

A list of Working Papers on the last
pages

No. 116, 1983
Schumpeterian Dynamics
by
Erik Dahmén

Paper presented to the IUI Conference on:
The Dynamics of Decentralized (Market) Economies
Stockholm-Saltsjöbaden, Grand Hotel
August 28 - September 1, 1983

Sponsored by:
**The Marcus Wallenberg Foundation for International Cooperation
in Science**
and organized jointly by the Industrial Institute for Economic and
Social Research (**IUI**) and the Journal of Economic Behavior and
Organization (**JEBO**).

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December, 1983

ABSTRACT

by E. Dahmén

The main purpose of this paper is to define "Schumpeterian dynamics" and to indicate how it can serve as a basis and starting point for studies in development economics irrespective of how Schumpeter used his general approach and what kind of hypotheses he launched.

Schumpeterian dynamics is characterized by its focus on economic transformation. This implies that the main interest is in causal chains outside the scope of macroeconomic growth analyses, namely in disequilibria and chain effects created i.a. by entrepreneurial activities, market processes and competition as a dynamic force. The micro underpinnings of such analyses therefore differ from those of growth models which deal with aggregates, such as investments and saving, productivity, income distribution, wage shares in value added, and capital/output ratios. Seen through Schumpeterian glasses, the micro units have no well-defined generalizable "propensities", and they are not fully informed calculators reacting in a mechanical way to prices that they cannot influence. Instead, firms continuously seek new information and often search for projects which, if carried out, exert transformation pressure on the markets. Consumers can also actively influence firms and markets and do not only passively react to supply prices.

Transformation analyses should not replace macroeconomic growth models, but a change of roles is called for. Such analyses have too long and too often been regarded as empirical complements to growth analyses and therefore as belonging mainly to the domain of economic historians. The stress on "complement" instead of "alternative" implies that some sort of a synthesis should be sought in theoretical as well as in empirical research.

SCHUMPETERIAN DYNAMICS

Some methodological notes

by

Erik Dahmén

The main purpose of this paper is to define "Schumpeterian dynamics" and to indicate how it can serve as a basis and starting point for studies in development economics irrespective of how Schumpeter used his general approach and what kind of hypotheses he launched. "Basis" and "starting point" should be stressed because by developing his conceptual framework areas can be opened up for theoretical and empirical research which so far have been covered only to a comparatively small extent. One of these is the dynamics of decentralized market economies. Particularly in view of what has happened in mixed economies in recent decades and especially in view of frustrating policy experiences it is worth raising the question whether important aspects of economic developments, particularly those connected with networks of micro-macro links, have been too much neglected in mainstream theoretical and empirical research. If the answer is in the affirmative, it is timely to emphasize Schumpeterian dynamics which is concerned exactly with the micro-macro links. It also offers great flexibility to explore a broad range of historical and social science issues.¹

TRANSFORMATION

Schumpeterian dynamics is characterized primarily by its focus on economic transformation rather than on economic growth, defined as an increase in "national product", "capital stock" and other related broad aggregates. It contrasts not only with Walrasian macroeconomic equilibrium theory but also with neoclassical and postkeynesian macroeconomic growth models. Though "dynamic"

according to generally accepted terminology such models do not analyze underlying processes at the micro level and in markets but instead relations between a number of broad aggregates and the result of such processes. This means that changes and disequilibria at micro levels as well as the processes they depend on and give rise to (besides smooth equilibrating adjustments) are left out. They therefore differ from Schumpeterian dynamics even in cases where statistics are disaggregated to give a more detailed picture of facts.

The following phenomena create pressures that are bound to bring about transformation:

- Introduction of new methods of producing and of marketing products and services.
- Appearance of new and marketable products and services.
- Opening up of new markets.
- Exploitation of new sources of raw materials and energy.
- Scrapping of "old" methods of producing and marketing products and services.
- Disappearance of "old" products and services.
- Decline of "old" markets.
- Closing of "old" sources of raw material and energy.
- Formation of new "institutions", i.e. political and organizational structures and systems, legal framework and compliance procedures, patterns and importance of organized interest groups etc. Even political ideologies and social norm systems are sometimes so deeprooted that it may not be farfetched to let them be covered by the concept of "institutions".
- Scrapping of such "institutions" after a usually rather long period of tension between them and technical and economic changes.

Transformation thus includes both economic growth and decline but a conceptual distinction is instrumental. This is because transformation analyses focus on causal chains outside the scope of growth analyses namely on disequilibria and chain effects created

i.a. by entrepreneurial activities, market processes and competition as a dynamic force. The micro underpinnings of such analyses therefore differ from those of growth models where the main interest is in aggregates, such as investment and saving, productivity, income distribution, wage shares in value added, and capital/output ratios and things like that. Seen through Schumpeterian glasses, the micro units have no well-defined generalizable "propensities", and they are not fully informed calculators reacting in a mechanical way to prices that they cannot influence. Instead, firms continuously seek new information and often search for projects which, if carried out, exert transformation pressure on the markets. Consumers can also actively influence firms and markets and do not only passively react to supply prices.

What has now been said should not be taken to mean that transformation analyses ought to replace macroeconomic and neoclassical growth models. Such models, though according to Schumpeter "flimsy structures based on arbitrary assumptions", should be seen as complements to transformation analyses. This would mean an appropriate change of roles because transformation analyses have too long and too often been regarded as mainly empirical complements to growth analyses and therefore as belonging mainly to the domain of economic historians. The stress on "complement" instead of "alternative" implies that some sort of a synthesis should be sought in theoretical as well as in empirical research. Transformation analyses give insights into really dynamic developments but macroeconomic and neoclassical models are important for understanding other aspects. Furthermore, there are such things as "fallacies of composition" which macroanalyses are designed to avoid. On the other hand macroanalyses run considerable risks of missing important points and even of misreading actual events.

FALLACIES OF AGGREGATIVE THINKING

That "fallacies of composition" can be avoided by macroeconomics is too wellknown to need exemplifying. I shall instead draw attention to some "fallacies of aggregative thinking" as an introduc-

tion to the presentation of some examples of Schumpetrian dynamics. The choice is not arbitrary because it has been inspired by experiences from Swedish research and debate.

Unit labor costs (ULC) time series are often used as indicators of competitiveness. Such macroanalyses may be very misleading. ULC aggregates do not show reductions in overseas transport costs that have made foreign products cheaper than before. They do not indicate that new entry of foreign competitors performing at much lower ULC levels can result in rising absolute cost differences, even when the new competitors' rate of increase in ULC is faster. Furthermore, and most important, not even a smaller rate of increase in ULC than that of a group of competitors is a certain indicator of improved competitiveness, if new products constitute an important element of the competitiveness of foreign competitors. These examples suffice to make clear that only ULC series covering short periods and showing substantial divergencies may be reliable indicators. If transformation has changed the composition of the aggregate substantially, they are not. Schumpeterian eyeglasses do not miss such things.

Another ambiguous component of many macroanalyses is the "terms of trade". "Improved" terms could have very different consequences for the economy if prices have fallen of raw materials which are imported than if there has been a decrease in prices of imported goods that are produced also at home. That is so especially to the extent that there are difficulties in reallocating resources and comparatively weak entrepreneurial spirits and dynamism. Transformation analyses focussing on rigidities, time lags and on the "supply" of entrepreneurship are not likely to miss this point.

Aggregated series of profitability and equity/debt ratios used in connection with macroeconomic analyses make it easy to disregard the fact that business firms whose profitability has deteriorated so much that they have been forced to close down have disappeared from the statistics. Furthermore, aggregative thinking

easily underestimates the gravity of deteriorating profitability and equity/debt ratios if not only bridging recessions but also renewing the production has become a more pressing task than before. Transformation analyses can hardly fail to observe such relevant circumstances.

In summing up I assert that macroanalyses are sometimes trapped by the availability of statistical series that statisticians have defined and calculated to serve traditional macro theory. In view of this econometrics, with all its merits, has sometimes done development economics a disservice. Such risks can be reduced by emphasizing transformation and by letting macroeconomic and neo-classical models be complements to transformation analyses rather than the other way round. Unfortunately transformation analyses often have a drawback of their own, namely difficulties of getting access to adequate empirical material, all the more as this sometimes requires both interest and training in historical research on microlevels beyond the range of the great majority of general economists.

ENTREPRENEURIAL ACTIVITY

So far this paper has sketched some general characteristics of transformation analyses. A few examples of easily misleading thinking in aggregates have been mentioned. This has been done in order to clarify a methodological point and to pave the way for some concrete examples of Schumpeterian dynamics.²

A vital role in transformation processes is played by entrepreneurial activities. To catch part of their essence it is appropriate to start with two basic definitions.

The concept of innovation is usually associated with more or less spectacular technological and technical advances, but experiences from actual studies in industrial development make it quite clear that the concept has to be broadened to include the multitude of small day-to-day improvements on the shop floor. The best choice

is to let the classification of innovations be guided by the extension and importance of their impact on markets instead of by their degree of novelty or to what extent they help explaining business cycles. Empirical research indicates that the combined importance of a great number of minor improvements made in everyday work is often underestimated compared with that of great innovations. This may be a certain disproof of Schumpeter's specific business cycle theory but it does no harm to Schumpeterian dynamics.

Schumpeterian dynamics makes it natural to use a broad concept of "investment" and to actualize other causal chains than those connected with "hard" investments and their size in relation to the national product and with capital/output ratios. The focus on entrepreneurial activities is bound to draw attention even to "soft" investments which should include R&D, establishing of sales organizations, marketing etc. Even purchases of other enterprises should in some cases be regarded as investments in a macro context, if the new owners are able to make combinations which could release potentially dynamic forces. This has come to play a great role in times of strong transformation pressures and tight credit markets.

Entrepreneurs sometimes visualize "development blocks" of complementarities of many technical and economic varieties ex ante and at least parts of the blocks may be completed by one and the same entrepreneur or group of entrepreneurs, sometimes coordinated by financiers. The core of the dynamics often consists of concerted activities on a number of fronts by entrepreneurs, under conditions of uncertainty, with the aim of creating new markets for their products by investing and by promoting technical progress in other sectors, thus achieving various linkage effects. Equilibrium on subaggregate levels, encompassing parts of the economy, may be reached through an expansionary process, if complementary new techniques are found and introduced and/or specific investments are made. This, however, has nothing to do with mechanisms establishing general equilibrium by optimizing the allocation of given resources.

Development blocks work as expansionary forces through market mechanisms and illustrate crucial micro-macrolinks. Shortened time horizons and lack of finance occasionally may have depressive effects because parts, already in existence, of "uncompleted" blocks may be unprofitable. Usually, however, this is a temporary phenomenon which incidentally might offer good opportunities for those who dispose of sufficient capital. Central planning of development blocks whereby micro units are supposed to coordinate their efforts often fail because market mechanisms are not allowed to play their decisive role. Decentralized information structures characteristic of market economies are usually more effective in "block building". It is also more correct to say that infrastructures which often constitute parts of blocks have usually developed in response to market pressures than to argue that infrastructures have generally initiated market processes.

More often innovations in certain sectors and branches without any vision of a development block ex ante bring about "structural tensions" which are observed ex post in the markets as an opportunity by actual and potential entrepreneurs. In such cases entrepreneurship consists of "gap filling" within the framework of a development block ex post. Also such "gap filling" by activities not coordinated ex ante often require a two way traffic between economic and technical progress. It is far from always a matter of making use of existing knowledge of technical possibilities, in other words of available technology, nor of an "arbitrage", profiting from chances of equilibrating price and cost relations. What often carries the weight is to respond to uncertain opportunities by active search.

Without causing "structural tensions" innovations often give rise to important changes and chain reactions outside sectors where they originally appear. New technology and new techniques and not least new materials often find applications never visualized from the outset of those having introduced them within their sectors of activity. Such novelties therefore may have potentials not only for solving already known problems but also for actualizing

possibilities not envisaged before. In such cases entrepreneurs often are decisively active but what it is all about is far from always a cashing in of profits from what one has just discovered. Newly acquired knowledge may stimulate activities never imagined before. This is an interesting feature of developments in which entrepreneurs, and not only technicians and researchers, play a role.

Innovations not only create chain effects through an interplay between, on the one hand, technological and technical progress and, on the other hand, further entrepreneurial activities which sometimes, though of course not always, are adequately covered by the concept of "development block". They can also have a "destructive" impact that calls for adjustments primarily of a defensive character. To a certain extent this is a reaction described by neoclassical theory in that market signals give rise to adjustments which have already been known as possibilities but have not been called for until now. However, sometimes such adjustments require solutions not known to be at all possible before. In other words, it may not only be a matter of moving to a new point on a known substitution curve but more or less a necessity to explore outskirts of those actually existing and even to establish new ones. The borderline between passive reactions of a defensive nature and active search under uncertainty therefore is often blurred. This is so particularly because a search process initiated in a new situation occasionally opens the eyes to new opportunities which might bring about developments not at all related to the original need of adjustment. Creation may be destructive but destruction may also be creative just as criticism can be either destructive or constructive.

Another example of the possible importance of destruction for creative activities is that rigidities and delays, possibly increased by government subsidies, or by other ways of throwing good money after bad money, in scrapping obsolete production capacities are bound to tie up capital and labor that could be used elsewhere in

a more productive way. It is less observed that potential entrepreneurs might be "locked up". Thus even the supply of human capital, represented by entrepreneurial talents, is reduced. The history of industrial development offers many examples of shut downs and lay offs leading to starts of many new enterprises. Stick and carrot have worked together.

Measuring and analyzing transformation pressures in relation to actual transformation can result in insights into the viability of markets and the adaptability of the economy, thus making it natural to pay attention to "institutional" circumstances and economic policies of more or less decisive importance.

Transformation processes are often based on a two-way traffic between producers and customers in developing new or improved products and services. Even here it is a matter of contacts not only outside the realm of general macroanalyses but also of another kind than those enlightened by neoclassical micro theory. The extent to which initiating dynamic forces represented by entrepreneurial activities are located on the producer side or on the user side is of course different in different branches and changing from time to time. Such differences and changes cannot be found by observing aggregated series of productivity increases in the different branches. One has to step down to micro levels.

This lastmentioned point is partly related to the fact that entrepreneurs are active also in market processes where price changes, i.e. signals from markets as shown by neoclassical theory, far from always dominate the picture. Particularly in recent decades when all distances have been radically shortened thanks to improved communications in a broad sense, and not least because of recent technical trends in industry, many networks exist which connect firms and groups of firms and which make the importance of traditional market signals somewhat less important and persisting price disequilibria a relevant subject of research. This phenomenon is most common within big transnational business enterprises but has appeared on broad fronts even outside them. It should not be mixed up with organized monopolies and cartels because it has to do with other forms of cooperation and coordination.

This sketchy picture of some essential ingredients of Schumpeterian dynamics should not be allowed to give the impression that what may be named primary innovations, including their most discernible chain effects, usually play a dominating role. Rather another impression should be taken to heart, namely, first, that mostly not much is to be gained by attempts to use a distinction between primary and induced innovations and, second, that Schumpeterian dynamics should not mainly be regarded as a business cycle theory. What is important is its enlightening of transformation processes as such. In Schumpeter's basic model primary innovations, appearing on the scene as "Dei ex machina", are the important thing and are also creating the business cycle. But by using his general approach to the study of economic developments in causal analyses, numerous important aspects can be brought into focus. These aspects call for theoretical and empirical research in which in the first place general economics, business economic and economic history could be merged.

The focus on transformation is bound to give financial aspects of transformation processes, touched upon only in passing in the foregoing, an important place in development economics. Aggregative thinking in terms of "investment" and "saving", representing quite different micro-macro links, is of much less use in this respect, particularly when it implies concentrating on the importance of general demand in a macro context. What really matters is that entrepreneurs can dispose of money to reallocate productive resources, i.a. by making innovations. This is one reason why in Schumpeterian dynamics the focus is on credit creation. Credits are created by financial micro units and extended to industrial micro units in many different ways and under many different conditions which together with the supply of venture capital, possibly self-financed, directly and indirectly play a decisive role in all development processes, i.a. in connection with development blocks. A liquidity squeeze and tight credit markets may lead to shortened time horizons which in turn could change uncompleted blocks from being expansionary to being crisis creating. Thus, institutional arrangements are of decisive importance. Primitive in-

stitutional arrangements may prevent saving from result in either consumption or real investments, whereas institutions efficient in establishing connections between savers and investors as well as in creating credit can be efficient also in promoting transformation processes.

WICKSELLIAN CONSIDERATIONS

There is one macro model that is well suited for being not only a complement to transformation analyses, as are a number of growth models, but also for having the financial sphere integrated with such analyses, namely Knut Wicksell's construct to explain long waves in general price levels. Expectations as to the return on planned, or at least seriously considered, investments are regarded as one of the decisive factors for actual investments.

In Wicksell's terminology such expectations constitute the "real" or "natural rate of interest". The other decisive factor is the loan rate ("the money rate of interest") which also influences saving rates. The model can explain cumulative expansionary and contractive processes and integrate them with the banking system's capacity of both credit creation, bridging a disparity between investment and saving, and credit contraction. Later this model was developed by others to an important part of some business cycle theories. To my knowledge nothing has so far been done to adapt its main concepts and contents to development economics. The following tentative lines of thought to that end or, more exactly, to merge Wicksellian dynamics with Schumpeterian dynamics, could possibly be promising.

The "real rate of interest" (n.b. not to be mixed up with the deflated nominal rate of interest) clearly is an "entrepreneurial" concept, sometimes connected with ideas of prospective innovations and possibly also with development blocks ex ante and chances of steps towards finishing uncompleted blocks ex post. As ingredients of a monetary theory, "the real rate of interest" and "the

money rate of interest" as averages are sufficiently instrumental. To be helpful in transformation analyses they are not. In Schumpeterian dynamics it is not averages that count.

In reality, there is of course a wide spectrum of "real rates of interest". The spread is relevant for the character and impact of "transformation pressures" and actual transformation, the latter being influenced by differences in reallocation capacity as determined both by swiftness in adjustments and by the institutional regime for entrepreneurial activities.

The "money rates of interest", constituting the twin factor determining actual investments (as they together determine the "difference rate of interest") are also numerous though fewer than the number of "real rates of interest". This is particularly so considering that different conditions for disposal of capital could be translated into "shadow interest rates", thus widening the spectrum of relevant rates compared with that constituted by the announced ones. Thus even here it is not averages that count.

In sum: pattern and flexibility of "real rates of interests" and "money rates of interests" are of great interest in transformation analyses.

It is interesting to notice that in Wicksell's monetary theory the "money rate of interest" had no direct influence on the "real rate of interest". This was challenged by maintaining that lowered "money rate of interest" in relation to the "real rate of interest" could be expected to have a depressive effect on the latter as the ensuing increase of real capital formation is bound to lower the marginal productivity of capital and thus sooner or later also "the real rate of interest". This was of course a typical neoclassical remark. With Schumpeterian eyeglasses one should rather contend the opposite. Lowered "money rates of interest" and increased availability of capital can be supposed to have a positive effect on the "real rate of interest" because it will make it possible and attractive for many entrepreneurs to lengthen

their "time horizons" and to widen their search for promising projects. And conversely: more expensive and less available capital is bound to force many entrepreneurs (or make them inclined) to shorten their "time horizons", thus reducing the likelihood of finding such projects. Furthermore, long-term commitments are reduced and immediate and small adjustments are preferred to more time-consuming and far-reaching ones. It goes without saying that the monetary as well as other more general policy implications of these observations is quite another issue.

The following empirical evidence gives an example of what can be observed through a combination of Schumpetrian and Wicksellian dynamics:

During the first two decades after World War Two "real rates of interests" were generally high in most industries. Some of them were very high and few were low. The reasons for this are many and wellknown, particularly in retrospect. The "money rates of interest" were generally low for two main reasons, namely the fact that inflationary expectations were not yet widespread and deep-rooted and furthermore because fiscal policies were relied upon in stabilization policy whereas monetary policy was not à la mode. Since the late sixties and particularly during the seventies the "real rates of interests" declined in many industries, even this for a number of wellknown reasons, whereas the "money rates of interests" were stepped up, very untimely in view of what had begun to happen with the "real rates", due to persisting inflationary expectations, declining efficiency of fiscal policies and a renaissance of monetary policy. It is no wonder that the result was a slowdown of economic transformation and growth, especially as there were also increasing rigidities in resource reallocation. Further down the road it became clear in many branches and firms that the deteriorating availability of appropriate capital at an attractive price due to declining self-financing possibilities, short supply of venture capital and tight credit markets had a depressive impact on many "real rates of interest".

NOTES

¹ Due to its purpose the paper does not deal with what Schumpeter may have meant on points where there are, or seem to be, ambiguities. Nor does it discuss who influenced his thinking. It does not even bring up his theory of business cycles and long waves with its integrated credit theory of money or his vision of the future of capitalism. Such subjects are of course interesting and have recently been dealt with by many writers, but they are less important for the purpose at hand than methodological aspects of Schumpeter's general approach and conceptual framework.

² I am aware of the somewhat cryptical character of some of these examples but hopefully they may serve the purpose of hinting at what kind of analysis is characteristic of such dynamics even though no empirical evidence can be explicitly presented in this paper. There is, however, considerable evidence available based on studies in Swedish and Finnish industrial development.

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