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Macroeconomics**

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Marshall's notion of the representative firm can be read as a macro notion with some resemblance to Keynes' aggregative concepts. Keynes' notions of aggregate demand and aggregate supply are fashioned after Marshall's definitions of demand and supply. Keynes starts with the Marshallian equilibrium notion. The main innovation of Keynes—a conception of macroeconomic analysis as distinct from microeconomic analysis—may be understood as a particular application of Marshall's moving equilibrium method.

Keywords: Marshall, Keynes, moving equilibrium, temporary equilibrium, aggregation, inverse aggregation problem, representative agent, representative firm, aggregate demand, aggregate supply, effective demand

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Introduction¹

Keynes *General Theory* introduced a new form of macroeconomic theorizing into modern economics: His theory contains, more implicitly than explicitly, a view of macroeconomic analysis as qualitatively different from, but related to, microeconomic analysis.² It builds on Marshallian patterns. I shall focus on this general approach to macroeconomic theorizing rather than on the specific set of theories which Keynes proposed. Indeed, simple macroeconomic ideas like the 45° diagram were published prior to the *General Theory*, and the “fixprice” idea—that wrong prices may produce uncleared markets—is not that revolutionary either.³ Still these simplistic readings of Keynes seem to dominate the market to-day, and this tends to obscure and obfuscate the more fundamental contribution of Keynes which, I think, is to establish a view of aggregative analysis by means of stating a theory. To state my view bluntly: Keynes theory as such is a mixed blessing; it is the view of macroeconomic theorizing *implicit* in Keynes' theory which matters most. This essay focuses thus on this general issue which is quite distinct from anything currently labeled “Keynesian.”

¹ Several years ago I visited the Marshall's house in Cambridge. The owner was very kind and showed me around the house and the garden. In the garden there was a little shelter in which Marshall used to sit and think and write. My host pointed out this was amidst vegetable patches and that Marshall must indeed have been an utilitarian since he preferred to look at the vegetables rather than at the flowers. In this spirit, I shall treat Marshall's work as a vegetable rather than as a flower. Actually, a flower should be put into a vase, arranged and illuminated nicely, as the historians of economic thought will undoubtedly do with Marshall's work. In contrast, I tend more to chop it into pieces and mix a salad out of it. In other words, I am concerned here not so much with illuminating the work of the two great masters but rather to put it to use. ² KEYNES (1936, 293) speaks of a “dichotomy between the Theory of the Individual Industry or Firm” and “the Theory of Output and Employment *as a whole*.”

³ For the 45° diagram. see JANTZEN (1935). (I owe this reference to SCHNEIDER (1965, 120).) Christopher BLISS (1975, 210) has doubted that Keynes would have written a book on the thesis that wrong prices may produce uncleared markets.

Enter Marshall. Keynes' view of macroeconomics grew from Alfred Marshall's "Principles." The core concepts of aggregate demand and aggregate supply in the General Theory are conceived in analogy to Marshall's view of demand and supply. The Keynesian analysis builds on the Marshallian equilibrium notion. Further, Marshall hinted occasionally at the qualitative micro-macro difference. His "representative firm" may be seen as an aggregation device. These topics will be tackled in Sections 2 to 6 below after stating in Section 1 how I conceive the aggregation problem. The attempt to disentangle the general view of aggregative analysis from the specific applications in Keynes' theorizing will bring us back to Marshall in a more fundamental sense: Aggregative analysis will turn out to be a specific generalization of the Marshallian moving equilibrium method. I try to sketch this in Sections 7 to 9 below. A conclusion follows.

*The Inverse Aggregation Problem*¹

Aggregation concerns the reduction of dimensions. A high-dimensional "micro" system is to be described in lower dimension by means of an appropriately chosen "macro" system. The aggregation problem is concerned with the question of how to devise an appropriate macro description of a given micro system. The micro system is given and the macro system is to be derived.

If we deal with macroeconomic theories, we are usually confronted with the inverse question: How is the given macro theory related to the "true" but unknown microeconomic processes? In which way are macroeconomic theories, which have not been derived from microeconomic theories by some sort of aggregation, connected to real economic processes? This is the *inverse aggregation problem*. It is pervasive in economics since practically all processes may be conceived as resulting from some underlying processes working on a still lower level of aggregation. Each human being is, after all, a bunch of cells. The inverse aggregation problem is directly related to the "ordinary" aggregation problem: Once an aggregation procedure is given which describes how to derive a macro model from a given micro model, a given macro model may be viewed as being derived by such a procedure from an underlying but unknown micro model and we

¹ This term has been suggested to me by Robert Solow. Previously I have used the term "hemeneutic aggregation problem", see SCHLICHT (1977, 29,93), SCHLICHT (1985, 10, 93), and SCHLICHT (1990, 287).

may evaluate what is implied about real micro processes in postulating this macro model rather than another one.¹

The inverse aggregation problem is thus concerned with the interpretation of macroeconomic theories in relation to underlying microeconomic processes; they are intended to describe the macro surface of micro events. The following observations should be seen from this perspective.

Marshallian Demand and Supply

Consider a market for a single product and denote its quantity by x and its price by p . To fix ideas, take supply first. The *supply price* p^s will be dependent upon the quantity produced and is defined as “the price required to call forth the exertion necessary for producing any given amount of a commodity” (MARSHALL, 1974, 118). If the price p exceeds p^s , the quantity supplied will increase; if p is below p^s , the quantity supplied will decrease. The supply curve links the price-quantity pairs and may be defined as follows:²

Supply. The supply curve gives the price for each quantity such that the quantity supplied just remains constant.³ Algebraically:

$$p^s = p^s(x). \quad (1)$$

Similarly, we may define the demand curve as follows:

Demand. The demand curve gives the price for each quantity such that the quantity demanded just remains constant.⁴ Algebraically:

$$p^d = p^d(x) \quad (2)$$

¹ Note however that a micro model is not “more real” than the corresponding macro model, since both coexist, being different projections of the same thing; see SCHLICHT (1985, 94f.).

² This is, of course, to some extent an interpretation of Marshall, but see MARSHALL (1974, 309-9, 284-6). I have also omitted that the concepts of demand and supply refer always to a given period of analysis

³ More formally, we may state this as follows: For any given quantity supplied x^s and any given price p , let the change over time of the quantity supplied be given by a function f and write $\frac{dx^s}{dt} = f(p, x^s)$. The supply curve $p^s = p^s(x)$ is then implicitly defined by $f(p^s, x) = 0$.

⁴ More formally, we may state this as follows: For any given quantity demanded x^d and any given price p , let the change over time of the quantity demanded be given by a function g and write $\frac{dx^d}{dt} = g(p, x^d)$. The demand curve $p^d = p^d(x)$ is then implicitly defined by $g(p^d, x) = 0$.

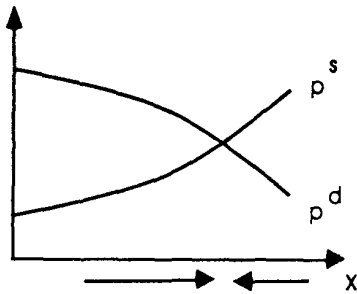


Figure 1

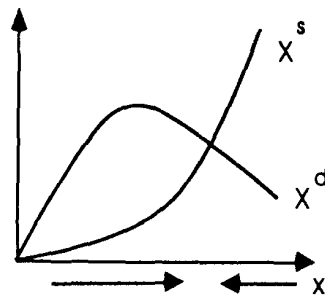


Figure 2

The demand curve gives thus for each quantity x the demand price p^d as a function of this quantity, and the supply curve gives for each quantity x the supply price p^s as a function of this quantity. The Marshallian adjustment mechanism is then the following:

Adjustment. If the demand price p^d is above the supply price p^s , the quantity x supplied in the market will increase and will be absorbed by demand; if the demand price p^d is below the supply price p^s , the quantity x supplied in the market will decrease. Algebraically:

$$\frac{dx}{dt} = \alpha (p^d(x) - p^s(x)), \alpha > 0.$$

This adjustment process leaves open where the short run price will settle. The usual, but not necessary, assumption is to take supply as inelastic in the very short run and to postulate a short-run equilibrium with $p = p^d(x)$ along the adjustment path.¹ We must also assume the demand curve to cut the supply curve from above to achieve stability. Figure 1 summarizes this.

¹ SCHLICHT (1985, 32-6).

Monetary Demand and Supply

We may multiply the quantities demanded and supplied by the relevant prices and obtain a representation of the market in terms of monetary demand and supply. Define these monetary quantities as

$$X^s(x) := p^s(x) \cdot x, \quad X^d(x) := p^d(x) \cdot x. \quad (3)$$

This gives rise to Figure 2. The adjustment mechanism takes now the form that x increases for $X^d > X^s$ and decreases for $X^d < X^s$.

Keynesian Aggregate Demand and Supply

Consider monetary supply for one single firm and index it by i . We may take employment n_i in that firm as uniquely related to the amount produced in that firm, denoted by x_i . Thus monetary supply $X_i(x_i)$ of each firm is a function of employment n_i in this firm. These are the Keynesian “proceeds.”

Consider now a given monetary demand for the products of all the firms and denote it by D . KEYNES (1936, 43f.) postulates now a *given distribution of this monetary demand between the different firms*. In other words, the monetary demand facing firm i , denoted by X_i^d , is a function of D :

$$X_i^d = \Phi_i(D), \quad \sum \Phi_i(D) = D. \quad (4)$$

Given aggregate monetary demand D , we can work back now to employment: By assuming equilibrium in each market, we determine X_i^s and from that employment n_i in each firm. Summing this up yields total employment $N = \sum_i n_i$. The curve which gives for any given level of employment N the aggregate demand D necessary to induce it is the *Keynesian Aggregate Supply Curve*.¹ It may be defined as follows:

Aggregate Supply. The aggregate supply curve gives for any employment N the level of aggregate monetary demand such that production and employment are neither reduced nor increased.

¹ Note that there are other types of supply curves in “Keynesian” economics, e.g. the “Patinkin supply curve”; see SCHLICHT (1979b) for an overview and historical account.

This definition is largely parallel to the definition of Marshallian supply given earlier. The derivation is Keynes' own, with some provisions for user costs left out here. Consider also the original wordings which reveal the proximity of the Marshallian and Keynesian concepts:

KEYNES (1936, 24): "The aggregate supply price of the output of a given amount of employment is the expectation of proceeds which will just make it worth the while of the entrepreneurs to give that employment."

MARSHALL (1974, 118): "... so the price required to call forth the exertion necessary for producing any given amount of a commodity, may be called the *supply price* for that amount ..."

Now turn briefly to the Keynesian concept of aggregate demand. (Don't mix it up with *effective demand*!) I don't want to go too much into detail, and so I present the concept directly:

Aggregate Demand. The aggregate demand curve gives, for any level of employment N , the aggregate supply which would generate proceeds and income such that monetary demand is just equal to the proceeds.

I have stressed in this definition again the *circularity* of the definitions of demand and supply: We obtain the supply function by conceptually shifting the level of demand, and we obtain the demand function by varying supply. These functions make, hence, no sense "out of equilibrium." Compare this definition with the Keynesian phrasing:

KEYNES (1936, 55): "The aggregate demand function relates various hypothetical quantities of employment to the proceeds which their outputs are expected to yield."

We come thus down to a diagram like Figure 2, with x replaced by N . (The modern representation favors x again, but this does not matter).

The adjustment mechanism would be strictly parallel to the Marshallian one: If aggregate demand is above aggregate supply, this will make it worthwhile for the entrepreneurs to increase production, and demand will absorb it; employment will increase. Conversely, if aggregate demand is below aggregate supply, production will be reduced. Keynes preferred not

to deal with the adjustment mechanism explicitly but started from the equilibrium where the aggregate demand curve and the aggregate supply curve intersect. He termed this point of intersection the *Point of Effective Demand*. This is unfortunate since it could have been termed equally well the point of effective supply, but given that terminological choice, Keynes himself is largely responsible for the terminological and conceptual mess caused by mixing up his notions of aggregate demand and effective demand, as it is usual nowadays.

These remarks were intended to illustrate the close similarities between Keynes and Marshall regarding their concepts of demand and supply on the micro and macro levels. It is obvious that Keynes did something quite new, but he built on Marshall. Being Marshall's disciple this is quite natural, but this aspect of Keynes is often neglected.

Equilibrium in Marshall and Keynes

Keynes developed his notions of aggregate demand and supply along Marshallian lines. This builds on the Marshallian equilibrium concept.

To Marshall, economic laws are laws of tendencies: statements regarding the impact of various influences, more or less certain, more or less definite (MARSHALL, 1974, 27). If these tendencies have worked themselves out fully, equilibrium is reached. Hence *Marshallian equilibrium* is a state towards which things are tending. It might be, however, that an equilibrium is never reached since time is required for the causes to work out their effects: "For meanwhile the material on which they work, and perhaps even the causes themselves, may have changed; and the tendencies which are being described will not have a sufficiently 'long run' in which to work themselves out fully." (Marshall 1974, p. 30). But even if this holds true and a moving equilibrium is never reached, the equilibrium may still be helpful to describe the tendencies at work.

This Marshallian equilibrium concept differs from other equilibrium notions, and I mention here only three others:¹ The *analytical equilibrium notion* refers to a rest point, which, if attained, will perpetuate. The notion is closely related to Marshallian equilibrium: A Marshallian equilibrium is an analytical equilibrium which is stable. The *Swedish equilibrium notion* refers to a state where expectations are fulfilled. Things planned *ex ante*

¹ For a more detailed discussion of the equilibrium notion. see SCHLICHT (1982).

are realized *ex post*. The idea behind that is that a disappointment of expectations will lead to revisions of expectations and plans, and hence to changes; in that it boils down to the analytical equilibrium notion, whereas the Marshallian approach, this problem is tackled by distinguishing short- run and long-run equilibria, and the spectrum between them. Thus a short-run Marshallian equilibrium may well result from mutually inconsistent expectations—an equilibrium between bulls and bears for instance—where disappointed expectations may produce changes towards some longer-run equilibrium, but the Swedish notion cannot deal with that. On the other hand, a Swedish equilibrium may be in Marshallian or analytical disequilibrium, since a state might change in a way which is fully anticipated.

The *Walrasian equilibrium notion* refers to market clearance: A market is in equilibrium if demand equals supply. A Walrasian equilibrium can be a Swedish disequilibrium, since agents might expect that markets will not clear, and it can be a Marshallian or analytical disequilibrium if there are tendencies at work which produce uncleared markets. It seems clear that Keynes had not the Walrasian equilibrium notion in mind when writing about unemployment equilibrium. He started from the Marshallian equilibrium notion although he stressed expectations more than Marshall did (HARCOURT and O'SHAUGHESY, 1985, 15-21). This led theorists to believe that Keynes employed the Swedish equilibrium notion, but this is clearly not the case. The analysis of liquidity preference requires an equilibrium between bulls and bears and this is, as has been noted, not compatible with the Swedish approach. In fact, Keynes rejected the *ex ante-ex post* idea quite explicitly (ROBERTSON 1955, 476, KREGEL 1976). It is true that he stressed expectations, but he conceived his curves as dependent upon the state of expectations and not as integral parts of the equilibria to be analyzed. In Keynes, expectations are just shift parameters for Marshallian equilibria.

Liquidity preference theory is not conceivable within the Swedish framework. Moreover, the *ex ante-ex post* distinction could hardly be made in truly aggregate terms, since it builds on plans and expectations, but aggregates have no conscience which would permit them to plan and expect anything. Neither the Walrasian nor the Swedish equilibrium notions lend themselves as naturally to macroeconomic applications and a treatment of the aggregation problem as the Marshallian one.

The Typical and the Representative Economic Agent

Marshall himself was well aware of the aggregation problem, and he introduced the concept of the “representative firm” in order to describe the behavior of an industry by means of microeconomic arguments. The concept has been used in two different meanings, however: Sometimes, he sees the representative firm just as an average specimen of the firms in an industry. I term this a *typical firm*. On the other hand, he used the term in order to describe the behavior of an industry. This is a macro concept in the sense that it is intended to describe the behavior of an aggregate (*i.e.* the industry) without explicit reference to the underlying microeconomic units. I am going to use the term “representative” in the following in this sense only. Generalizing this terminology, we may speak of *typical* economic agents as average specimens, and of *representative* economic agents as theoretically stipulated macro agents.¹

The mixing-up of the two meanings may be illustrated by the following quotes:

Thus a representative firm is in a sense an average firm. But there are many ways in which the term 'average' might be interpreted in connection with a business. And a Representative firm is that particular sort of average firm, at which we need to look in order to see how far the economies, *internal and external*, of production on a large scale have extended generally in the industry and country in question. We cannot see this by looking at one or two firms taken at random: but we can see it fairly well by selecting, after a broad survey a firm, whether in private or joint-stock management (or better still, more than one), that represents, to the best of our judgment, this particular average (MARSHALL 1974, 265).

The causes which govern the facilities for production of a single firm, thus confirm to quite different laws from those which control the whole output of an industry . . . We cannot then regard the conditions of supply by an individual producer as typical of those which govern the general supply in a market.

¹ See also BLISS (1973, 51) and SCHLICHT (1985, 10-12) for this distinction. The German translation of Marshall's "Principles" actually translates "representative firm" by "typische Unternehmung", and I took the term from that source.

We must take account of the fact that very few firms have a long-continued life of active progress, and of the fact that the relations between the individual producer and his special market differ in important respects from those between the whole body of producers and the general market.

Thus the history of the individual firm cannot be made into the history of an industry any more than the history of an individual can be made into the history of mankind. And yet the history of mankind is the outcome of the history of individuals; and the aggregate production for a general market is the outcome of the motives which induce individual producers to expand or contract their production. It is just here that our device of a representative firm comes to our aid. We imagine to ourselves at any time a firm that has its fair share of those internal and external economies, which appertain to the aggregate scale of production in the industry to which it belongs . . . and we look towards a position of balance or equilibrium between the forces of progress and decay (MARSHALL 1974, 379-81).

Both quotations indicate quite clearly what Marshall had in mind: By stressing external economies and the difference between the individual firm and the industry, he introduced the concept of a representative firm as a macro concept, but he linked it to the behavior of the typical firm in an industry. We find the same awareness of a possible micro-macro difference, as well as a desire to link it to the behavior of typical agents in Keynes:

The right dichotomy is, I suggest, between the Theory of the Individual Industry or Firm and of the rewards and the distribution between different uses of a *given* quantity of resources on the one hand, and the Theory of Output and Employment *as a whole* on the other hand (KEYNES 1936, 293).

In a single industry its particular price-level depends on the rate of remuneration of the factors of production which enter into its marginal cost, and partly on the scale of output. There is no reason to modify this conclusion when we pass to industry as a whole. The general price-level depends partly on the remuneration of the factors of production which enter into

marginal cost and partly on the scale of output as a whole, *i.e.* (taking equipment and technique as given) on the volume of employment. It is true that, when we pass to output as a whole, the costs of production in any industry partly depend on the output of other industries. But the more significant change, of which we have to take account, is the effect of changes in *demand* both on costs and on volume. It is on the side of demand that we have to introduce quite new ideas when we are dealing with demand as a whole and no longer with demand for a single product taken in isolation, with demand as a whole assumed to be unchanged (KEYNES 1936, 294-95).

... When employment increases, aggregate real income is increased. The psychology of the community is such that when aggregate real income is increased aggregate consumption is increased, but not by so much than income. Hence employers would make a loss if the whole of the increased employment were to be devoted to satisfying the increased demand for immediate consumption. Thus, to justify any given amount of employment there must be an amount of current investment sufficient to absorb the excess of total output over what the community chooses to consume when employment is at the given level (KEYNES 1936, 27).

Thus Keynes identifies the theory of an industry with the theory of the firm; he points to types of interaction formally similar to the “external economies” stressed by Marshall, which may lead to macro outcomes which are qualitatively different from the underlying micro processes, just as the marginal cost curve of an individual firm might rise if considered individually, but may fall for the industry if external economies are taken into account. The entire story is related to typical behavior on the micro level.

Keynes and the Inverse Aggregation Problem

As I have said, I do not wish to defend Keynes’ theory as such. There are obviously some weaknesses, and the theory does not address the prob-

lem of involuntary unemployment in the modern sense.¹ My theme is the inverse aggregation problem here, and the main issue left open in the argument presented thus far concerns the structure of the aggregates, namely Keynes' assumption that the structure of the aggregates can be taken as given in a specific way, or, in his own words, "that a given volume of effective demand has a particular distribution of this demand between different products uniquely associated with it" and that "a given aggregate employment will be distributed in a unique way between different industries" which ultimately permits aggregation (KEYNES 1936, 43, 45). These kinds of statements may be understood as resulting from a particular application of the moving equilibrium method conceived by Marshall. Since I have dealt with this elsewhere in detail, I will offer here only a brief introduction to my view of the aggregation problem (SCHLICHT 1985, Ch. 5). This view builds on Marshall and may have been in the back of Keynes' head when thinking about macroeconomics, as I tried to document this elsewhere (SCHLICHT 1977, App. A, SCHLICHT 1979a). This is, however, only an interpretation which may be doubted, but if true, it would link Marshall and Keynes in a rather fundamental way.

Marshall's Moving Equilibrium Method

Consider a market. Denote the quantity transacted in the market by x and the price by p . The state of the market will thus be described by the price/quantity pair (p, x) , and this will determine the changes of price and quantity over time:

$$\frac{dp}{dt} = f(p, x) \quad (5)$$

$$\frac{dx}{dt} = g(p, x) \quad (6)$$

Assume now that price adjustment (5) is rather fast as compared to quantity adjustment (6) and leads, for each x , to an equilibrium price

¹ KEYNES (1936, 27,15) defines full employment as that level of employment beyond which employment cannot be increased by an increase in aggregate demand. This corresponds to the modern concepts of the natural rate of unemployment or NAIRU (non accelerating rate of inflation unemployment) rather than to involuntary unemployment in the modern sense. Fifty per cent efficiency wage unemployment. say, would be full employment in Keynes' sense, and any argument for "Keynesian" economic policy measures would be just beside the point under these circumstances.

$p^* = p^*(x)$. We may thus assume in the longer run that p has obtained its equilibrium value and insert this into equation (6) to obtain:

$$\frac{dx}{dt} = g(p^*(x), x) =: h(x). \quad (7)$$

Equation (7) gives the quantity movement independent of price. For each quantity so obtained we may calculate the associated price by plugging x back into $p^*(x)$.

In this way, we have reduced the dimensionality of the system (5), (6) and obtained an approximate solution to the original problem by means of what came to be known as the “moving equilibrium method.” This method can be applied also to dynamical systems, and the approximate validity of the conclusions so obtained can be established under fairly weak assumptions (SCHLICHT 1985, 39-43).

Aggregation and Moving Equilibrium

As I have said, aggregation is concerned with the reduction of dimensions. The moving equilibrium method achieves just that. Indeed, by transforming variables suitably, we may turn the moving equilibrium method into an aggregation procedure. Consider the following example. We want to describe the two-dimensional differential equations system

$$\frac{dx_1}{dt} = f(x_1, x_2) \quad (8)$$

$$\frac{dx_2}{dt} = g(x_1, x_2) \quad (9)$$

by means of the macro variable

$$X = x_1 + x_2. \quad (10)$$

(Assume *e.g.* that (8) and (9) describe some closely related commodities like cigars and cigarettes to be aggregated into “tobacco products.”) Define now the structural variable z which describes the fraction of x_1 in X :

$$z = \frac{x_1}{x_1 + x_2}. \quad (11)$$

The transformed variables X and z and the original variables x_1 and x_2 are uniquely related:

$$x_1 = z \cdot X, \quad x_2 = (1 - z) \cdot X. \quad (12)$$

The differential equations system (8), (9) can thus be described equivalently by a differential equation system in the macro variable X and in the structural variable z :

$$\frac{dz}{dt} = F(X, z) \quad (13)$$

$$\frac{dX}{dt} = G(X, z) \quad (14)$$

with

$$F(X, z) := \frac{1}{X} \left((1 - z) f(zX, (1 - z)X) - z g(zX, (1 - z)X) \right) \quad (15)$$

$$G(X, z) := f(zX, (1 - z)X) + g(zX, (1 - z)X). \quad (16)$$

If the structural variable can be interpreted as fast, we can apply the moving equilibrium method: We calculate $z^*(X)$ by putting (13) to zero and insert this into (14) to obtain an equation in the macro variable X alone:

$$\frac{dX}{dt} = G(X, z^*(X)) =: H(X). \quad (17)$$

In this way, we may describe microeconomic phenomena in macro terms by exploiting in relative speeds of adaption. Note that the macro function $H(X)$ may look qualitatively quite different from the corresponding micro function $G(X, z)$ for any given z .

If we start from a given microeconomic system, the system itself will actually determine the optimal way of aggregation. This has been proved in the linear case in SCHLICHT (1990) and should carry over to the nonlinear case.

Usually we don't have that information, however. We simply start with a macro model and ask ourselves whether it is sensible or not to do so. Here the above view of the aggregation problem would amount to the following argument:

There is a microeconomic system which generates a particular structure of the microeconomic variables: The various firms in construction, which produce substitutes and complements, are for instance affected in a

similar way by the conditions in that industry, and there are many similar parallelisms between industries produced by microeconomic forces. As a result, the microeconomic system will be structured in a certain way, and we may presuppose such a structure. This will permit aggregation. Our macroeconomic models should thus be interpreted such that they always built on microeconomic processes with a determinate structure. Note that this hidden microeconomic structure is not supposed to be rigid, as illustrated by the structural variable z in the above example. Structure is simply assumed to be in equilibrium in the Marshallian sense: Short-run tendencies have worked themselves out. (No *ex ante-ex post* stories involved here).

Conclusion

Marshall and Keynes belong together. Marshall's notion of the representative firm can be read as a macro notion with some resemblance to Keynes' aggregative notions. We find also the desire to link macro behavior to typical microeconomic behavior, and even to confuse these things to some extent in a desire to implement the "Cambridge didactic style." Keynes' notions of aggregate demand and aggregate supply are fashioned after Marshall's notions of demand and supply. Keynes starts with the Marshallian equilibrium notion. The main innovation of Keynes—to introduce a systematic way of thinking about economic aggregates with reference to the underlying microeconomic processes—may be understood as a particular application of Marshall's moving equilibrium method.

Keynes elaborated only certain aspects of Marshall's thought. There is also the sociological Marshall who wrote about the "growth and decay of custom" and speculated how economic forces may evade a custom "by gradual and imperceptible changes" or that a custom may work cumulatively and "therefore exert a deep and controlling influence over the history of the world" (MARSHALL 1974, 640, 665). This Marshall needs perhaps another disciple of Keynes' stature.

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