which was taken in it by Jørgen Petersen and Erich Schneider in the 1940s.

associated with the name of Nicholas Kaldor. A further contribution to German macroeconomic debates of his time became known as the *Föhl-Theorem* (**Jürgensen**, 1966). This theorem states that under certain conditions taxes on profits will entirely be passed on to consumers (see **Föhl** (1953), **Föhl** (1956)).

3 The "Fundamental Equation"

3.1 Keynes's *Treatise* as Föhl's analytical starting point

As briefly noted above, Föhl's analysis is not so much inspired by his contemporaneous German discussion. The passage which is central for Föhl in this context – and in his judgement indeed for the entire future monetary analysis – comes from **Keynes** (1930, p.121) and reads:

> "I propose, therefore, to break away from the traditional method of setting out from the total quantity of money irrespective of the purposes on which it is employed, and to start instead . . . with the flow of the community's earnings of money income . . . "

Föhl (1937b, p.29) quotes this passage in the original English and continues by claiming that these words stand at the "threshold of a new epoch of monetary analysis" (my translation, GMA). He sets for himself the task to take Keynes more seriously with regard to this quote than Keynes did take himself and subsequently works out elaborate models of circular flows of income and expenditures in order to trace the course which newly injected money takes in the economic system. Schumpeter's just quoted observation that Föhl's approach is "apparently un-Keynesian" can therefore not be understood to mean that Föhl has *little to do* with Keynes. Quite to the contrary, **Föhl** (1937b, p.55) reproduces Keynes's (1930; p.124) "fundamental equation" nr.(viii), namely

$$Q = I - S \tag{1}$$

where $Q \equiv$ profits of entrepreneurs, $I \equiv$ the value of investment goods, $S \equiv$ savings and declares this equation to have indeed "fundamental significance" for any treatment of the phenomenon of business cycles. But he claims to have spotted some flaws in Keynes's argumentation and we will have to inspect whether this is indeed the strategic point of Föhl's departure from Keynes – if there was one in actual fact. Under the heading of "Investment and Savings", **Föhl** (1937b, p.54) re-creates Keynes's argumentation in an extended section in which he employs circular flow representations and algebraic manipulations, the latter reminiscent of Keynes's original presentation in the *Treatise*, but also critical of it in some regards.

3.2 The sectoral basis re-stated

Föhl extends Keynes's original argumentation by putting additional stress on sectoral disaggregation. But he is keen to give full credit to Keynes (1930) for the basic approach. **Föhl** (1937b, pp.60–61) states the sectoral profits in Keynes's original notation as Q_1 resp. Q_2, defining them in the consumption resp. in the investment goods sector as

$$Q_1 = V - V' \qquad \text{resp.} \qquad Q_2 = I - I' \tag{2}$$

where V resp. I stand for the value of sectoral production in the consumption resp. in the investment sector and where the corresponding dashed variables V' resp. I' stand for the corresponding factor cost.

Factor income E_f is the sum of sectoral cost. The recipients of factor income spend income either on consumption V_f or save it as S_f.[9] Thus we have the two equations

$$E_f = V' + I' \qquad \text{resp.} \qquad E_f = V_f + S_f \quad . \tag{3}$$

Total income E may be defined[10] in this context either a) as the value of total production, b) as the value of total consumption plus non-consumption, *i.e.* savings, or c) as factor income plus profits:

$$\text{a) } E = V + I \qquad \text{b) } E = V + S \qquad \text{c) } E = E_f + Q \quad . \tag{4}$$

It is clear that from a) and b) in equs.4 one could easily formulate

$$E - V = I = S \tag{5}$$

thus obtaining the $I = S$-identity which was the basis of Keynesian multiplier analysis.

It is significant that Föhl does *not* proceed in this manner straight away.[11] Instead, he sticks to the Fundamental Equation's fixation on profits and eliminates E in a) and c) of equs.4 [12], obtaining

$$Q = I - (E_f - V) \quad . \tag{6}$$

But how does this equation relate to Keynes's original one given by equ.1 above? Obviously, the two do not appear to be identical, since the terms in brackets in equ.6 are generally not the same as S in equ.1.

There are several ways of overcoming this difficulty. One is to assume a specific savings function, namely a "classical" savings function, as the later literature would name it. Under this assumption capitalists do not consume but just save and accumulate their profits. In this case just the recipients of factor income consume. Hence, in equ.6, we have $V = V_f$ and the bracket there is equal to S_f. We thus arrive at

$$Q = I - S_f \tag{7}$$

[9] In order to avoid misunderstandings for readers of the original text it should be stressed that Föhl does not originally use the subscript $_f$ when he refers only to recipients of factor income. But his verbal explanations are quite clear on this. **Föhl** (1937b, p.61) expressly defines the symbol "S" as the "formation of savings by the factors of production" (my translation, GMA. In the original it says: "Ersparnisbildung der Produktionsfaktoren"). Thus it is the same as the above "S_f".

[10] What was said in the last footnote applies here again: it is only in the preface to the second edition of his book that **Föhl** (1955) discerns between total income (E) and factor income (E_f) by means of a sub-index $_f$. In the original version Föhl makes the same distinction but uses the symbols $\mathcal{E}$ and E instead. Analogously, **Föhl** (1937b, *e.g.* p.275, n.113) uses the symbol $\mathcal{S}$ where we now use S and he uses S where we use now S_f. In the following text, we will stick to sub-indexed letters for signifying macro-economic variables when they pertain only to a particular set of economic subjects.

[11] In the later parts of his book, Föhl does revert to a detailed $I-S$–curve analysis, very much in the Keynesian vein. See below, sect. 5

[12] For the fixation on these two income accounting equations see in particular **Föhl** (1937b), p.71 where he verbally restates equ.4 c) and where he implicitly refers to equ.4 b), insisting that total savings consist of *two* elements: savings by factors of production and non-consumed profits.

and in this sense — limited by a specific behavioral assumption — we are approximately back at the starting point of equ.1.

Alternatively, and more generally, one may decompose $V = V_f + V_u$, where V_u is the consumption of the recipients of profits, and write for the bracketed term in equ.6:

$$E_f - V = E_f - V_f - V_u = (E_f - V_f) - V_u = S_f - V_u \quad . \tag{8}$$

Thus, after replacing $(E_f - V)$ in equ.6 by equ.8 and rearranging one arrives at

$$Q = I - S_f + V_u \tag{9}$$

as an alternative variant of Föhl's version of the Fundamental equation.

Equation 7 was Föhl's (1937b; p.61) original reformulation of Keynes's Fundamental Equation, whereas equation 9 was the version he professed to prefer in the second edition of his book (see **Föhl** 1955, p.XIII).[13] In any case, Föhl's approach preserves not only Keynes's original distinction between profits, investment, and savings. In addition, this approach also puts particular stress on behavior relations concerning V_f and V_u, be this stress now articulated through the classical savings function (underlying equ.7) or *via* the more general approach of a mere distinction of these magnitudes (see equ.9).

3.3 The paradigmatic circular flow

The significance of Föhl's disaggregated re-construction of Keynes's Fundamental Equation is that he wants to fix the analytical focus on the strategic variables determining macroeconomic activity. Very much like Keynes in the *General Theory*, he gives top priority to investment and to the monetarily determined interest rate. To do so is suggested already by the Fundamental Equation since investment is a prominent variable there. But such equations are tautologically true. Why should any one of their elements assume strategic explanatory relevance?

In answering this question in a particular way, circular flow analysis plays an important role for Föhl. This analysis is central for him for giving a first statement of the basic idea of his broader analysis, namely: even *if* one assumes that the economy is determined by given factors of production, it is only partially so determined – the final determination occurs through entrepreneurial demand, and in particular through investment demand. This basic idea is suggested by fig.1[14], using the assumptions of a determined volume of factor income (E_f) and of a "classical savings function". It is a significant aspect of this figure that it splits the circular flow of economic transactions into loops. The (double) lower loop in fig.1 depicts on its left-hand side the left-hand part of equ.3. On its right-hand side it depicts the right-hand side of equ.3 with the difference that due to our assumption of the "classical savings function" we have now $V_f = V$, *i.e.* total consumption expenditure is equal to the consumption demand of the recipients of factor income. If now factor income is given through endowment and contractually fixed rates of remuneration, the breadth of the

[13] It should be noted that in substance this variant formulation is not a creation of the second edition. Föhl discusses entrepreneurial consumption (represented by the symbol Q_v) at considerable length and with the help of a graphical representation first in the context of an extension of our fig.1 (*op.cit.*p.68, fig.15) and again when it comes to establishing his variant of the IS-LM curve (*op.cit.*p.271, fig.56). This analysis will be dealt with below in sect.5.2.

[14] It should be noted that for reasons discussed in footnote 10 above, we use in fig.1 the notation E_f and S_f instead of Föhl's original symbols E and S.

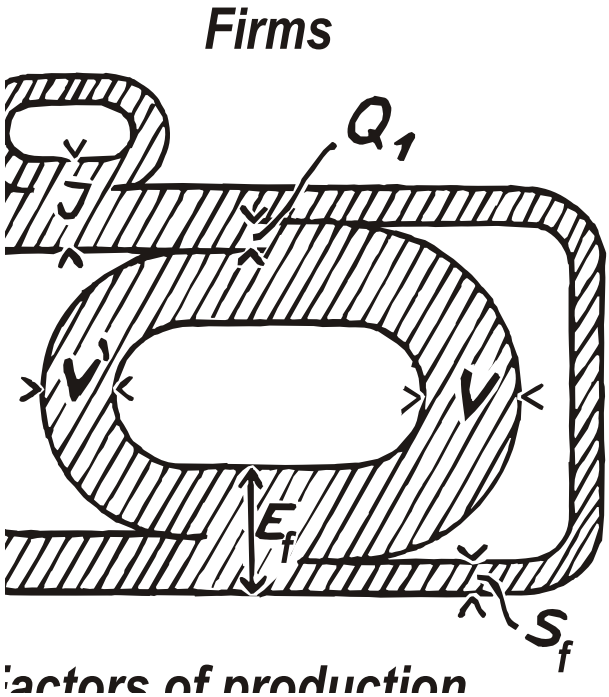

Figure 1: The Fundamental Equation as Circular Flow — "Classical" Savings

lower loop is fixed and hence it follows that on the right-hand side of the lower loop all the variables are determined as

$$\bar{E}_f = \bar{V} + \bar{S}_f + \bar{Q}_1 \tag{10}$$

If we now look at Föhl's variant of the Fundamental Equation as given by equ.7, it emerges that the final value of Q, and hence the total value of income, is determined by the considerations just made as

$$Q = \bar{Q}_1 + Q_2 = I - \bar{S}_f \tag{11}$$

except for Q_2 and I. These latter ones are the magnitudes represented in the upper loop of fig.1.

The particular significance of the two magnitudes thus visualized is that they either affect the decisions of entrepreneurs or they are affected by them. In any case, in this short–period setup it is the entrepreneurial realm which determines global economic outcomes in the last resort. In this way the splitting of the circular flow fixes the analytical attention on the fact that in this scheme it is entrepreneurs and their decisions concerning investment and profits which determines "fundamentally" the final working of the economy.

Thus it emerges in Föhl's framework that these two aspects of economic analysis must be in the center of any explanation of total economic activity: the theory of profits and the determinants of the volume of investment. The main task for Föhl is therefore to clarify these questions. It is in this sense that fig.1 is "paradigmatic". But it only *sets the stage* for an analysis. The particular analysis itself emerges from the microfoundation of the entrepreneurial decisions – to be inspected in the next section – and from the working together of the separately analyzed elements in a total macroeconomic system, the subject

of section 5 below. This is the basic analytical structure in **Föhl** (1937b). It means that conceptually, monetary analysis comes in only at a removed stage, namely in connection with questions concerning the financing of investment decisions. Thus the prime importance of money concerns the determination of the rate of interest. This emerged in more clarity from Keynes's *General Theory*. But the logic, if not the exposition, of Föhl's book is quite close to this aspect of Keynes's argumentation.

The similarity of the monetary analysis is probably somewhat blurred by the fact that the actual exposition in **Föhl** (1937b) pays much detailed attention to "the way in which changes in the quantity of money work their way into the economic system" as **Keynes** (1936, p.173) expressed the wider problem of monetary analysis. Föhl's endeavors to give a detailed analysis of the flows of newly created money and of money incomes are his tribute to Keynes's (1930) proposition to start in monetary theory with the flow of money earnings, a proposition which we referred to above in sect.3.1, p.6 already. But Keynes himself quickly abandoned that program. In the end, the *General Theory* has only one out of the total 24 chapters which expressly contains the term "money" in its title. But in Föhl (1937b) five out of eight chapters expressly carry the term "creation of money" in their title. The course taken by newly injected money in the entire circuit of the flow of payments is minutely followed by Föhl, and these contemplations are spiced with extensive references to contemporary and to past monetary thought. But those references, interesting as they are from a doctrine historical view, distract from the equally interesting question of comparing **Föhl** (1937b) with the basic Keynesian paradigm.

3.4 Föhl's criticism of Keynes's income accounts

In view of the observations just made, it must astonish that the reason for **Schumpeter** (1954) to commend a continued interest in Föhl's analysis was its apparently un-Keynesian character. An explanation for such a view might be sought in the fact that **Föhl** (1937b) repeatedly does indeed refer critically to details of Keynes's macroeconomic income accounting. One might therefore be led to expect notable differences between the two authors in this particular regard. A closer inspection will show, however, that much of the stated differences are only apparent. In the second edition of his book, **Föhl** (1955, p.XIII) by and large retracts this particular criticism against Keynes.

Formally, there is an obvious distinction in the treatment of savings as S resp. S_f between the original version of the Fundamental Equation taken from the *Treatise* and given above by equ.1 on the one hand, and Föhl's version of it as given above by equ.7 or equ.9 on the other hand. Dealing with this difference does *not*, however, require to attribute to Keynes the restrictive assumption of a "classical" savings function so that $S = S_f$ may hold. Instead, one may preserve total generality in this regard by either re-defining Q as being *net* of entrepreneurial consumption or one may change the specification of factor income and profits in order to bring in accordance the two ways of expressing the macroeconomic magnitudes. Actually, without changing much of the underlying macroeconomic theory of income determination, one may discard a separate appearance of profits altogether, as **Keynes** (1936, p.60) later explained in the *General Theory*. In short: the particular specification of variables does not depict in itself a fundamental difference in analytical approach, and Föhl later readily conceded this. The strategic elements of a macroeconomic model are the behavioral assumptions about the determinants of investment and savings, as both authors would agree.

The impression of definitorial and casuistic complexity which might arise in this context stems mainly from the fact that this discussion assembles

- income accounting equations
- behavioral assumptions and an
- income distribution theory

which are brought together into one complex theory of income determination. In order to appreciate more clearly the analytical relations between Keynes and Föhl, it might be helpful to go through this list.

Income accounting equations: These were given above as equs.4. The three versions stated there — notational differences aside — are equally relevant for Keynes as well as for Föhl. As stated in that context already, the main difference in this context is that the former — in his $I-S-$analysis — combines equs.4 a) and b), whereas Föhl puts more stress on equs.4 a) and c). But when it comes to determining the relation between income and the rate of interest, Föhl *like* Keynes resorts to $I-S-$analysis in order to generate the relevant analytical *locus*, as we will see when discussing fig.5 below.

Behavioral assumptions: Accounting equations are tautologies. They can give structure to an economic argument but "really scientific" *i.e.* falsifyable propositions are supplied by behavioral assumptions. It is in this realm that we must search for specific analytical traits. It is tempting to believe that Föhl, since he makes so much of circular flow analysis, must also have some holistic conception of economic behavior. It might therefore seem quite plausible when a commentator sees a contrast to Keynes in stating that Föhl "departs from the ground of a theory which acknowledges economic subjects only as decision making units" (**Hohn** (1970, p.57), my translation, GMA). There is no great difference between Föhl and Keynes in this particular regard, however. In any case, it will be seen in the next section, that with respect to entrepreneurial as well as with respect to household behavior, Föhl put utmost stress on microfoundations. As a final outcome of microanalytic considerations, Föhl's theory of consumption behavior as well as his theory of investment behavior is virtually the same as that of the *General Theory*.[15] Those differences which do emerge between Keynes and Föhl are attributable more to alternative assumptions concerning competitive conditions rather than to choice theoretic differences.

Distribution of income: It was seen above that Föhl's analytical starting point is Keynes's Fundamental Equation as represented by equ.1 above resp. by Föhl's variants of it given above by equs.7 or 9. But these expressions hinge on the concept and on the explanation of a specific income category, namely profits, while the rest of the incomes, namely factor incomes, are considered as given. Thus, the Fundamental Equation addresses the object of enquiry, namely macroeconomic income and employment, in a rather indirect way. Indeed, it is not at all obvious that such a setup should generate a general macroeconomic theory of income determination. It is therefore understandable that before reaching that stage of the analysis, Keynes *and* Föhl make detours into distributional considerations. A good case in point is Keynes's (1930; p.125) doctrine of the "widow's cruse".

> "There is one peculiarity of profits (or losses) which . . . is one of the reasons why it is necessary to segregate them from income proper, as a category apart. If entrepreneurs choose to spend a portion of their profits on consumption (and there is, of course, nothing to prevent them from doing this), the effect is to

[15] See also **Müller** (1981) for an assessment in this sense.

increase the profit on the sale of liquid consumption goods by an amount exactly equal to the amount of profits which have been thus expended. [see the corresponding difference quotient in equ.12 below,GMA] . . .

Thus profits, as a source of capital increment for entrepreneurs, are a widow's cruse which remains undepleted however much of them may be devoted to riotous living."

If we analyze Föhl's manipulations of the Fundamental Equation, it will appear that they involve not so much *criticism* of Keynes but rather an *elaboration* of this very passage. This emerges if we turn once more to the algebraic formulation of Föhl's version of the Fundamental Equation as given by our equ.9. Under conditions of fixed factor incomes and given investment we obtain:

$$Q = I - S_f + V_u \qquad \text{with} \quad \frac{\Delta Q}{\Delta V_u} = 1 \quad \text{for} \quad I = \bar{I}\ ,\ S_f = \bar{S}_f \quad . \tag{12}$$

Thus, as the difference quotient shows, entrepreneurial profits are augmented by whatever this class decides to additionally consume. Föhl seems to have been rather fascinated by this implication of the Fundamental Equation. In the article presentation of his dissertation, **Föhl** (1937a, p.641) states total profits not as $Q = Q_1 + Q_2$ but as $Q = Q_1 + Q_2 + Q_v$ where he seems to use $\Delta Q = \Delta V_u$ as stated by equ.12 *together* with the assumption that previous entrepreneurial consumption Q_v was zero. This latter assumption is not quite consistent with his more general definition of the Fundamental Equation which attributes a non-zero value to Q_v (see footnote nr.13). Consequently Föhl abstained from this way of decomposing profits. Nevertheless, this initial formulation is interesting because it reveals the fascination which the "widow's cruse" –implication of the Fundamental Equation did have for Föhl.

We note that these manipulations demonstrate that Föhl's Fundamental Equation is not just a statement of simple accounting relations but expresses a theory of distribution. It is an anticipation of much of what later was propagated as "post Keynesian theory of distribution". Its specific formulation as expressed by our equ.12 depended on the specific assumptions which Föhl inherited from the *Treatise*, namely a given level of sectoral demand and a given income of the factors of production. With hindsight one may argue that as far as the main analytical aim of an income determination theory was concerned, such distribution theoretic observations were a detour. But they show how near Föhl did stay to Keynes in spite of his criticism.[16] An important corollary of these distributional considerations is, of course, that if a "virtuous" increase in factor savings S_f occurred instead of a "riotous" increase in entrepreneurial consumption, then this will diminish profits,[17] and if these have anything to do with investment, then increased savings are not a prerequisite for investment, but a detriment. But this tentative conclusion is ahead of a more detailed investigation of the relationship between profits and investment to follow below.

[16] Contrary to Föhl who took the "widow's cruse" proposition very seriously, Keynes's Cambridge disciples came to refer to it as the "widow's cruse *fallacy*", since under conditions of unemployment output would not stay constant. See **Skidelsky** (1992, pp.447–452) for the discussion of the "widow's cruse" in the *Cambridge Circus*.

[17] If entrepreneurs in turn react to this turn of events with decreased consumption, *i.e.* with an attempt at increasing *their* savings as well, then the "widow's cruse" turns into a "Danaid jar" of ever increasing losses (see **Keynes** (1930, p.125)).

4 Microeconomic conceptions for macroeconomics

4.1 Carl Föhl's defense of microfoundations for macroeconomics

The question which is now before us is to investigate how Föhl's fixation on profits and investment leads to a macroeconomic and *monetary* theory of income determination. In this connection one should remember that a major criticisms of the monetarist counter-revolution of the 1970ies against its Keynesian adversary was the latter's alleged "*ad hoc*ery", this term signifying a lack of proper choice theoretic microfoundations of Keynesian models. Whatever the justification of this claim might be with regard to Keynes, it is quite clear that it is unjustified with regard to **Föhl** (1937b). This author spent considerable space in supplying microfoundations for the structural equations of the economic system which he intends to discuss. In fact, Föhl (1937b; p.172) expressly defends the contribution of the 'marginal utility theory' against claims by Gustav Cassel that this theory is 'unnecessary for economic science'.[18] Quite to the contrary, argues **Föhl** (1937b, p.172), we do need the subjectivistic (microeconomic) approach in order to identify the underlying structural equations when explaining observable economic phenomena. This is the case – I still relate **Föhl** (1937b, p.172) – with regard to observable market price and the demand function of purchasers. Similarly, **Föhl** (1937b, p.174) continues, savings must be explained out of individual needs. He then postulates that in considering these needs we are entitled to regard the creation of savings "of each individual and hence also of the whole group" as being a function of income. **Föhl** (1937b, p.172, fig.30) actually draws such a "Keynesian" $S(Y)$-curve – resp. a curve $S_f = S_f(E_f)$[19] – corresponding to this verbal statement and later employs a total savings curve in order to derive a further "Keynesian" construction, namely a type of IS-curve. But that falls into the realm of macro-economics already and we will go deeper into this aspect in sect.5.2 below. Let us note in the present context that in spite of his extensive use of circular flow representations, it is Föhl's clearly stated methodological position that microfoundations are an important element in macroeconomic theorizing. This approach emerges also quite clearly when it comes to discussing investment demand on the basis of the 'profits' as identified in the "Fundamental Equation" although again much of the established literature on Föhl seems to be of a different conviction.[20]

[18] **Cassel** (1923, p.68) makes this statement, reiterating on the next page by referring to this "purely formal theory, which in no way extends our knowledge of the real events". Cassel regards it as superfluous for a theory of price determination and continues in this vein over several pages. We therefore conclude that Föhl's quote from Cassel is by no means taken out of context and does represent a decided view against microfoundations.

[19] In discussions of this figure of Föhl's, the later literature on Föhl thought that he intended to use it in order to explain *total* savings (For this view see **Müller** 1981, p.160). This is not correct, however. For the total savings function $S = S_f + S_Q$ one has to turn to **Föhl** (1937b, p.271, fig.46), where S ([his] $\mathcal{S} \equiv$ [our] S and [his] $Q_s \equiv$ [our] S_Q) is defined and represented in the latter sense.

[20] For a discussion of this point see Müller (1981), p.162f. where the author points out that Pedersen (1957) was a vehement critic of Föhl's theory of investment. Most provocative is maybe Föhl's (1955; p.217) doctrine that entrepreneurial profits are unaffected by interest rates because profits 'swim on top of them'. For **Hohn** (1970, p.56) Föhl seems to contradict **Keynes** (1936) with regard to the determination of investment. For Müller (1981; p.162) Föhl's and Keynes's theories of individual investment behavior are almost totally congruent if it were not for Föhl's lack of explicit mentioning of "present values" of investment returns, *etc.* We hope to clarify some of these issues in the rest of this paper.

4.2 Mark-ups and profits

4.2.1 Föhl's entrepreneurial market model

Superficially regarded, Föhl seems to have a simple mark-up theory of profits which follows from the sectoral equations of equs.(2) as

$$V = V' + Q_1 = (1 + q_1)V' \qquad \text{resp.} \qquad I = I' + Q_2 = (1 + q_2)I' \tag{13}$$

where $q_1 \equiv Q_1/V'$ and $q_2 \equiv Q_2/I'$ are magnitudes introduced in order to identify sectoral mark-ups explaining the difference between respective turnover and factor cost. The mark-up magnitude "q" appears in Föhl (1955; p.222, fig.34) in the partial analytic representation of supply and demand for a specific good.

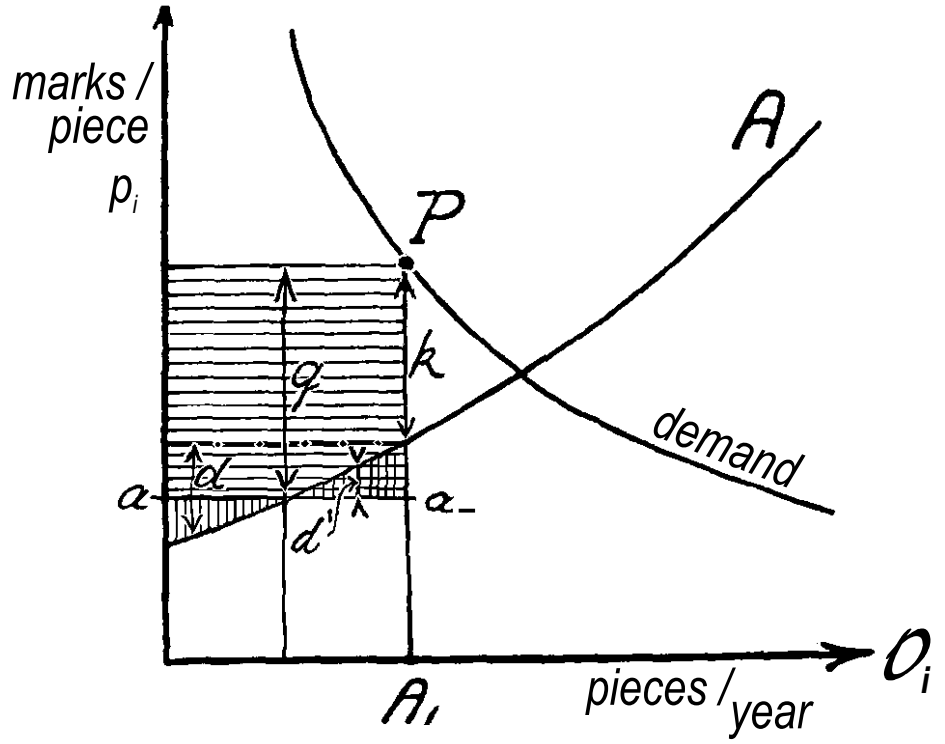

Figure 2: Föhl's microfoundation of the profit share q

Föhl's figure is reproduced here as fig.2 for convenient reference in a translated and slightly adapted form. It links up with equs.13 when we decompose the sectoral money-values depicted there into the respective price (p) and output quantities ($\mathcal{O}$) for the individual suppliers. For the $V-$sector this gives the expressions

$$V \equiv p_1 \sum \mathcal{O}_{1i} = (1 + q_1) \sum C_{1i}(\mathcal{O}_{1i}) \tag{14}$$

where subindex $_1$ identifies variables pertaining to the $V-$sector and index $_i$ signifies an individual supplier of output $\mathcal{O}_1$. His individual cost curve is given by $C_{1i}(\mathcal{O}_{1i})$. The sum

of the individual cost incurred in this sector is total factor cost of this sector, *i.e.* V' in equ.13.

The correspondences of the graphical expressions in fig.2 to the algebraic expressions in equ.14 are the following:[21] p_1 [$\rightarrow \overline{A_1P}$] resp. $\mathcal{O}_1$ [$\rightarrow \overline{aa_-}$] signifies the corresponding price resp. the output, and the cost function $C_{1i}(\ .\ )$ is represented by the marginal cost curve $C'_{1i}(\ .\ )$, the horizontal addition of these individual curves giving the market relevant supply curve [$\rightarrow A-$curve]. A further correspondence is that line q in fig.2 corresponds to the value of q_1 in equ.14 under the *proviso* that the sum of marginal cost as depicted by the area under the A–curve in fig.2 is equal to total cost. These formulations seem to give a rendering of a "representative" supplier on a particular market. But it is one of the main tenets of Föhl's that in principle there is maybe no such representative supplier since an important part of business profits are what he calls "differential profits". Föhl seems to interpret the existence of quasi-rents in such a way that on a given market there are alternative profit situations for individual suppliers.

4.2.2 Föhl's recourse to Enrico Barone

In order to argue this case, **Föhl** (1937b, p.221) refers to **Barone** (1935), Fig.6, reproduced here on the right-hand side of fig.3.

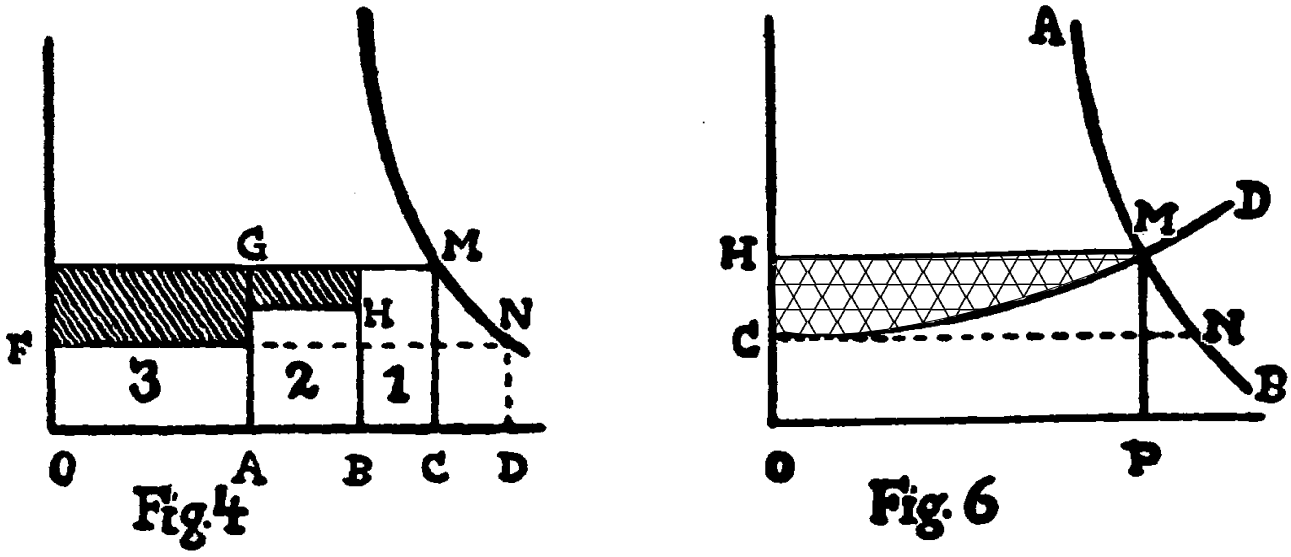

Figure 3: Enrico Barone's analysis of "differential profits" and producers' rent

Barone's Fig.6 seems to offer nothing else but a rendering of "producers' rent" without elaborating the idea of "differential profits". In order to appreciate better the significance of Föhl's reference to Barone, one should, however, note that for Barone this rent as given by the marked area HCM in his Fig.6 is the limiting case of a situation of, say, three producers

[21] The [.]–bracketed terms in this paragraph are supposed to show these correspondence in fig.2. These correspondences not withstanding, fig.2 represents a market and equ.14 represents an individual supplier, of course.

where producer "1" makes zero profits, producer "2" makes positive profits and producer "3" makes even larger profits as depicted by Barone's Fig.4 which is reproduced here in fig.3 alongside that "Fig.6" referred to by Föhl. The essence of his "Fig.4" is, as (**Barone**, 1935, p.20) elaborates, that it depicts a situation which is not sustainable. Obviously supplier "1" can survive only as long as the others do not extend their production. But there will be an incentive to do so in order to reap profits in addition to the ones shown by the respective shaded areas in "Fig.4". Thus, the existence of a supplier with the characteristics of nr. "3" will *e.g.* provoke the emergence of a competitor who sets up the same type of firm in order to have the same type of profits. This will continue until the shaded area of profits disappears due to lower market prices and due to a homogenized cost situation. This means that area MHC in "Fig.6" should be under pressure to disappear. But since it is this very area which Föhl invokes for his theory of investment behavior, we should look a bit closer at the processes and decisions behind this model. This means that for a better understanding of Föhl's argumentation we should clarify the type of constraints which *do* keep the entrepreneurs and the economic system in this particular situation. This closer look will be the subject of subsection 4.3 below. As a preliminary step it might be instructive, however, first to translate the above considerations into a Marshallian framework by inspecting the corresponding cost situation.

4.2.3 A Marshallian re-interpretation

Our figure 4 translates the situation of Barone's producers "1" and "2" resp. "3" in his "Fig.4" as reproduced above into Marshallian cost curve analysis by showing two alternative average cost curves, marked $\emptyset C_m$ and $\emptyset C_n$, to go with a marginal cost curve C' for two suppliers of output $\mathcal{O}$. Since **Barone** (1935, p.25, Fig.10) himself utilizes the underlying S-shaped total cost curve, this interpretation is in keeping with the general orientation of the original. The

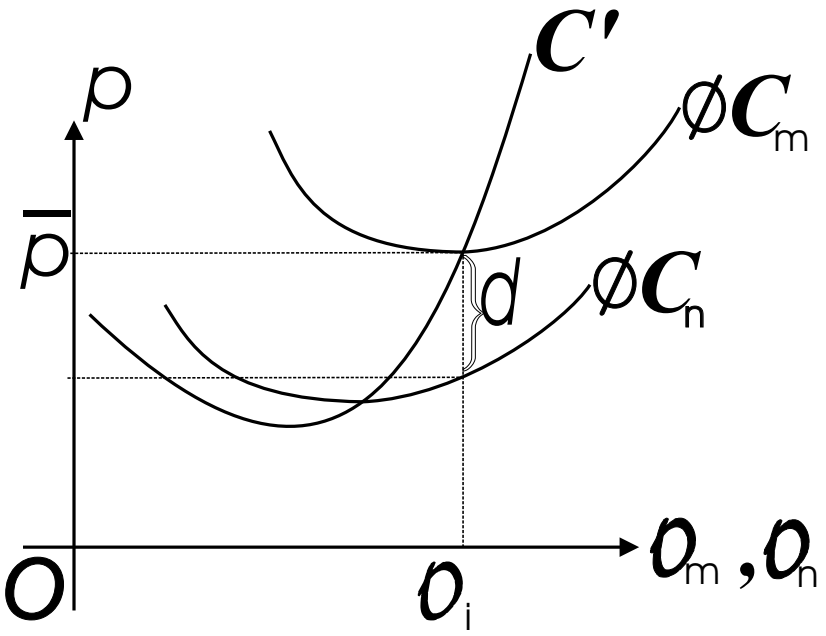

Figure 4: Profit differences between two firms, each supplying good $\mathcal{O}$

correspondence of the situation in our fig.4 to the cases "1" and "2" resp. "3" of Barone's fig.4 just inspected is as follows: Whereas the supplier indexed with $_m$ just meets average cost at market price $\bar{p}$ and thus has zero profits (position "1" in the left half of our fig.3), the supplier marked $_n$ is able to fetch a "differential profit" per piece (see position "2" or "3"), marked as line d in our fig.4[22]. As before, no competitor wants to emulate firm "1" resp. "m", because that firm just breaks even. But the profits of firm "n" induce competitors to emerge. They will have to rely on the same cost curves as "n" if they have no other technological knowledge. Thus they will generate new demand for fixed and variable factors of production. There is therefore an inherent tendency to expand in situation "n" with the consequence that prices and cost differentials will not correspond any more to the situation just depicted. On the other hand: if we do observe such a situation, it must be because change is held back by some constraint. It is plausible to see this constraint in the fixed factor. In a two-factor world with sizeable unemployment of labor, this implies a capital constraint. Type "n"–suppliers appear as working with to low a capital intensity — at least in the operational sense just discussed. The immanent tendency to change in this situation appears to be one of raising the ratio of capital to labor and thus of substituting labor by capital — as soon as the constraint is relaxed. There is, however, a problem involved in this claim, because the supplier with index "n" could incur negative marginal profits since due to increasing average cost an expansion of output might reduce his profit margin unless there occurs a shift in cost curves which over-compensates this tendency. This problem can be dealt with only after a more detailed specification of the cost curves involved. But as long as the absolute level of profits is positive, there will be a tendency towards "more of the same type" of suppliers due to competition. If the capital constraint is one of financing conditions, an easing of these conditions in general — typically represented by the level of interest rates — will induce such "substitution". Substitution of this type should not be confused with substitution along a given isoquant due to a change in relative factor prices, however. This presentation is illuminative in two respects — for what it does depict and for what it does *not* show. It does correspond to a situation showing *pure* differential profits. But it does not show a situation of imperfect competition, since here every supplier obeys the perfect competition rule that $\bar{p} = C'$ holds. Thus this interpretation does not quite meet Föhl's paradigm as depicted by our fig.2 above, since there we had an additional source of profits, denoted there by line k. The profits attributable to this situation Föhl refers to as "scarcity profits".

4.3 Profits and constrained maximization

4.3.1 Föhl's microeconomic conception of profits

Föhl's distinction between "scarcity profits" as expressed by line k in fig.2 on the one hand and "differential profits" as expressed by line d in that figure on the other hand is visually and conceptually fairly clear. It is based on a specific market situation — this is what fig.2 is all about — and it refers to a specific enterprise in such a context. In presenting his model, Föhl expressly asks for the different reasons why a *single* firm[23] obtains a profit. Yet, commentators seem to have had considerable difficulties to make economic sense of

[22] See the corresponding line d in fig.2 above.

[23] Literally, **Föhl** (1937b, p221) refers to "eine Unternehmung" – one firm – or "unsere Unternehmung" – our firm, *i.e.* he always refers to single economic units.

this distinction. That is not to say that there were no attempts to elaborate his concept of differential profits. In the 1950ies and 1960ies they did receive considerable attention under the name of the "cost-returns-diagram". Föhl himself put some new stress on this concept and a number of his researchers at Berlin Free University made attempts to elaborate this diagram as a macroeconomic concept[24]. But his taxonomy as such — with one type of profits, differential profits, being associated with "substitution", while the other type, scarcity profits, being associated with "expansion" — never was elaborated in any detail on the microeconomic level. In so far as this distinction is noted by commentators at all, it is alluded to *verbatim* as if it were some peculiarity of Föhl's[25] but it is not related to general choice theoretic principles.

Thus there is a discrepancy between the secondary literature and **Föhl** (1937b) himself: the former attempts to convey Föhl's analytical concepts as *inherently* macroeconomic irrespective of choice theoretic microfoundations whereas Föhl himself was quite explicit about his micro-analytic perspective. Lest this gap between author and commentators restricts our analytical understanding, we want to bridge it in the following by elaborating the type of choice theoretic models associated with the respective concepts on a microeconomic level.

4.3.2 Capital services constraints and "differential" profits

A microfoundation for the case of "differential profit" could be given by the choice theoretic problem of a profit maximizing entrepreneur who can command a limited amount of capital services $\bar{K}_i$. If he has the target function to maximize profits Q_i producing output $\mathcal{O}_i$ using labour (N_i) and capital services (K_i) with respective factor remuneration rates of a wage rate (w) and a rentals rate for capital services (r), the relevant model is contained in the expression

$$Q_i = p\mathcal{O}_i(N_i, K_i) - wN_i - rK_i + \lambda_i(\bar{K}_i - K_i) \tag{15}$$

where $\mathcal{O}_i(N_i, K_i)$ is the production function and p is the corresponding output price. Suppose for now that the entrepreneur is price taker on all relevant markets. Then the (first-order) 'equilibrium conditions' are:

$$\frac{\partial \mathcal{O}_i}{\partial N_i} = \frac{w}{p} \quad \text{and} \quad \frac{\partial \mathcal{O}_i}{\partial K_i} = \frac{r + \lambda_i}{p} \tag{16}$$

with the Lagrangian multiplier λ_i being the "shadow price" of additional capital services when $\bar{K}_i$ is a binding constraint. When λ_i is positive, then obviously

$$\frac{\partial \mathcal{O}_i}{\partial K_i} > \frac{r}{p} \tag{17}$$

must hold, *i.e.* the marginal product of capital is too high, because without the constraint more capital would have been employed until the decreasing marginal productivity of capital made further extensions unattractive. This model is supposed to represent the entrepreneur indexed with $_n$ in fig.4, whereas the entrepreneur indexed with $_m$ corresponds to a case in which the optimal point of production is reached, no further expansion of capital services appears desirable and λ_i is zero. With this type of microfoundation it might become more plausible why Föhl suggested to isolate an entrepreneurial situation the main characteristics

[24] See **Bolle** *et al.* (1966) The authors insist (p.191) that in their view this concept is quite different from marginal productivity analysis and that it relates to total economic production, not to partial analysis.

[25] See **Müller** (1981, p.164, n.132); **Hohn** (1970, p.59)

of which is "substitution": In the 'equilibrium' as given by equ.16, it is only with regard to labour that we might assume the situation to be without an inherent tendency to change in the sense that with market determined prices the real remuneration of factors is equal to the marginal product. With regard to capital, there is obviously a pronounced tendency to expand. Once satisfied, this tendency might result in increased productivity of labour, reduced cost *etc.*. But *cet.par.* the situation is one where just capital expansion would be desirable and hence a substitution is contemplated in the sense of producing, if possible, at a higher capital intensity than hitherto. This situation should have a particular bearing on investment decisions. But before discussing Föhl's approach to investment decisions, let us briefly return to fig.2 for one further observation: In spite of the stress on a differentiated view of "differential profits" which its discussion entailed, the representation of "a" profit rate q such that $q \times \overline{aa_-} = Q$ as represented by the horizontally shaded area does mean an averaging of differential profits. Expressed graphically, average differential profits are given by line segment $\overline{q-k}$. Expressing this construction algebraically for the j-th sector, we get:

$$p_j \mathcal{O}_j = wN_j + rK_j + Q_j^{diff} \quad \text{with} \quad Q_j^{diff} \equiv \text{total sectoral 'differential profits'} \tag{18}$$

$$= wN_j + rK_j(1 + q_j^{diff}) \tag{19}$$

In the formulation of equ.19 we thus end up with an expression which, *via* q_j^{diff}, associates 'differential profits' exclusively with capital services. The choice theoretic justification for this manipulation was given above with equ.15.

4.3.3 Capital stock constraints and the rate of interest

The discussion so far is lacking an analytical link between capital services and interest rates. This link appears as rather unproblematic in the old established macroeconomics of, say, the neoclassical theory of growth: it is one of identity so that interest rates stand for nothing else but real rentals rates and these in turn are nothing else but an expression of the marginal productivity of capital. We noted already that in the case of Föhl this link is by no means that unproblematic. In the context of his discussion of "differential profits", Föhl (1955; p.223) soon does draw the attention to interest rates as a cost element and takes the building industry as a relevant example. He stresses two particular aspects in this context:

- rents for existing houses tend to be low when interest rates are low and
- the building industry tends to be among the first to pick up in activity at the end of a depression, when interest rates are reduced.

What does this example signify? It draws attention to a particular *asset* K_x (here: houses) which may be let out at a particular *rentals rate* r_x. The example generalizes the observation that r_x stands in connection with the general level of *interest* rates z and these in turn with the "activity" on the market for this particular asset as characterized by the market variables *asset price* p_x and *asset quantity* where the quantity relevant for a contemplation of the variability of economic activity is the *flow demand* ΔK_x. A simple model accommodating these observations follows from regarding the dispositions of an owner of a certain physical stock of capital ($\bar{K}_{xi}$) which may be rented out or traded. Disregarding depreciation of stocks through usage and passage of time[26] and disregarding also appreciation of asset prices, a

[26] Föhl (1955; p.223) seems to have been well aware of such a simplifying assumption. He explicitly stresses that buildings are long-lived and require only comparatively few expenses on maintenance and repair.

relevant formulation of a profits equation which takes account of the rate of interest as an element of cost — or in any case as an element of opportunity cost — is given by

$$Q_{xi} = r_x K_{xi} - z p_x(\Delta K_x) \quad \text{with} \quad \Delta K_x \equiv K_{xi} - \bar{K}_{xi} \tag{20}$$

where Q_{xi} = profit of the $i-$th capitalist who holds asset $\bar{K}_{xi}$ at the beginning of the current period. Profit is depicted as being composed of rentals income ($r_x K_{xi}$) out of stock supplied for rent minus the interest due for the financing of any flow demand of capitalist i for this particular asset. As is evident from the definition of this flow demand, given in equ. 20, its sign value may be either positive or negative, depending on $K_{xi} \lesseqgtr \bar{K}_{xi}$, *i.e.* depending on whether the asset holder wants to change his existing stock either as buyer or as seller. As is well known, this latter term poses considerable choice theoretic problems, since a change in the asset price p_x will have different wealth effects depending on the sign value of $K_{xi} - \bar{K}_{xi}$. Disregarding these problems by assuming p_x to be exogenously given and constant, the first-order conditions for profit maximization may be stated as

$$r_x + \frac{\partial r_x}{\partial K_x}\frac{\partial K_x}{\partial K_{xi}} K_{xi} \;=\; z p_x \quad . \tag{21}$$

This expression shows a relation between the nominal rentals rate of capital r_x on the left-hand side and the value of interest payments on the marginal unit of asset K_{xi} on the right-hand side. In between is an expression depicting market conditions. Our simplified case regards only the market conditions for the services of this particular capital asset. The model assumes that there is a function

$$r_x = r_x(\underbrace{K_x(\overbrace{K_{xi}}^{+})}_{-}) \tag{22}$$

where the sign values associated with the braces depict the sign values of the derivatives with respect to the corresponding variables. In terms of elasticities, function 22 is characterized by

$$E^{r_x}_{K_x} \equiv \frac{\partial r_x}{\partial K_x}\frac{K_x}{r_x} < 0 \quad \text{and} \quad E^{K_x}_{K_{xi}} \equiv \frac{\partial K_x}{\partial K_{xi}}\frac{K_{xi}}{K_x} \gtreqless 0 \quad . \tag{23}$$

The first of these elasticities says that the rentals rate r_x is assumed to decline when more services of asset K_x are brought to market. The second elasticity says that the amount of asset K_x brought to market depends on the action of the $i-$th capitalist *and* on the reaction of all the other capitalists. Normally this expression is positive. But if the market share of the capitalist under consideration is extremely small, then we have $(K_{xi}/K_x) \to 0$ and this elasticity — and hence the whole market condition term in equ.21 — disappears. But market conditions are normally not atomistic in this sense — and the significance of Föhl's concept of there being typically a positive difference between price and marginal cost as shown by line k in fig.2 is exactly to stress this element of non-atomistic, *i.e.* imperfect, competition. But then the market terms in equ.21 *are* significant. They require that the real rentals rate must be larger than the rate of interest. With the help of the elasticities just defined we may write this observation algebraically as

$$(1 + \rho_{xi})\frac{r_x}{p_x} = z \quad \text{with} \quad \frac{r_x}{p_x} > z \tag{24}$$

where[27]

$$-1 < \quad \rho_{xi} \equiv E^{r_x}_{K_x} E^{K_x}_{K_{xi}} \quad < 0 \quad . \tag{25}$$

Assuming now market conditions as expressed by ρ_{xi} to be constant, it follows immediately that if the rate of interest z drops on the right-hand side of equ.24, then on the left-hand side either the rentals rate for the capital stock – *i.e.* the rent in case of a house – or the asset price – *i.e.* the price for existing houses – must increase, or both. The former case – a decrease in rents when money rates of interest decrease — was mentioned at the beginning of this subsection as having been stressed in Föhl's paradigm. The latter case of increasing asset prices makes their production *cet.par.* more profitable when interest rates go down. Hence Föhl's second observation about the increased activity in buildings industries also is taken account of in the present context. A third observation is offered by this model: although the comparative statics of real rentals rates and money rates of interest are related, this relationship is a tenuous one as is seen from the inequality in expression 24 and as is re-enforced by the supporting considerations of footnote27. The real rentals rate should virtually always be larger than the interest rate. In addition, we know from equ.17 on p.17 that the marginal product of capital is larger than the rentals rate whenever 'differential profits' exist. Generalizing on the basis of these two models and omitting the goods–specific subindices, we may therefore write:

$$\frac{\partial \mathcal{O}_i}{\partial K_i} > \frac{r}{p} > z \tag{26}$$

This means that the marginal product of capital is *twice* removed from the rate of interest – which should make for a potentially problematic relationship between the money rate of interest on the one hand and investment as addition to capital stock due to its marginal productivity on the other hand.

4.3.4 Functional constraints and "scarcity" profits

So far, our discussion concerning Föhl's microfoundations has covered only his concept of "differential" profits. It was seen that they are primarily related to constraints concerning capital services and capital stock but that also market imperfections come into play. This is

[27] A fuller version of such a model would have to stress that market imperfections are not only to be expected for selling capital services as expressed by ρ_{xi} but in addition also for buying and selling the asset K_x itself. For a capitalist "k" who is aware of the latter effect as well, we thus must take account not only of the rentals equation 22, but also of a price equation $p_x = p_x(K_x(K_{xk}))$. Putting these two equations into the profits equation of equ.20 leads, of course, to an equilibrium condition somewhat different from equ.24 above. We may express this difference by replacing the bracket in equ.24 by $(1 + \ \rho_{xk}) \ \equiv (1 + \rho_{xi})/(1 + E^{p_k}_{K_x} E^{K_x}_{K_{xk}} \hat{K}_{xk})$ where ρ_{xi} on the right-hand side of this identity is defined analogous to equ.25 and where the last term in the last bracket is defined as $\hat{K}_{xk} \equiv \Delta K_{xk}/K_{xk} \ \gtreqless \ 0$ depending on whether subject "k" wants to buy or sell K_x. This modification makes the inequality expressed in equ.24 even stronger, since the denominator of our modified ρ_x-term is larger than unity. This follows no matter whether capitalist "k" is a) a buyer or b) a seller of K_x. Case a): When $\hat{K}_{xk} > 0$ then $p'_x(\cdot) > 0$ because additional demand drives up the market price. The said denominator has only positive terms and therefore our present ρ_{xk} is larger than the ρ_{xi} of equ. 25. Case b): $\hat{K}_{xk} < 0$ and $p'_x(\cdot) < 0$ because additional sales drive down the market price of K_x. Again the denominator for our present $(1 + \ \rho_{xk})$-expression will be positive and larger than unity. In this case the deviation between the real rentals rate of capital and the money rate of interest as expressed by the inequality in equ.24 must be greater as stated there. Thus, a fuller view along the lines of this footnote of the model under discussion in this section re-enforces rather than reduces the validity of the above conclusions.

even more so when we turn to his concept of "scarcity profits" as expressed by line "k" in fig.2 above, standing for differences between market demand price and the supply conditions as characterized by marginal cost. A model relevant for this case should be one which presents entrepreneurs as being conscious of prices and quantities facing them on the product market on the one hand and production conditions on the other hand. Such a model may be given by

$$Q_\ell = p\mathcal{O}_\ell - wN_\ell - rK_\ell \; + \; \lambda_\ell^p(p - p(\; \mathcal{O}(\mathcal{O}_\ell); B) \;) \; + \; \lambda_\ell^{\mathcal{O}}(\mathcal{O}_\ell - \mathcal{O}_\ell(N_\ell, K_\ell) \;) \tag{27}$$

where the term after the Lagrangian multiplier λ_ℓ^p signifies the awareness of the ℓ-th entrepreneur that his quantity dispositions $\mathcal{O}_\ell$ affect market quantities $\mathcal{O}$ and where the term after the Lagrangian multiplier $\lambda_\ell^{\mathcal{O}}$ signifies the input-output technology under which the entrepreneur operates. It should be noted that both of these constraints are functional constraints. They do not imply specific values of the functions stated. Magnitude B in equ.27 is a shift parameter for the product demand function expressing preferences and budget constraints of the consumers. The model described by equ.27 need not be discussed here in full[28]. Let it suffice to note that the first-order conditions lead in particular to the following two well–known equilibrium conditions as well as to a formulation of turnover expectations as stated by 30 (index ℓ is now omitted)

$$w = (1+\rho_{\mathcal{O}})p\frac{\partial\mathcal{O}}{\partial N} \tag{28}$$

$$r = (1+\rho_{\mathcal{O}})p\frac{\partial\mathcal{O}}{\partial K} \tag{29}$$

$$D = p\mathcal{O} \qquad \text{with} \quad \rho_{\mathcal{O}} \equiv E_{\mathcal{O}}^p E_{\mathcal{O}_\ell}^{\mathcal{O}} \leq 0 \tag{30}$$

It is due to imperfect competition on the product market that this particular discrepancy exists between the value marginal product of labor and capital on the one hand and the respective remuneration rate for their services on the other. This discrepancy, identified by $\rho_{\mathcal{O}}$, is an important source of non-factor income Q according to Föhl. Income shares are easily deduced from equ.28 and equ.29 by multiplying them with $N/p\mathcal{O}$ resp. $K/p\mathcal{O}$ giving

$$\frac{wN}{p\mathcal{O}} = (1+\rho_{\mathcal{O}})\frac{\partial\mathcal{O}}{\partial N}\frac{N}{\mathcal{O}} = (1+\rho_{\mathcal{O}})\;\alpha \tag{31}$$

$$\frac{rK}{p\mathcal{O}} = (1+\rho_{\mathcal{O}})\frac{\partial\mathcal{O}}{\partial K}\frac{K}{\mathcal{O}} = (1+\rho_{\mathcal{O}})\;\beta \tag{32}$$

where α and β are partial elasticities of production, defined as

$$\alpha \equiv \frac{\partial\mathcal{O}}{\partial N}\frac{N}{\mathcal{O}} \qquad ; \qquad \beta \equiv \frac{\partial\mathcal{O}}{\partial K}\frac{K}{\mathcal{O}} \quad . \tag{33}$$

Since factor incomes E_f resp. total income E are given by

$$E_f = wN + rK \qquad \text{resp.} \quad E = p\mathcal{O} \quad \text{or by} \quad E = (1+q)E_f \quad , \tag{34}$$

we sum and simplify equations 31 and 32 in order to receive

$$\frac{wN + rK}{p\mathcal{O}} = \frac{E_f}{(1+q)E_f} = (1+\rho_{\mathcal{O}})(\alpha+\beta) \quad . \tag{35}$$

[28] For a detailed presentation and discussion of this model in the context of a Keynesian approach see **Ambrosi** (1981).

In the middle term of equ.35 E_f cancels and thus we arrive at an expression which explains q by means of the terms on the right-hand side: technological parameters α and β and the competition parameter $\rho_{\mathcal{O}}$. But since capital services constraints, discussed above, were not taken account of here, the mark-up q under the present discussion must be identified as a specific case, namely as the still not accounted for "scarcity profits" q^{sc} in the sense of Föhl. Thus we finally arrive at the expression

$$q^{sc} = \frac{1-(1+\rho_{\mathcal{O}})(\alpha+\beta)}{(1+\rho_{\mathcal{O}})(\alpha+\beta)} \quad . \tag{36}$$

This rather unwieldy expression may be simplified. Assuming a linearly homogeneous production function with $\alpha+\beta=1$ reduces equ.35 to an expression just in terms of $\rho_{\mathcal{O}}$. The whole modeling would have been pointless if we further assumed perfect competition so that $\rho_{\mathcal{O}}=0$. But it was exactly the intention of Föhl to admit for the complications of imperfect competition and of increasing returns. Thus we conclude that this model is very much in keeping with Föhl's analytical intentions.[29]

Summarizing this subsection on "profits and constraints", we note that in formulating a variety of constraints suggested by Föhl's graphical and verbal presentations, we supplied microfoundations for Föhl's concepts of "differential profits" on the one hand and for his concept of "scarcity profits" on the other hand. In addition, we distinguished from these different types of profit income the contractual factor income of capital and we showed the tenuous relation of the rate of interest to the marginal physical product of capital in this scheme. It should be noted that these "unconventional" results are by no means due to a negation of economic calculus. Neither are they due to postulated rigidities as one later encountered in neo–Keynesian "disequilibrium" models of the Malinvaud–type. We conclude that, as far as entrepreneurs are concerned, Föhl by no means intends an economically agnostic off-curve analysis. Quite to the contrary, he insists on the relevance of the economic calculus in the entire context of economic model building.

We may now reflect briefly on a few distributional aspects of Föhl's taxonomy of profit types before returning to the topic of the structure and usage of these concepts in the context of his macroeconomic model.

4.4 Microfoundations and the distribution of income

With given technology, any change in national income must be brought about by factors of production. If there are just two such factors and no technological progress, changes in real income must then necessarily be associated with corresponding input changes as given by

$$\hat{\mathcal{O}} = \alpha\hat{N} + \beta\hat{K} \tag{37}$$

if we subscribe to the concept of (given) "elasticities of production" as defined by equ.33. It is only under exceptional circumstances, however, (linearly homogeneous production functions, perfect markets, perfect competition) that these elasticities also identify the respective factor shares. In a more general setting, taking equs.28 and 29 and the relationship between marginal productivities and factor remuneration as stated for that type of model, we obtain, after minor reformulations, the following relations between factor shares and elasticities of

[29] For his views on increasing returns see Föhl (1966).

production:

$$\alpha = \frac{1}{1+\rho_{\mathcal{O}}}\frac{wN}{p\mathcal{O}} \qquad ; \qquad \beta = \frac{1}{1+\rho_{\mathcal{O}}}\frac{rK}{p\mathcal{O}} \quad \text{resp.} \quad \beta = \frac{1+\lambda_i}{1+\rho_{\mathcal{O}}}\frac{rK}{p\mathcal{O}} \quad , \tag{38}$$

where the latter formulation for β enlarges on our last expression for capital services remuneration r as given by equ.29 by introducing also the source for "differential profits" which was associated with a capital services constraint as identified by equ.16 on p.17. Substituting now β in equ.37 by this latter expression and substituting α analogously, gives

$$\hat{\mathcal{O}} = \frac{1}{1+\rho_{\mathcal{O}}}\frac{wN}{p\mathcal{O}}\hat{N} + \frac{1+\lambda_i}{1+\rho_{\mathcal{O}}}\frac{rK}{p\mathcal{O}}\hat{K} \quad . \tag{39}$$

Reformulating this equation finally gives three different components of income associated with capital services resp. profits, each identified by the following overbraces:

$$\hat{\mathcal{O}} = \underbrace{\frac{wN}{p\mathcal{O}}\hat{N} + \overbrace{\frac{rK}{p\mathcal{O}}\hat{K}}^{\text{"rent"}(r)}}_{\hat{E}_f/p} + \underbrace{\overbrace{\frac{-\rho_{\mathcal{O}}}{1+\rho_{\mathcal{O}}}\frac{wN}{p\mathcal{O}}\hat{N} + \frac{-\rho_{\mathcal{O}}}{1+\rho_{\mathcal{O}}}\frac{rK}{p\mathcal{O}}\hat{K}}^{\text{"expansion"}(q^{sc})} + \overbrace{\frac{\lambda_i}{1+\rho_{\mathcal{O}}}\frac{rK}{p\mathcal{O}}\hat{K}}^{\text{"substitution"}(q^{diff})}}_{\hat{Q}/p} \quad . \tag{40}$$

This equation identifies how a given output growth accrues either to the incomes of the factors of production ("E_f") or to profits ("Q").

The first out of the five fractions in this equation represents payments to labor proper. Together with contractual income to capital *via* rentals rates for its usage, these two terms make up factor income.

Profits in the strict sense are identified by the second underbracket. They are *always* associated with market imperfections. These do not necessarily originate from the product markets. If product markets were perfect, the ρ-s would be zero and "scarcity profits", associated by Föhl with a balanced expansion of factor employment, would disappear. Nevertheless, this does not yet mean that all sources of profits would disappear. There might persist "differential" profits, associated exclusively with capital services. Their limited availability could imply imperfect entrance possibilities for new firms. If only the latter source of profits persisted, it would give a bias towards capital expansion. Hence Föhl's characterization of the last term in equ.40 as expressing tendencies to substitute labor through capital.

Let us be clear that it is not Föhl's concern to work out the detailed implications of his taxonomy of profit types or to debate imperfect competition. He simply states such a classification and refers the reader in this context to standard microeconomic models as exemplified by the writings of Enrico Barone. Few readers followed Föhl on this train of thought, however. His taxonomy of profit types appears in the literature as an idiosyncrasy — if it is reproduced at all. It was our main concern to show the basic choice theoretic rationale behind Föhl's remarks. Let us furthermore be clear that our microfoundations of some of Föhl's graphical and verbal presentations concerning different types of profits has dealt only with simplified cases, leaving technological progress, price changes and many other relevant aspects untouched. The analytical framework of standard microeconomics is easily extensible to these cases, however, and criticism of Föhl's approach in this regard should stimulate not an abandonment but an extension of his analytical suggestions.

5 Carl Föhl's macroeconomic determination scheme

5.1 The structural equations

The main point of microfoundations in a macroeconomic setup is to give choice theoretic underpinnings to the structural equations which make up the macroeconomic model. The question before us now is therefore: How do the microfoundations just discussed in sect.4 link up with the Fundamental Equation discussed in sect.3? The latter identified three economic variables: profits Q, savings S, and investment I. Of these, profits are just an accidental variable. Although they appear prominently in the Fundamental Equation, their appearance in the macroeconomic context depends on the specific combination of the expressions for total income as was seen above in discussing equs.4. In fact, if we take Föhl's variants of the Fundamental equations, it will appear that they, too, are easily translated into an $I = S$ equation. Take, *e.g.*, equ.7 and remember that it is based on the classical savings function. According to that behavioral assumption entrepreneurs save all their profits. Thus, we have $Q = S_u$, and since total savings are $S = S_u + S_f$ it will appear immediately that if we make these replacements in equ.7, then that Fundamental Equation reduces to nothing else but to $S = I$. The same holds true for the second variant of the Fundamental Equation, namely equ.9. If we realize that we can reformulate that equation to show on the left-hand side $S_u = Q - V_u$, then we need only to bring S_f also to the left-hand side in order to again end up with $S = I$. Thus the only important structural equations in this model are the ones that explain the magnitudes I and S. This logic does not escape Föhl but it conflicts with his dedication to the approach of the *Treatise*. He resolves this conflict by making Q a shift variable and thus preserving it in his income determination scheme in a way which we will regard in more detail below in discussing fig.5.

Föhl, like Keynes in the *General Theory*, in the end arrives at the formulation of an interest dependent investment function and of an income dependent consumption resp. savings function. It is true that the latter finds only cursory microfoundations in the case of Föhl. But he is quite clear that it must be analytically related to marginal utility theory and it is in the context of debating the income dependent consumption resp. savings function that Föhl formulates his advocacy of microfoundations.[30] It is maybe not with utter stringency, but nevertheless with the consciousness for choice theoretic foundations that Föhl (1955; p.275 n.113) formulates his consumption function as

$$C = f(E_f, Q) \quad \text{resp.} \quad S \equiv E - C = S(E_f, Q) \; . \tag{41}$$

Thus consumption and savings are clearly stated as being income dependent which is formally as near to Keynes as one could get – although Föhl combines this statement with some acrimony against Keynes's income accounting which we have dealt with above already. In any case, the Keynesian consumption function is a clearly stated element of the Föhlian system.

The main thrust of Föhl's microeconomic analysis is directed not at consumer behavior but at entrepreneurial behavior. In terms of a structural equation, the result of these considerations boils down to an investment equation which he discusses mainly graphically thus expressing the functional relationship

$$I = I(z, Q) \tag{42}$$

[30] See above, footnote nr.18 and the surrounding debate for this point.

where z is the money rate of interest.

The secondary literature to Föhl has mused extensively about the logic behind this function.[31] For Föhl there are two main aspects which it represents: On the one hand – and this is quite conventional – **Föhl** (1937b, p.224) invokes the relationship between the marginal productivity of capital and the rate of interest. This aspect corresponds to our "capital stock" model of equ.20 and the subsequent discussion in that section. In this framework it is quite clear that for zero profits there will be no investment if the rate of interest is equal to the marginal product of capital and that investment demand is a falling function of the rate of interest as expressed by **Föhl** (1937b, p.264, fig.42) graphically. But there is a second, less conventional, aspect to his investment theory. This is his doctrine of differential profits as expressed by our equ.15 (p.17) and elaborated in the subsequent discussion. It will be remembered that the strategic constraint in that context were given capital services. Implicitly, Föhl argues that a lowering of the rate of interest relieves this constraint and this means an increased employment of capital services, and this must be based on increased investment. It is true that Föhl does not specify this transmission mechanism between the money rate of interest and investment demand in any formalism. But he sets it out verbally and thus he supplies an interesting additional aspect to the microfoundation of the interest dependent investment function.

5.2 Föhl's macroeconomics of employment and interest rates

With consumption resp. savings being income determined as shown by equ.41 and investment being interest rate determined according to equ.42, it is a logical next step to construct a *locus* depicting equ.1 of p.6 above in an interest rate and income plane. Such curves are a close analogue to orthodox Keynesian IS-curves and they are in fact drawn by Föhl. His corresponding construction is reproduced below in fig.5 in the interest rate and employment plane and they will now be commented in order to elucidate Föhl's procedure. Turning first to the left-hand part of fig.5 we note a group of curves marked by $\mathcal{I}$. These represent interest dependent investment functions as described by equ.42. The shift parameter leading to their displacement is Q depicting alternative levels of profits. This leads to the question whether the $\mathcal{I}$-curves should not rather be drawn as I'-curves: if profits are identified separately, it should be only factor incomes which are depicted by the respective functions. Föhl does deal with this problem in a very circumspect way but in the interest of simplification we decide to abstract from this problem and note that the $\mathcal{I}$-curves are a variant of representations of the well-known investment function which in this case does not identify values as dependent variables but sectoral employment. Total employment is then given by adding sectoral employment of the consumption sector. The latter is assumed to be constant. The E-curves on the right-hand side of fig.5 relate interest rates z to total employment in hours

[31] Hohn (1970) p.59-63 sees fundamental differences between Keynes and Föhl. Müller (1981), p.162-165 expresses his conviction that there are very wide ranging congruences between the two authors as far as individual investment decisions are concerned but he distinguishes between microeconomic and macroeconomic investment functions. **Krelle** (1966, pp.102–105) discusses Föhl's investment function in historical context and attributes to Föhl a stronger profits orientation in comparison to Keynes but is contradicted in this view by (**Müller**, 1981, p.164). **Pedersen** (1957, p.9*) takes exception against Föhl's treatment of interest as a contractual cost factor comparable to wages cost and on the grounds of this criticism he insists: "Investment *therefore* [my emphasis, GMA] will seem less profitable to the entrepreneur when a rise in the rate of interest has occurred ...". Föhl reaches the same formal conclusion but with a different argumentation. This set of problems will be dealt with in sections 5 and 6 below.

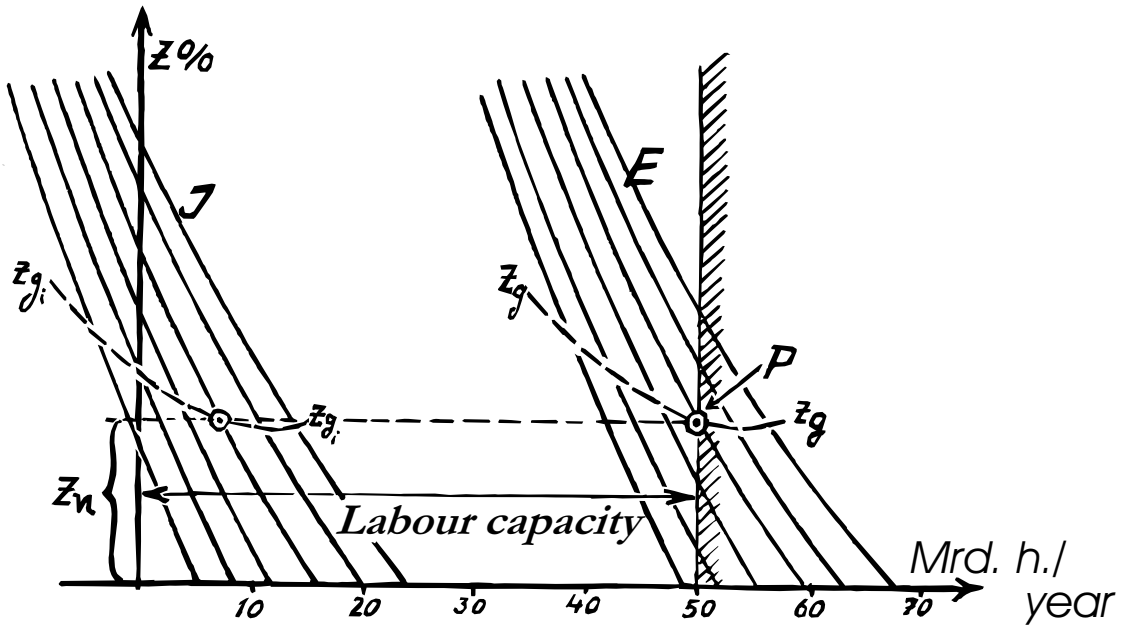

Figure 5: The z_g-curve, the "natural rate of interest" and full employment

per year, resp. to the income generated under the alternative employment situations. As just noted, the left-hand side of figure 5 is nothing else but an investment function. It states: if the rate of interest were equal to the marginal product of capital and profits Q were zero, there would be no incentive to expand capital services. If, however, for $Q = 0$ still holding, the interest rate decreased, there would be a discrepancy between the opportunity cost of financing investment and the marginal returns of the existing capital services. This discrepancy would stimulate expansion of capital demand and hence it would lead to increased employment and factor income in the investment goods sector as shown along the $I-$curve on the left-hand side of fig.5. With given employment in consumption activities, total employment could be read along the corresponding $E-$curve. It is instructive to place this curve in the context of the income accounting equations of equ.4 on p.7.

As is well known, the – by now – "traditional" $IS-$curve of macroeconomic textbooks is derived from this type of equations by replacing macroeconomic consumption C *via* the consumption function $C = C(Y, ...)$ and I *via* the investment function $I = I(z, ...)$ if z is the rate of interest. Hence we have $S \equiv Y - C(Y, ..) = S(Y, ...)$. Replacing S and I in equ.5 gives the well-known Keynesian *locus* in the interest rate and income plane.

In contrast to this procedure, Föhl's $E-$curve just discussed is derived *via*

$$Y = \bar{V}' + I'(z) + Q \quad . \tag{43}$$

Although Föhl thus also arrives at a *locus* in the interest-and-income (resp. employment) plane, and which is visually very reminiscent of the $IS-$curve of Keynesian analysis, it should be noted that this particular type of Föhl's curves is not really comparable to the Keynesian ones. The main difference is that for any level of investment sector income (or employment) as given by I along the correspondingly marked curve, non-investment sector income (or employment) will be constant so that the total income curve marked E will be just a parallel to the $I-$curve. The implicit assumption of such a construction is that marginal

savings due to an increase in income will always be unity – an assumption which is really not compatible with the Keynesian $IS-$curve and also not with Föhl's income dependent savings curve the existence of which was pointed out above. Föhl is in fact quite aware of this discrepancy and solves it by constructing an additional curve, the "$I-\mathcal{S}-$curve" which does take into account that consumption and savings are income dependent. For a detailed study of this procedure we must refer the reader to the original and there in particular to the discussion in connection with his figure 46 (**Föhl** (1937b), p.271). The ultimate result of these rather involved graphical deductions is a z_g-curve which also appears in fig.5. It is this curve which, in income terms, is the true analogue to the well-known IS-curve. Algebraically it may be formulated as

$$Q = I(z) - S(V' + I' + Q) \tag{44}$$

where the symbols have the meanings as defined in sect.3 above. For $Q = 0$, equ.44 reduces to $I(z) = S(Y)$ and it is clear that this expression describes the conventional IS-curve. Föhl makes a number of special assumptions which somewhat blur the principal analogy between his analysis and the later Keynesian one. Föhl in particular assumes constant output in the consumption goods sector ($V' = \bar{V}'$) and alternative levels of profits ($Q = Q_i, \;\; i = 1, 2, \text{etc.}$) in constructing his z_g-curve. But these peculiarities not withstanding, it should be clear that it stands for the same analytical conception as the IS-curve. It can be shown that with increasing profits, equilibrium interest rates should indeed be decreasing.[32] This is also quite reasonable since with increasing profits income and savings increase and hence the equilibrium interest rate should decrease in order to absorb the higher savings *via* higher investment. Since income and employment are an increasing function of profits, the falling z_g-*locus* as depicted by Föhl to the left of the capacity frontier in fig.5 is indeed analytically plausible. A detailed reconstruction of Carl Föhl's view of the macroeconomic *nexus* between the rate of interest and employment should guard us from finding too close a resemblance of Föhl's approach to the one of Keynes in the *General Theory*. The correspondence between the two is a matter of principle in general and of special cases in particular. There are indeed a few analytical setups, *e.g.* point P in fig.5 where we do have a coincidence of both systems. In this particular point the economy is working at full capacity and $I = S$ holds. In such a situation it seems plausible that the real satisfaction of consumption demand is constrained by the capacity to supply and is therefore unchanging so that Föhl's 'problematic' assumption of $V' = \bar{V}'$ might be considered as warranted. But relying on such limiting cases in an analytical evaluation would not do full justice to Föhl, because it misses an important element of his theorizing, namely his "dynamical" critique of general equilibrium analysis.

5.3 The natural rate of interest and total equilibrium

It is, of course, not with regard to situations of full employment that **Föhl** (1937b, pp.311ff.) sees his main contribution in comparison to his precursors. In his discussion of this question Föhl is strongly oriented towards **Wicksell**'s "differential rate" theory which explains monetary expansion through a difference between a "natural rate of interest", defined through

[32] The differential of equ.44 may be written as $dQ = \frac{\partial I}{\partial z}dz - \frac{\partial S}{\partial Y}(\frac{\partial I'}{\partial I}\frac{\partial I}{\partial z})dz - \frac{\partial S}{\partial Y}\frac{\partial Y}{\partial Q}dQ$ and hence as $(1 + \frac{\partial S}{\partial Y}\frac{\partial Y}{\partial Q})dQ = (1 - \frac{\partial S}{\partial Y}\frac{\partial I'}{\partial I})\frac{\partial I}{\partial z}dz$ where $Y \equiv V' + I' + Q$ and where in the last expression $\frac{\partial I}{\partial z}$ is negative. Since the brackets in this expression may both be taken to have positive sign values, it follows that $\frac{dz}{dQ}$ should be negative.

the volume of savings on the one hand, and a "market rate of interest" on the other. Föhl sees one crucial flaw in **Wicksell**'s argument to have been exposed in Keynes's *Treatise* by having demonstrated that the transmission mechanism of a lower market rate of interest towards a higher quantity of money does not go *via* the banks but *via* the entrepreneurs. But there is another flaw in **Wicksell**'s argument which Föhl considered as not having been exposed prior to him. This is the assumption that there should be only one unique "natural rate" in the sense of **Wicksell** (1898) **Wicksell**. Here now Föhl's z_g-curve comes into play. It is supposed to show that for any level of profits Q there is an associated "natural" rate of interest – not only for full employment. In this regard Föhl is parallel to the *General Theory* which maintains the same tenet concerning the non-uniqueness of the "natural rate". Nevertheless, Föhl's argument is quite different in that it rests on variations in Q whereas Keynes, who is prepared to accept the assumption of a "given", i.e. unchanging, degree of competition abandons the analysis of short-period variations of the Q-s in the *General Theory*. In this sense Föhl's analysis is not just a limiting case of the Keynesian one but a generalization. Therefore, his analysis of variants and variations of profits and the associated tendencies in employment rates merit some systematic reconsideration and maybe a revival. Thus, Föhl, in his critique of Wicksellian monetary theory, occupies a half-way house between "classical" comparative statics on the one hand and "Swedish" dynamic analysis on the other. It is the heuristic dynamics which flow from Föhl's openness concerning the contextual size of profits which might make it interesting to go through his analytical steps again. This may be seen in more detail by re-creating his analysis of lapses from points like P in fig.5 resp. of movements towards such points.

6 Carl Föhl's monetary analysis

6.1 Money and circular flow analysis

In the preceding section we presented Carl Föhl primarily in the light of Keynesian analysis. In this section the intention is to present more of the flair of his specific argumentative pattern.

As the title of **Föhl** (1937b) suggests, his book is intended to supply an analysis of the creation of money, stressing particularly its circular flow context in the national economy. In justifying this approach in a chapter on "The Economic Circular Flow", **Föhl** (1937b, pp.23ff.) refers first to Irving Fisher's "equation of exchange". But, invoking Keynes's earlier criticism, he dismisses this formulation of economic interdependence as a mere identity.

In search for a more substantive presentation of the traces left in the economy by newly created money, **Föhl** (1937b, p.25) arrives at **Cantillon** (1755) — an author whose analysis he considers to be unsurpassed by his own contemporary,[33] Hans **Neißer** (1928), although **Föhl** (1937b, *e.g.* p.26,n.3) is full of praise for **Neißer** with regard to his money demand analysis![34] Why this dissatisfaction with his contemporary analysis? From an extended

[33] Compare **Hayek** (1931, p.XXX) who, as editor of a German translation of Cantillon's *Essai*, considers him to be unsurpassed and even not reached by the later classical economists. For a more recent — by and large not less positive — assessment see **Brewer** (1992). He points out (**Brewer**, 1992, p.80) that Cantillon was the first to coin the term "velocity of circulation". **Hayek** (1931, p.XXXI) approvingly quotes **Holtrop** (1928, p.9) that Cantillon was the first to also point out in an unambiguous way that the velocity of money has the same monetary significance as the quantity of money itself.

[34] For a recent assessment of Neißer's contributions to economics see **Trautwein** (1996).

discussion of the literature it emerges that Föhl sees a grave deficiency in its lack of an appropriate categorization of economic subjects.

This is the analytical point where he sees particular merits in Keynes' distinction between "entrepreneurs" and "consumers". But, as seen above (see sect.3.1, p.6), Keynes does not go far enough in this regard according to **Föhl** (1937b, p.30). Thus he proceeds to proposing to place Keynes in an extended analytical context characterized by the ancient writings of François Quesnay and the Physiocrats on the one hand and by Ferdinand **Grünig** (1933) as most advanced author of this direction on the other hand.

This latter author is barely mentioned by Föhl and he is not extensively discussed by him but he merits a more elaborate treatment than he finds there — and which we can offer here. **Grünig** (1933) is interesting to note as an early analyst of the circular flow of economic activity for a number of reasons: Like Föhl, he was engineer by academic education and like Föhl he tried to comment on his contemporaneous economic political problems. Grünig decomposes the economy not only into income receiving classes but also regionally and stresses the importance of stimulating economic exchange. Grünig attempts to construct a formal economic model of the economy and thus he anticipates much of those analytical developments which later were associated with the Keynesian macroeconomic school. Certainly **Grünig** (1933) must have inspired **Föhl** (1937b) to a far greater extent than emerges from Föhl's cursory — though complimentary — mentioning of this book.

It is also noteworthy that for (**Föhl**, 1937b, p.28) the main contemporary problem in monetary analysis is not so much a dearth of circular flow concepts but a plethora of ill-focused usages of the term. In the light of this complaint it is particularly interesting to comment on the usage of the concept of "circular flow" in **Schumpeter** (1911)because **Föhl** (1937b, p.7) praises his monetary analysis even before he mentions Keynes. It is indeed superficially interesting to note that **Schumpeter** (1911, ch.1) begins his enquiry into economic development with virtually the same term as **Föhl** (1937b) does: Schumpeter's first chapter addresses in its title the "Kreislauf der Wirtschaft" which at first sight is just a variant of the term "Wirtschaftskreislauf" which Föhl uses in the title of his dissertation. But in fact it is something quite different in this context. As **Schumpeter** (1934, p.XIX) explains in a foreword to a later edition, he intended to show in this chapter the picture of an economy under unchanged reproduction. The concept behind this construction is that of a particular case of a dynamic economy, namely a *stationary* economy, as a reference point for a subsequent analysis of economic *development*. What **Föhl** (1937b) intended to deliver with his own circular flow analysis was something quite different, namely the a-temporal – but computationally consistent – depiction of a temporary determination of specific economic variables, if not of the whole economy. In this respect his circular flow analysis is neither static nor a dynamic flow analysis but logical consistency analysis as **Föhl** (1937b, p.10) himself insists: if logically consistent, his scheme cannot be "false" (or correct) but only "uninteresting" (or relevant). This judgement refers to the circular flow oriented chapters I-IV, "part I" of his book. But if these are the groundworks of his analysis, then changes in the variables thus determined are not dynamics, as Föhl suggests in the subsequent part II of his book where he analyzes changes in the variables determined in the context of his circular flow analysis. They are "comparative statics" in a purely logical sense, as (**Föhl**, 1955, p.XIV) was later to admit in the second edition of his dissertation.

These terminological and analytical conundrums connected with his circular flow analysis are not entirely of Föhl's own making, however, as we will realize when briefly returning to **Schumpeter** (1911) . In an appendix to his "circular-flow"–oriented introductory chapter,

Schumpeter (1911, pp.75–87) traces this concept to the Physiocrats and postulates that relating the circular flow *"ipso facto"* relates the static economy (*ibid.* p. 29) although he confesses deep dissatisfaction with his own usage of the term "static" in this context (*ibid.* p.75). Eventually, **Schumpeter** (1934, p.XX) disassociated himself from this – as he then comes to call it – "outdated" chapter but it was the admittedly "outdated" version which had to serve as one of the analytical quarries for **Föhl** (1937b) . After Schumpeter renounced his own analysis, he himself may be taken as witness that he did not supply readily usable building blocks for Föhl's project of a modern circular flow analysis. Maybe part of Schumpeter's favorable judgement on Föhl is also an acknowledgement of shared responsibility for analytical deficiencies. In any case, if historians of economic thought desire to appreciate the problems posed by circular flow analysis at the time of publishing the *General Theory*, they should remember the unordered state of conceptual affairs which **Föhl** (1937b) inherited from an author like (**Schumpeter**, 1911, ch.1). [35]

6.2 Money, capital, and prices

Föhl (1937b) dismisses Irving Fisher's quantity theoretic "Equation of Exchange" not so much for the above stated (tauto–)logical reasons but rather for paradigmatic ones: in his scheme of thought the most interesting nexus for monetary analysis is not the relation between money and prices but between money and capital. It is in *this* regard that **Schumpeter** (1911) becomes one of the important analytic guides for Föhl, in spite of his rather diffuse conceptions of circular flow analysis which we had occasion to comment upon in the last section.

But **Föhl** (1937b, p.106) considers **Schumpeter**'s (1911; p.156) own rejection of the quantity theoretic arguments as being besides the relevant point of this matter. Schumpeter refers in this context to the "long period" when the newly created productive capital which was financed by newly created money had "matured" and resulted in increased productivity which "overcompensates" the initial price effect associated with monetary expansion. Thus it seems that Schumpeter does admit the possibility of a short-period inflationary effect in the quantity theoretic sense and it is this very point which needs refutation according to

[35] This chapter is a puzzle not only with regard to Schumpeter's own understanding of "statics" and "dynamics" in this context but also because of a puzzling conceptual context which Schumpeter constructs in this connection: In a footnote he refers the title of this chapter to "an expression" in the introduction of the once "deservedly successful" (**Schumpeter** 1954, p.547, n.5) textbook of **von Philippovich** (1895). But no part of Schumpeter's title has a clear connection to the passages he refers to. In particular, the central concept of "circular flow" is not appreciated by **von Philippovich** at all. In fact, in **von Philippovich** (1893, pp.55-57), in a detailed discussion of the Physiocrats, we find this term used not once. This does not accord well with **Schumpeter** (1911, p.79) who claims that establishing the circular flow was their single purely scientific aim. According to **von Philippovich** (1893, 56) the center of the Physiocratic system was the determination of the price of grain. In short, the whole discussion of **Schumpeter** (1911, ch.1) seems to be quite alien to his supposed inspirer. Particularly the distinction between statics and dynamics so much discussed by Schumpeter in the appendix to this chapter, is expressly denounced by **von Philippovich** (1911, p.vi) as being unhelpful for the problems of teaching and practicing of economics. Thus we have quite clear implicit and explicit indications that there is no terminological nor analytical kinship between **Schumpeter** (1911, ch.1) and **von Philippovich** (1895, Introduction).

In view of **von Philippovich**'s (1883; p.48) express rejection of the treatment of economic method by **Schumpeter** (1908) "as a far too narrow treatment of the problem", **Schumpeter**'s (1911, p.1) own reference to this very author has more the air of defiance than of intellectual kinship. In any case, it is most unhelpful for clarifying the economic concept of "circular flow".

Föhl (1937b, pp.107ff.).

In order to argue his case he singles out **Neißer**'s (1928) treatment of money demand and the price level. (**Neißer**, 1928, p.134ff.) argues that the quantity effect on produced goods of newly created money must be so large that it is unlikely to materialize. Föhl's main counter argument is that prices are cost determined and that as long as wage costs are constant, nothing will happen with prices (e.g. **Föhl** (1937b; p.149) in the first place. Thus, **Föhl** resorts to the same argument as **Keynes** does in the *General Theory*. He supports this cost argument with an extended circular flow analysis of newly created money. From this it emerges that the newly created money can very well be passed on at constant prices thus alimenting an increased *real* stream of payments between enterprises and owners of factors of production (**Föhl** (1937b); p.129). The difference to **Neißer** appears then as a purely definitorial one because **Neißer** defines only that amount of money to be "newly created" which is in excess of the reflux in the circular flow. But this "differential definition" of new money is besides the very point of meaningful macroeconomic analysis, according to **Föhl** (1937b, p.132, n.23), namely a scrutiny of the effects of newly injected money while taking into account the circular flow of payments and thus the effect it generates exactly under that condition of triggering a reflux in a new circuit of payments.

Having thus discarded the old quantity theoretic arguments in a way which is quite independent of **Schumpeter** (1911) and which explicitly covers **Neißers** (1928) argumentation, **Föhl** is now free to bring home that part of **Schumpeter**'s *Theory of Economic Development* which he considers to be truly novel.

Föhl (1937b, ch.III) prepared the ground for this message already before his criticism of the quantity theoretic school – after having first given due credit to Schumpeter for the view that the deeper meaning of the creation of money lies in its facilitation of economic development (**Föhl** (1937b, ch. III, sect. 1). In the wake of this declaration we have some detailed treatments of the bank credit multiplier which **Föhl** (1937b; p.84) develops in critical juxtaposition to **Nöll von der Nahmer** (1934) whom he charges with mixing up increases in the transactions demand for money which do require new money holdings with such instances in which new money holdings – and thus monetary expansion – are not required.

After a detailed discussion of the spectrum of capital concepts in use (**Föhl** (1937b), fig.18, p.91) he returns to the issue of capital and finance by drawing attention to the fact that banks which finance investment thereby incur long-term commitments as creditors while having short term commitments as debtors themselves. **Föhl** (1937b; p. 386) therefore advocates specialized institutes as financiers of stabilization relevant expenditures because otherwise there might be a conflict between the exposed position of the financing institute on the one hand and the supervisory central bank on the other.

We refrain from probing deeper into this type of argumentation, siding with **Pedersen** (1957, 5*) who, referring to **Föhl** (1937b, ch.III and IV) judges these more practical discussions of monetary matters as having been "undoubtedly .. of great importance" when they were first published by **Föhl** (1937b) but subsequently to have become superfluous as a topic for detailed discussion in a macroeconomic context.

6.3 Money rates of interest and profits

There is one area of economics where even such a favorable critic like **Pedersen** parts company with **Föhl**: his theory of monetary interest rates and profits. It is not the general

thrust of Föhl's monetary arguments which is at steak in this context. There is general agreement that Carl Föhl had much the same ideas as Keynes on the monetary determination of interest rates, on liquidity preference (although maybe not quite that clearly stated) and on the irrelevancy of the quantity theory of money. Thus we will not cover this area here again in any detail.

But insofar as Föhl deviated from this body of by now generally accepted doctrines, he seems to have gone astray. It is this aspect which should now find closer consideration. One particular aspect of his theory seems to be utterly problematic: **Föhl**'s doctrine that "entrepreneurial profit is independent of the rate of interest" (**Föhl**, 1937b, p.216) or, as **Föhl** (*ibid.* p.217) put it more vividly:

> "As high as we may fix the rates of interest, this is without influence on entrepreneurial profit: it swims on top of the rates of interest."

Such passages cause (**Pedersen**, 1957, p.9*) great discomfort:

> "I must admit that I on my part can not see the usefulness of this piece of analysis, nor the validity of the assumptions on which it is based. Föhl argues at length against such authors as Schumpeter, Keynes and several others who have maintained that interest is paid by the entrepreneur out of his profit and that change in interest, therefore, affects his calculations of adequate profits and thereby his investment decisions."

The most intriguing thing about this result of Föhl's analysis is that it is not obviously based on a false argumentation:

> "Given the definitions of profits on the one hand and the income of factors on the other on which his scheme of the circular flow between firms and factors is based, I see no flaw in his logic, but to me this is only a proof that these definitions are inexpedient."

Later authors on **Föhl** (1937b) tried to take some middle ground between him and Pedersen. Thus, **Hohn** (1970, p.57f.) relates this criticism in quite some detail but comments that in this regard Pedersen does not pay full justice to Föhl's endeavor to have a global macroeconomic approach. Similarly, **Müller** (1981, pp.164f.) quotes these two commentators and adds that soon after Föhl uttered this problematic doctrine he more or less clearly retracted it again — which really would be rather strange if Pedersen was right in stating, as just quoted, that there is no flaw in its logic. We emerge from this debate with the impression that none of these authors were able to relate to others that they themselves did indeed understand the logic of Föhl's mysterious doctrine about interest rates and profits, let us name it the "Föhl effect" of interest, for short.

In fact, the logic of the Föhl effect of interest rates is the same as the one of the so-called "Keynes effect" of wages described in ch.19 of the *General Theory*.[36] What Föhl does in the lengthy passages which Pedersen objected to above is to insist that interest rates are a contractual cost element for entrepreneurs in the same way as wage rates are. This does not come out quite clearly in conventional models of the firm because they mostly rely on an a-temporal conception of production. We did likewise in formulating our basic model of equ.15 (p.17). If we remedied this simplification by considering output to be, say, one time period removed, we must take account of the passage of time by introducing a discounting

[36] There is general agreement among readers of **Föhl** (1937b) that he himself (*op.cit.* pp.159-60) was a co-discoverer of this effect which he named "wage-deflation of consumer prices"; see, *e.g.* **Müller** (1981, pp.166-7).

term. In the most simple version this will be ruled by the nominal interest rate z. Assuming capital to be given as $\bar{K}_i$ we get the profits equation

$$Q_i = \frac{p}{(1+z)}\mathcal{O}_i(N_i, \bar{K}_i) - wN_i - r\bar{K}_i \tag{45}$$

with the profit maximal real wage *cost unit*[37]

$$\frac{\partial \mathcal{O}_i}{\partial N_i} = \frac{w}{p}(1+z) \quad . \tag{46}$$

Now let us recapitulate the argument underlying the "Keynes effect": it states that if the marginal product of labor is given on the left-hand side of equ.46, then a rise in wages must *cet.par.* result in a rise in prices. Prices *can* rise because the rise in wages will be passed on in the economy as increased income and increased demand. Therefore the initial assumption of a constant marginal product of labor can be considered as being justified.

What Föhl now did in this context was not only to independently relate this type of argument but to extend it, claiming (**Föhl**, 1937b, p.218):

> "Wage rates and interest rates are completely symmetric".

Thus, in equ.46, raising the interest rate z while keeping the marginal product constant must *cet.par.* result in a rise in prices. Prices *can* rise because the rise in the rate of interest will be passed on in the economy as increased income and increased demand. Therefore the initial assumption of a constant marginal product of labor can be considered to have been justified.

The outcome of the "Föhl effect" as well as that of the "Keynes effect" is that profits are always in equilibrium, maximal and constant (at the level of zero in case of perfect competition). Profits indeed "swim on top of the rate of interest" as Föhl was just quoted above.

This result is not the outcome of some mysterious slight of global–analytic hands as a number of authors just were seen to seem to have believed but it is sound microeconomics. In fact, it is one of the complaints of practical entrepreneurs that intellectual economists do not pay sufficient attention to the factual working of what we here called the "Föhl effect". But its working seems to be so little received that these complaints find only rarely entry into publications. One notable exception is the American economics magazine *Challenge* which at the time of double-digit prime rates in the 1980s published an economic "parable" by George F. **Brockway** (1989), one-time CEO and editor at the W.W. Norton & Co publishing house. This parable is about a manager who, out of own experience "growl[s] when he reads in the newspaper that the way to stop inflation is to raise the interest rate." It relates in some detail the reaction of that manager to an unforeseen rise in interest rates. It reads like a fuller discussion of our equ.46: On receiving the notification of a steep rise in interest rates the manager

a) cut some salaries and other contractual costs (lowered w),

b) cut back some production runs (raised the marginal product by cutting output),

[37] This term is taken from **Keynes** (1936, p.302) where it is acknowledged that "the" wage unit can only be treated as an *approximation* for marginal prime cost. In addition to wage cost, Keynes advocated foremost the inclusion of "user cost" in order to give a fuller picture of marginal prime cost. But neither these nor marginal financing cost of factor remuneration outlays were included systematically into modeling the Keynesian system. It is the latter which equ.46 depicts along with the "wage–unit" w.

c) laid off some workers (raised workers' marginal product by cutting their input),

d) brought the "Föhl effect" to work:

> "Then they took the company's price list, which covered roughly 2.500 items, and in a matter of two hours raised every price on it."

Thus it seems that the "Föhl effect" does describe real business behaviour and Föhl's invoking circular flow arguments in this connection to the extent that higher interest payments of the one segment of society mean higher interest income of a different segment of society serves just to show that it is very well conceivable that if higher interest rates do result in higher prices, they might very well find higher expenditures to pay for them.

In short, we think that in these much criticized passages relating to the workings of nominal interest rates and their bearing on entrepreneurial behaviour we find much that is helpful to understand economic activity, both, on the microeconomic and on the macroeconomic level. These passages and the decomposition of investor's motives into "expansion" and "substitution" are an important and fruitful specificity of Föhl's theory.

We conclude therefore that when **Pedersen** (1957, pp.9*/10*) finishes his above quoted criticism with the remark:

> Föhl's "distinction between two kinds of investment: expansion investment and substitution investment and the whole artificial analysis to which it leads is not an improvement of the Keynesian system but rather the opposite and it should be abandoned."

then the opposite of what is stated in this quote is true: if we may hope to improve on the old established Keynesian system we should aim to model in far more detail the constraints which determine entrepreneurial behaviour in different stages of the business cycle. In such an attempt the "Föhl effect" and Föhl's decomposition of the different facets of investors' motives supply an interesting guidance to un-orthodox macroeconomic theories which do not defy microeconomic analysis.

7 Conclusion

From a present-day vantage point, Föhl's contribution to monetary economics might be read in a variety of ways.

- With a very broad historical perspective, his writings will appear as being one of the many contributions to a rich debate which went on among German economists at the time between the two World Wars; but
- with a more narrow perspective, focusing on origins and precursors of more recent monetary analytic paradigms, it could well appear as being a singular piece of monetary and macroeconomic analysis which ought to be seen in relation to one particular school, namely that of John Maynard Keynes.

Both of these aspects were covered in this contribution, but it was the latter approach which took the main part of this paper. We chose it not least because we considered it to be most interesting to a modern readership to learn whether there were resp. whether there are – historically resp. logically speaking – analytical alternatives to orthodox textbook views about the economy. Let us also remember in this context that **Schumpeter** (1954) expressly recommended to read Föhl's book in juxtaposition to Keynes's *General Theory* because of its

"apparently un-Keynesian approach". The present paper showed that this characterization must be read with care: we must discern between appearance and substance and we found out that much of the substance of **Föhl** (1937b), in spite of a different appearance, is indeed very Keynesian. But the roots of this "Keynesianism" antedate the *General Theory* and the offsprings go beyond it.

What can be learned from such a finding? There are two headings under which this question can be answered, namely

- clarifying the history of *Keynesian* economic doctrines, and
- establishing a spectrum of analytical approaches which offers *alternatives* to those which we may find in Keynes's original writings.

Under both headings, the present paper may claim to offer some new insights.

With regard to the first of these, the doctrinal history aspects, the most interesting insights do not primarily concern Föhl but John Maynard Keynes. In the preface to the *General Theory* **Keynes** (1936, pp.xxi f.) writes that the relation to the *Treatise*, written five years earlier, might not be so clear to others: "what in my mind is a natural evolution in a line of thought which I have been pursuing for several years, may sometimes strike the reader as a confusing change of view." This seems to have been indeed a not insignificant concern for Keynes's later readership. In the light of this concern Föhl's book is an interesting case study about a total outsider of Keynes's *entourage* and about *his* "natural evolution of a line of thought" following from the *Treatise*. In tracing *Föhl's* monetary macroeconomic thought which was developed before the *General Theory* was published, this essay shows what really could be regarded as having been pre-shaped by Keynes's *Treatise* on which **Föhl** (1937b) was based. It appeared that the Fundamental Equations of the *Treatise* had a way of directing Föhl's thinking into some sort of "IS-curve" (or, in Föhl's terminology, a z_g-curve) analysis and thence to an income determination analysis. From this perspective, later claims that orthodox Keynesian IS-LM curve analysis was alien to "the economics of Keynes" seem rather unconvincing as far as the IS part of the argument is concerned since this part of later macroeconomic orthodoxy was already implicit in Keynes's earlier writings as is witnessed by Föhl's pattern of *Treatise*-based argumentation.

With regard to the second of the above headings, the *analytical alternatives* offered by Föhl's contribution, we insisted in this essay on the importance which Föhl gave to microfoundations and on the far wider range of entrepreneurial analysis which might be found in Föhl as compared to the *General Theory*. A particularly interesting case in point is Föhl's decomposition of profits as elaborated above in the discussion leading up to equ.40 (p.23). These passages are far nearer to modern "Neo-Keynesians" of the Malinvaud-type and to their "disequilibrium" approaches although this concept was here avoided. Föhl's analysis should not so much be seen as a disequilibrium approach but rather as a fuller version of a constrained maximization approach. A further case of analytical "trans-Keynesianism" in this paper was what we coined the "Föhl effect" of "profits swimming on top of the interest rate" as discussed with reference to equ.46 (p.32). We considered it important to show the microeconomic aspects in all these analytical instances, in order to dispel the repeatedly held belief among commentators of Föhl's theory that its tenets depended entirely on some mysterious global–analytic slight of hands.

Beyond the findings mentioned under the two headings just discussed, there emerged a number of remarkable analytical re-creations which can be found in Föhl and which seem to be discovered by him independently of Keynes as in particular: the "Keynes Effect" of wage

changes, the IS-curve analysis, and the associated disillusionment with Knut **Wicksell**'s doctrine of the "natural rate of interest". They might be dismissed as a doctrine–historical curiosum. Depending on temperament, they might also leave us in awe for the analytical clout of this figure from the history of economic thought.

There are many aspects of Föhl's book which could not be covered here. Thus, it might briefly be noted that in analyzing the circular flow of expenditures, Föhl's analytical intentions were directed at the development of an economic theory of control - but he himself later considered this part of his theoretical efforts to duplicate earlier ones by R. **Frisch** and M. **Kalecki** of 1933 and he laid no claim to originality in this particular context (for a discussion of this point see **Föhl** (1955, XV)). Nevertheless, in a more historically oriented investigation this point could find more detailed attention, as well as the many references to contemporary economists like **Grünig** (1933) **Neißer** (1928) and **Nöll von der Nahmer** (1934) who were rather briefly mentioned above in sect.6.

Comparative statics is the predominant analytical method in **Föhl** (1937b). But occasionally there are truly dynamical sequential period analyses of money supply processes. The economic model employed is a two-sector one with the consumption sector assumed to always work at full capacity (and full sectoral employment). The strongest influences on Föhl were from J.M. Keynes's *Treatise on Money* , from J.A. **Schumpeter** (1911)and from a critical reception of the period analysis of K. **Wicksell**.

List of Symbols

$\mathcal{O}_1, \mathcal{O}_2$ sectoral output of consumption good resp. investment good, also as $\mathcal{O}_m, \mathcal{O}_n$ used in fig.4 for individual suppliers m, n , first used in equ. (14), page 14

$\mathcal{O}(N, K)$ production function, first used in equ. (15), page 18

$\mathcal{O}(\mathcal{O}_\ell)$ marketed quantity of output as perceived by entrepreneur ℓ with $\mathcal{O}'(\mathcal{O}_\ell) \gtreqless 1$, first used in equ. (27), page 22

α elasticity of production of labor $0 < \alpha < 1$, first used in equ. (33), page 22

β elasticity of production of capital $0 < \beta < 1$, first used in equ. (33), page 22

ΔK_x flow demand for asset K_x, *i.e.* $-(\bar{K}_x - K^s)$, first used in equ. (20), page 20

$\hat{}$ signifies relative change as in $\hat{x} \equiv \frac{dx}{x}$, first used in equ. (37), page 23

λ_i Lagrangian multiplier for an individual producer under capital services constraint, shadow price for additional capital services as expressed in equ.16 , first used in equ. (15), page 18

λ_ℓ^p Lagrangian multiplier for ℓ-th entrepreneur, associated with his conception of demand conditions as expressed by $p(\cdot)$, first used in equ. (27), page 22

$\lambda_\ell^{\mathcal{O}}$ Lagrangian multiplier for ℓ-th entrepreneur, associated with the production function for output $\mathcal{O}$, first used in equ. (27), page 22

$\oslash C_i(\cdot)$ average cost function of an individual producer as used in fig.4, where $i = m, n$

$\rho_{\mathcal{O}}$ output market conditions with $\rho_{\mathcal{O}} = 0$ for perfect (atomistic) markets – see equ.30 for a decomposition of this magnitude, first used in equ. (28), page 22

$_1$ index for variables related with the consumption goods sector, used in particular for Q_1, profits associated with the value of consumption goods V , first used in equ. (2), page 7

$_2$ index for variables related with the investment goods sector, used in particular for Q_2, profits associated with the value of investment goods I, first used in equ. (2), page 7

$_f$ index for variables related to factor incomes (E_f), like V_f = consumption out of factor income and S_f = savings out of factor income , first used in equ. (3), page 7

$_i$ index for any individual economic subject and for the relevant magnitude, first used in equ. (14), page 14

$_j$ index for j-th sector, j= 1,2 , first used in equ. (19), page 19

$_u$ index relating to entrepreneurs, in particular in V_u, consumption by entrepreneurs, first used in equ. (8), page 8

B shift parameter for demand conditions as expressed by the function $p(\cdot)$, *e.g.* income, first used in equ. (27), page 22

$C = C(Y, ...)$ Keynesian consumption function where $C \equiv V$ (see below); first used on p.26 in discussion of fig.5

$C_i(\cdot)$ cost function of the i-th supplier, first used in equ. (14), page 14

$C_i'(\cdot)$ marginal cost function as defined after equ. 14 and used in fig.4

D volume of demand, first used in equ. (30), page 22

E total income, composed of factor income E_f and profits Q, first used in equ. (3), page 7

E_x^y elasticity operator showing the relative change of the dependent variable y in response to a change in the independent variable x, first used in equ. (23), page 20

I investment, first used in equ. (1), page 6

I' factor cost of investment goods output, first used in equ. (2), page 7

K capital , first used in equ. (15), page 18

K_{xi} capital stock supplied by capitalist i for usage of its services by entrepreneurs, first used in equ. (20), page 20

N labor, first used in equ. (15), page 18

p product price , first used in equ. (14), page 14

$p(\cdot)$ demand as perceived by entrepreneur $_\ell$, first used in equ. (27), page 22

p_x price for a particular capital good, first used in equ. (20), page 20

Q profits, first used in equ. (1), page 6

q profit mark-up on factor cost, first used in equ. (13), page 14

Q_s savings by entrepreneurs, see fn.19.

Q_ℓ profit of an individual entrepreneur who is conscious of product market conditions , first used in equ. (27), page 22

Q_{xi} capitalist profits of the $i-$th capitalist holding asset K_x, first used in equ. (20), page 20

r rentals rate for capital services, first used in equ. (15), page 18

r_x rentals rate for services of asset K_x, first used in equ. (20), page 20

S savings ($\equiv \mathcal{S}$ in Föhl's original notation, see fn.19) , first used in equ. (1), page 6

S_Q savings out of profits, see fn.19

V value of output of consumption goods, first used in equ. (2), page 7

V' factor cost of consumption goods output, first used in equ. (2), page 7

w wages for labor, first used in equ. (15), page 18

Y Keynesian term for national income $Y \equiv E$, see above; first used on p.13, see the related discussion in fn.19

z rate of interest on debts, first used in equ. (20), page 20

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