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ABSTRACT. In the following paper, we shall focus on the Italian branch of the monetary circuit (or monetary theory of production).
In particular, we shall attempt a *methodical exploration* of the theoretical production of the one who may rightly be considered the founding father of this branch: Augusto Graziani.
We shall do this along three lines. Firstly, in the wake of Lunghini and Bianchi (2003), we shall argue that that of Graziani, far from being a complete model, is presented as a historically "open" scheme, which therefore needs "closure". Secondly, we shall argue that this scheme should be considered as a logical, not historical, re-construction of the functioning of the capitalist economy. Finally, we shall illustrate how such a scheme stands at the highest possible level of abstraction.

1. Introduction

The aim of this chapter is a *methodical exploration* of the theoretical production of the one who may rightly be considered the founding father of the monetary theory of production: Augusto Graziani.
We shall do this along three lines. Firstly, in the wake of Lunghini and Bianchi (2003), we shall argue that that of Graziani, far from being a complete model, is presented as a historically "open" scheme, which therefore needs "closure". Secondly, we shall argue that this scheme should be considered as a logical, not historical, re-construction of the functioning of the capitalist economy. Finally, we shall illustrate how such a scheme stands at the highest possible level of abstraction.
The first step to take in order to be able to give our interpretation of Graziani's circuit is to clarify what it means facing the analysis of reality from a logical and historical point of view. This will allow us to better define the nature of the aforementioned circuit.
It must, however, also be clarified that, when we speak about "logical point of view", we do not intend to deny history (that is, to be more precise: the social-historical becoming) but, rather, to make abstraction of it[1]. Let us try, therefore, to clarify the two points of view in discussion.

• Independent researcher. I owe much gratitude to my friend Stefano Lucarelli for his invaluable work in editing.

[1] Yet, always and in any case on the basis of (historically) determined abstractions. In other words: never trying to build a "pure economy" in the sense of Walras and, above all, of the neo-Warlasians In effect, the neo-Warlasians have a tendency to "naturalise" the market economy.

2. Logical and historical points of view: a clarification

Logical point of view: we try to analyse the phenomenon we are concerned with in its "purity", eliminating all the characters judged as "accidental" that can impede its "deep" understanding. The reasoning conducted on models constructed from the logical point of view, when relevant, tends to lead to counter-intuitive conclusions.

We shall now give an example using some statements by Schumpeter, an Author who, more than others, has reflected on these issues. In Schumpeter we can see how, if from a historical point of view it is the entrepreneur who has access to productive credit, from a logical point of view the causal links should be reversed, namely: who has access to credit is (chosen as) entrepreneur[2]. In essence, be p = "to be an entrepreneur" and q = "to have access to credit"; on the historical level, the relationship between the two propositions is clearly of the type: *if p then q*. However, on the logical level, the direction of the causal link must be reversed: *if q then p*.

It is as if Schumpeter were to say: I know that history exists, but, in building my model, understood as a simplified representation of reality, I do abstract from it in order to show those mechanisms and those dynamics that I consider fundamental and that, if I followed another methodology, would remain in the shadows or would be confused.

Historical point of view: basically, this means looking at phenomena from an *immediate* perspective, as they present themselves in a given moment. And therefore, to treat them also considering as an integral part of them all the "accidental" characters that they inevitably incorporate. The risk, using this point of view, is to produce mere "descriptions of" reality and not "theories about" reality itself.

[2] See Schumpeter, (1934[1911]), chap. 2, in which the entrepreneur is presented as an agent of economic development, and chap. 4, in which it is specified that he, in order to act, must find a "monetary complement" to his action. On this point, see also De Vecchi (1995), p. 5, where we find these words: "Not only is Schumpeter's theory of economic change based on the dual – individual and institutional – nature of decisions, but entrepreneurs and banks contribute to economic change non as independent juxtaposed bodies, but as connected part of a whole". One can still see De Vecchi (1995), p. 27, where it is said that "[w]ithout a credit institution the entrepreneur cannot implement his new combination". Schumpeter himself is, if possible, clearer in the first version of chap. 2 (see Schumpeter (2011[1911]) in which, taking into account the functions of the entrepreneur, he notes that none of them is sufficient to justify the autonomy of decision on production enjoyed by him. The coordination of production factors or the assumption of risk, but also the stipulation of all the contracts under which the business operates or the control of the factory discipline, constitute normal work activities. The ownership of the means of production or the mandate to administer it are the product of development processes that have already taken place and it is necessary to abstract from them if we want to grasp the phenomenon in its "pure" form. Not even the thesis that the individual becomes an entrepreneur as a result of belonging to a particular class can have any general meaning: in fact, according to Schumpeter, a society has difficulty in reproducing itself in the absence of social change and for the purposes of capitalist reproduction there must be a way in which new men are placed in a position to conquer the command of production. Entrepreneurs are these new men and do not constitute a class. Finally, in Schumpeter (1966[1927]), p. 127-130, entrepreneurial dynasties can come from any class, even the working class.

It is clear that the two points of view must not be confused, *i.e.* mixed unconsciously. In fact, when one thinks about some stylised facts, one thing is trying to "make them work" from a logical point of view, another thing is trying to "describe" them from a historical point of view.

To remain within Schumpeter's framework, the mere observation that profit and interest rates exist at all times as a historical reality does not provide any insight into his theoretical assertion that profit, logically speaking, is temporary income and in a hypothetical state of the economy known as the circular flow, the interest rate is zero[3].

It is evident that the transition from a historical to a logical viewpoint can only be achieved through the power of abstraction. Additionally, the competency of analysts is determined by the manner and types of abstractions employed during analysis.

In order to be able to say our bit on Graziani's circuit, it is also necessary to differentiate the levels of abstraction at which the various considerations that we analyse are placed. To do this, we must take up the lesson of Marx, but also of other heterodox economists, for example, Pasinetti.

As far as Marx is concerned, Roberto Fineschi[4] distinguishes four levels of abstraction present in the concept of Marx's Capital (moving from the most abstract to the most concrete[5]): a sort of "zero level", that is, the *simple circulation of commodities*; a "first level", called *generality* (of Capital); a "second level", called *particularity* (of Capital); a "third and last level", called *singularity* (of Capital)[6].

As far as Pasinetti is concerned, instead, it is he himself[7] who explains to us that, in his way of thinking, in order to make an analysis possible, a separation between two levels of investigation (that is: of abstraction) is necessary. There is, first of all (and Pasinetti adds: from the *logical point of view*, not necessarily of the effective elaboration of the model), the necessity of identifying the fundamental mechanisms of the economic system[8]. The construction of this logical scheme at the highest level of

[3] Cfr. De Vecchi (1995), paragraph 3.7, pp. 38-40; and Appendix D, pp. 151-153.

[4] See Fineschi (2013), p. 74. For the problems related to the translation from German, whose discussion is outside the scope of this work, see note 14, *ibid*.

[5] Cfr., for instance, Marx (1993[1858-59]), Introduction, p. 101, where he writes: "[T]he method of rising from the abstract to the concrete is only the way in which thought appropriates the concrete, reproduces it as the concrete in the mind", adding, immediately afterwards, that "[…] this is by no means the process by which the concrete itself comes into being".

[6] In addition, we too have dealt, albeit in passing, with the problem of the different levels of abstraction in Marx. See Veronese Passarella and Baron (2015), note 2, p. 1417.

[7] Cfr. Pasinetti (2007), Part I, Chapter II.

[8] Indeed, in Pasinetti (2007), pp. 36-37 we can read: "I have argued that to render the analysis manageable, a separation is necessary between two distinct levels of investigation. There is first of all (in logical order, not necessarily in order of actual elaboration) the task of singling out the logical foundations of the whole construction. This task […] consists of the setting up of a complete theoretical scheme of an economic system on objective bases, at a level of investigation that appears largely pre-institutional. […] There is, then, a second, separate level of investigation […], which concerns the behavioural relations meant to represent and explain the effective working of actual economic systems, within a well-defined institutional set-up. […] It seems to me that a clear perception of the separation of these two levels of investigation

abstraction is what Pasinetti calls, with a particularly questionable choice of terminology, a "natural"[9] system which, according to him, is placed at the "pre-institutional" level. After that, there will be the analysis at the "institutional" level, which, however, Pasinetti *never deals with*. The levels of abstraction are in any case (at least) two. "Natural" or "pre-institutional", and "institutional".

Moreover, Pasinetti explains, again in the same text, that his model helps to analyse the economic systems that emerged from the industrial revolution, while, committing an interesting anachronism, he affirms that the GE model works, at most, for the economies that existed before the industrial revolution. He even speaks of two different and divergent paradigms[10]: one centred on exchange and utility; the other (his) centred on production and labour. In our opinion, the distinction "pre-institutional vs institutional" should be replaced by that of "institutionally open vs institutionally closed". This is because, on the one hand, if we take the question of the social imaginary[11] seriously, *there can be nothing outside institutions*; on the other hand, instead, it is Pasinetti himself who tells us that he is giving us a theory, at the highest level of abstraction, of production as a circular process (with surplus)[12].

The interesting thing is that, according to Pasinetti, the characteristics of the two paradigms are radically different. And the main difference is that in the model underlying the paradigm of exchange (model of pure exchange of the GE) time is absent, since everything happens simultaneously. On the contrary, the problem faced by the production paradigm (through the institutionally open model) is intrinsically sequential[13].

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would have exerted a great stimulus and would have opened the way to the clear definition of the whole research programme".

[9] Cfr. Pasinetti (2007), p. 36, where we can also read: "I have called this level of investigation 'natural' […]. Keynes's basic ideas about the characteristics of a monetary theory of production, when stripped down to their essential elements, belong to this level of investigation. And so does, at its deep roots, his principle of effective demand. Piero Sraffa's logical scheme of production of commodities by means of commodities also belongs to this fundamental, natural level of investigation".

[10] As Lunghini notes (cfr. Lunghini 2008, p. 112) in his review (written in the form of an essay) on Pasinetti (2007): "[t]he two paradigms thus originate, according to Pasinetti, in historical evolution: the phase of trade is at the base of the paradigm of pure exchange; while the phase of industry is at the base of the paradigm of pure production. This historiographic hypothesis, which contains an anachronism, is one of the many places that make this book of great interest [...]". [*Original*: [i] due paradigmi hanno dunque origine, secondo Pasinetti, nell'evoluzione storica: la fase del commercio sta alla base del paradigma di puro scambio; mentre la fase dell'industria sta alla base del paradigma di pura produzione. Questa ipotesi storiografica, che contiene un anacronismo, è uno dei tanti luoghi che rendono questo libro di grande interesse [...].]

[11] A systematic consideration of the social imaginary is outside the scope of the present work. However, in this respect one can usefully refer to Castoriadis (1998[1975]).

[12] Moreover, it is Pasinetti himself (cfr. Pasinetti 2007, p. 277, emphasis added) who tells us that: "It should also become clear […] that the theoretical schemes erected at the first stage of investigations *cannot be closed*. They must contain a sufficient number of degrees of freedom to allow the insertion of whatever type of rules of behaviour that may then emerge from carrying out the second (the more practically oriented, more down-to-earth) stage of investigation". For an excellent introduction to Pasinetti's economic theory, see Garbellini, Wirkierman (2014).

[13] We have here an important point of connection with Graziani. He also started from the contraposition between simultaneous and sequential analysis and he takes a clear stand for the latter.

Our fundamental idea is that, in order to truly understand Graziani's circuit, we must simultaneously interpret it both as a *logical scheme* and as a scheme which places itself *at the highest possible level of abstraction*[14]. Furthermore, by doing so, we can approach a series of questions which have given rise to infinite *querelles* in the framework of the endogenous approach to money.
But first things first.

3. The circuit as a logical scheme

The circuit, seen as a logical scheme, allows us to come to terms, at a stroke, with captious questions (at least in our view) such as, for example: "traditional" circuit vs circuit in the era of "financialisation"; overdraft economy vs financial markets economy.
In the first oppositive couple, in effect, the fact that banks finance *directly* enterprises at the beginning of production or do so *indirectly* by financing the over-consumption of wage-earners does not change much compared to the logical necessity of the link between money and production or of the need for a banking system for the issue of the (new) money. What changes are the historical accidents: from the "pure" phenomenon to a "spurious" version of it.
In the second oppositive couple, on the other hand, the fact that at the centre of the scene there is market finance instead of the banking system, while not affecting the conceptual centrality of the latter, shows us how, in such an organised economic system, the quasi-money created by market finance (basically: through stock exchange valuation) still needs the "validation" of the Central Bank (here understood *not* as the bank of the State, but as the bank of the banks and the financial system) in order to be able to be fully monetised. Also in this case, we have the passage from a purer version to a more spurious one of the same phenomenon.
The circuit as a (logical) scheme at the highest level of abstraction, on the other hand, helps us to understand some articulations of Graziani's reasoning that are not always clear.
Just to give a striking example: why does Graziani go from a two-sector model to a totally aggregated model, apparently returning in this way to a model isomorphic to the corn-corn one of Ricardian flavour?

[14] From now on, on the basis of Lunghini and Bianchi we shall talk about the circuit "scheme" rather than the circuit "model". See Lunghini and Bianchi (2003), p. 150, where we can read: "The monetary circuit is neither a theory nor a model, it is a scheme as Quesnay's *Tableau économique* (which is the proper reference, since in the monetary circuit scheme there is a time sequence), Marx's reproduction schemes, and Sraffa's equations in *Production of commodities*. These are schemes […] whose analytical power also depends on the fact that they do not contemplate behavioral functions". Furthermore, again in Lunghini and Bianchi (2003), on page 170, we can read: "The monetary circuit scheme remains an open scheme […]. This is a positive aspect of the scheme, rather than a drawback. We could say that open schemes are open to history". The above statements can be read as fully convergent with what we have so far stated. In fact, Graziani's circuit is a logical scheme at the level of maximum abstraction, *i.e.*, to use the Pasinettian terminology as corrected by us, "institutionally open" (what Lunghini and Bianchi call an open scheme, open to history).

Our answer is that, since he is at the level of maximum abstraction, in order to be able to show that the only external purchase that the business sector needs is the workforce of the wage-earners, in reality, a one-commodity/sector model is even better than a two-commodities/sectors model[15]. In this way, in fact, it is incontrovertible that, according to the intrinsic logic of its model, for Graziani the capitalist money is *command over the living labour*. Regardless of the fact that he says and repeats at every turn that money, for him, is basically a means of payment. There is, therefore, a dyscrasia between what Graziani affirms *apertis verbis* and what his model actually tells us. But this is understood *if* and *when* we differentiate the levels of abstraction.

Let us now get to the heart of the Graziani's framework, by analysing its main hypotheses:

1) Graziani's model places itself "at system level", *i.e.* it is intrinsically macro-economic;
2) within this model it is considered a one-period circuit but, given the level of abstraction, this means that we are not interested in what could have been before and that we are not interested in what (eventually) will be after it. Everything must therefore begin and end within of the considered circuit. From what said, it follows that money is a *pure flow*, because, to Graziani's sidereal level of abstraction, in every single circuit, all the money created at the beginning must have been destroyed at the end;
3) the wage-earners spend all their income: either on the market of commodities or on that of securities. *Ergo*: they cannot remain "liquid" (through bank deposits) at the end of the circuit. Moreover, if the securities mature an interest at the end of the period, the wage earners re-invest it in securities; this last assumption causes that, *at the maximum level of abstraction*, the one on securities can be considered a purely figurative interest;
4) the demand that enterprises face is given and there are no problems of liquidity preference on the part of the banks, as well as, *ex hypothesi* 3), there are none on the part of the workers.

[15] The fact that, actually, in Graziani the capitalist money can be interpreted first and foremost as a command over living labour can be seen well in two articles, originally written in Italian in the 1980s but re-published in 1997, after having been translated into English. Indeed, in Graziani (1997a), p. 22 it is said: "In the analysis of the economic process as a money circuit, money appears as an initial loan granted to enterprises for the payment of wages and the purchase of labor power. […] Money is therefore not, as individualist theory would have it, a simple intermediary of exchange introduced as technical refinement, for the purpose of overcoming the inconveniences of barter. In the capitalist system, money is the initial capital of which the entrepreneur avails himself to acquire labor power". While, in Graziani (1997b), p. 26 the difference between exchanges among classes and exchanges within the same class is stressed: "Two order of relations stand out […]: relation of exchange between capitalists and workers–that is, exchange between different and opposite classes–and relations of exchange within the class of capitalists–that is, exchange within the same class. In particular, the distinction that will prove significant is the one that separates the initial exchange between money-capital and labor power […] from the exchanges by which capitalists […] circulate the commodities produced among themselves. This distinction between these two moments takes on major relevance for the theoretical analysis of money […]". It is clear that, for Graziani, what really matters is the initial exchange among classes, which is configured as a monetary exchange. He can therefore conclude his writing by saying: "Wage labor and a money economy are different aspects of the same reality of a capitalist economy" (Graziani 1997b, p. 48). In the light of the above, not only does it seem to us we can affirm that Graziani's uni-sectoral model cannot be reduced to the Ricardian corn-corn model, but also that we may reasonably assume the transition from the two-sector model to the single-sector model can be used to bring out the idea of money as a command over labour.

Therefore, we are totally ignoring the "store of value" function of money. This is useful to demonstrate the relevance of money even *when there is no crisis*;

5) since in Graziani (after some indecisions in the first version of the model[16]) the Central Bank is present but operates only as "bank of the banks (and of the financial system)" and not as "bank of the State", it follows that all the existing money is to be considered "inside money". In the basic model of the circuit, in fact, there is no expenditure in deficit by the State, which, usually, is added at a later time. In this way: i) contrary to what happens among the orthodox, in order to explain the introduction of money, importance is given to the "bank refinancing channel" rather than to that of the "public deficits"; ii) the addition, only in a second time, of the capacity, by the State, to spend without having bought first (privilege of seigniorage), can help to solve the "monetization of profits" problem.

Hypothesis 1) is needed to justify some counter-intuitive results that Graziani arrives at by renouncing the idea that a system can be reduced to the sum of its constituent parts; it therefore allows highlighting some peculiarities, which at first sight may seem paradoxical. The best example is certainly the relationship between the collection of deposits and the granting of loans, concerning the banks. In fact, as we have already seen, if at the level of the individual bank it may seem that to grant a loan it was necessary, before, to have collected a deposit, at the level of the system the causal links go, clearly, in the opposite direction. Graziani formalises the reason for the importance of the collection of deposits for the individual bank, while, on the other hand, with the example (which is, in practice, a real Einsteinian "mental experiment") of the "single bank (serving the entire economy)" he clarifies beyond any reasonable doubt that, from the logical point of view, loans come before deposits – while from the temporal point of view, in the example in question, they can only give themselves simultaneously.

Actually, these apparent paradoxes are what prevent us from falling into "fallacies of composition".

Hypothesis 2) is of paramount importance. In fact, if each circuit has its own life and if every time we start again, it follows that, at the opening of each circuit, there is no accumulated saving. What better illustration of the fact that it is not the *ex-ante* savings that finance the investments? Indeed, for Graziani, even if we consider single period linked circuits,

> while for individuals savings are part of income and form a stock of wealth, for the working class taken as a whole income in real terms is made up only of consumption and accumulated wealth is purely figurative (Graziani (1983), p. 105)[17].

[16] Cfr. Graziani (1983).

[17] *Original*: "mentre per i singoli, i risparmi fanno parte del reddito e vanno a formare uno stock di ricchezza, per la classe dei lavoratori presa nel suo insieme il reddito in termini reali è costituito unicamente dai consumi e la ricchezza accumulata è puramente figurativa".

For Graziani, investments are still financed by savings, which, anyway, is always *ex-post* savings (and it can take the two forms of "voluntary savings" or "forced savings").

The hypotheses 3) and 4) are used to exclude the crises from the analysis, as already mentioned, and to avoid that stocks of liquidity accumulate at the end of each circuit. In this way it is very clear that the endogeneity of money derives from its link with (the financing of) the production, rather than with the portfolio choices of the economic agents (but we shall come back to this in a moment).

The hypothesis 5), finally, tells us that, if we understand the "fundamental principle of Graziani" in a strong sense, there is no possibility that the closure of the circuit will occur[18].

Now, what would happen if, in order to go down in the level of abstraction, we relaxed the above hypotheses? If, for example, by relaxing hypothesis 3), do we allow wage earners to maintain a liquid stock (albeit very small) at the end of the circuit?

First of all, now that there are stocks, we have a connection between periods: we are therefore moving from a level of abstraction in which each circuit is independent to one in which there is a concatenation of one-period circuits. *Secondly*, if we repeat the operation for more periods, we will find ourselves with a stock of money of fair dimensions.

Before continuing, one point should be stressed: as Graziani makes clear in his various writings, the fact that wage earners remain liquid means that enterprises remain indebted to the banks – and for the same amount not spent. If, therefore, the liquid stock of workers increases from period to period, this means that businesses' debt to banks also increases. If we want to maintain the hypothesis of a situation without crisis, we can, alternatively: α) suppose that the banks accept the situation of increasing debt of enterprises, which, therefore, will remain in given number and will not fail, or: β) suppose that some enterprises (both industrial and banking) will fail but will be replaced by new enterprises, of the same type and in the same number of failed enterprises, so that the total number of the employed, made the necessary adjustments, will not change[19].

It is a matter, very clearly, of *ad hoc* hypotheses which, moreover, carry out the same function: to avoid considering, at high levels of abstraction, any possibility of "crisis"[20].

In the initial stages, such hypotheses may be deemed acceptable as they aid our comprehension of a subject we deem of utmost importance. Notably, once the stock of money set aside reaches a certain

[18] On "Graziani's fundamental principle", as well as on the indication of a line of research that can direct us towards a satisfactory solution to the long-standing problem of the closure of the circuit, we will come back shortly.

[19] In this second scenario, we are also implicitly assuming the presence and intervention of the State, which, in the event of bank failures, would act by means of current account insurance. Otherwise, in fact, families would lose the liquidity they had set aside.

[20] And, that it is an *ad hoc* hypothesis, the second version, β, shows it *ictu oculi*.

level, it becomes a sort of buffer stock and can become another channel of endogenous monetary injection. However, this is contingent *on agents' portfolio choices.*

4. Consequences of the differentiation of abstraction levels

First of all, we can see how, by differentiating the levels of abstraction and widening the horizon beyond the theory of the monetary circuit, we can get out of *querelles* which, in the context of the theories of endogenous money seemed insoluble. For instance, is the endogeneity of money connected with (the financing of) production, as circuitists said, and, *mutatis mutandis*, also horizontalists said, or, rather, with the portfolio choices of individuals, as structuralists see it?

Our answer is: with both!

In the sense that, by differentiating the level of abstraction, we can clearly see how, in actual fact, there are two levels or degrees of endogeneity: one, which we will call *primary endogeneity* (since it is what we see at the maximum level of abstraction), effectively has to do with production; the other, which we will call *secondary endogeneity* (since it operates only at a more concrete level of analysis and is therefore, in some way, derived from the first), has instead to do with the individuals' portfolios choices.

The same conclusion can be reached by looking at it from a different point of view. In fact, another long-standing argument between endogenists concerns the "velocity of circulation of money". Should we, in the context of an endogenous money theory, consider this velocity as a constant or not?[21]

Here too, in our view, by differentiating the levels of abstraction, and considering Graziani's circuit as the scheme at the most abstract level possible, these doubts can be clarified. In effect, at the highest level of abstraction we can consider, in the first instance, the velocity of circulation as given. It is as if the (*k*) of the Cambridge equation had a very small but constant value, that is, as if the (*V*) of the Fisher equation had a very high value but not infinite[22]. This is because we are, for the moment,

[21] An Author who, more than others, has posed such a problem is Stephen Rousseas. He, cfr. Rousseas (1998), writes at p. 106, in which he reconstructs the endogenist position of Kaldor (and of Weitraub): "In the case of Kaldor, the exogenous interest rate coupled with the lender of last resort function of the central bank severs the Keynesian link between velocity and the rate of interest. If velocity, however, turns out to be unpredictably variable, as it has indeed been in much of the post-war period, then demand does not totally create its own supply in the real world. In that case the supply response to an increase in demand has been partial. Kaldor allows for partial accommodation only toward the very end of his essay […]".While, at p. 105, he had stated: "The velocity of money, however, has not been constant, or even stable in its functional form, and it is important to note that the Weintraub-Kaldor models […] both assume, in equilibrium, a perfectly elastic, horizontal supply of money curve and thus a constant income velocity of money as a result". Adding immediately after: "In a very un-Keynesian way, it divorces the income velocity of money from changes in the rate of interest. So do the monetarists, but for totally different reasons".

[22] This is particularly evident in the first versions of the model, where workers gradually spend, over the period, the monetary salary received, in equal tranches over time. See Graziani (1984), p. 9.

considering money as a pure flow (so much is introduced at the beginning of the circuit, so much must be destroyed at the end).

If now, relaxing our hypothesis, we allow the workers to remain liquid at the end of the period, then our (k) will increase, while our (V) will decrease. If we repeat the operation for more periods, so much to accumulate *buffer stocks*, we can now consider, even if maintaining the *ad hoc* α or β hypotheses above signalled, but to a more concrete level of the analysis, *also the agents' portfolio choices*. These will act on (V), increasing it if they decide to "throw back liquidity in circulation" or decreasing it, otherwise. An inverse effect with respect to that found for (V) we shall have on (k), clearly.

At this point, if other hypotheses are relaxed, e.g. the 4), and therefore is taken into consideration the liquidity preference of banks, which will hardly be willing to tolerate a growing indebtedness of enterprises (*ad hoc* hypothesis α), on the one hand, we quit a situation, by definition, without crisis, while on the other hand we make the model more and more concrete. And so on...

Secondly, again through the differentiation of the levels of abstraction, we can clarify in a simple way the concept of "credit divisor" as well as the idea that the deposits (possibly) existing at the end of the circuit derive in any case from the loans granted at the beginning of this. In fact, be it:

$$\Delta M^{(\text{end})} = d_I \Delta M^{(\text{beginning})}$$[23]

where: $M^{(\text{beginning})} = L$, while $d_I : 0 \leq d_I \leq 1$, is the "primary" credit divisor (or loans divisor). In effect, if in opening of circuit enterprises obtain a credit, *i.e.* loans, for a total of, say, 100 monetary units (from now on: *m.u.*) while at the end of each circuit households decide to remain liquid for 20 *m.u.* it is obvious that the stock that we shall have at the end of the period is nothing more than a percentage of the credit obtained in opening of circuit.

It is also clear that, given a certain (positive) liquidity preference of the household, it is the (eventual) fluctuations of $M^{(\text{beginning})}$ that generate the fluctuations of $M^{(\text{end})}$. Moreover, if $d_I = 0$ there are no end-of-period stocks (the households' liquidity preference is zero).

Consequently, we can conclude that $M^{(\text{end})}$ has as its next cause the households' liquidity preference (that is, within the scheme of Graziani, wage-earners' liquidity preference) while it has, as a remote cause, the quantity of credit disbursed, that is, the banks' liquidity preference[24].

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[23] $M^{(\text{beginning})}$ is to be considered as the change in a stock whose initial value is 0. So is $M^{(\text{end})}$. In fact, we are moving from a level of abstraction in which all money created at the beginning of the period is destroyed at the end to a (lower) level in which we assume that wage-earners can decide to remain "liquid". In a few lines, at an even lower level of abstraction, we shall ask ourselves what happens when the stock accumulated by the workers arrives at a size so relevant that it can be used as a *buffer stock*.

[24] Clearly, we are referring to a "generalised view" of liquidity preference, similar to that postulated by Lavoie (1996), pp. 290-295.

If now, besides going down in level of abstraction, we widen the horizon beyond the theory of monetary circuit, opening up to horizontalism, we can find further results worthy of interest. In fact, after some periods in which a positive liquidity preference of wage earners is assumed, once the stock of money has accumulated, it can begin to act as a *buffer stock*.
Moreover, if we recall what Graziani said (Graziani 2003, p. 67), namely:

> [T]he followers of the circulation approach […] think that the working of a monetary economy should be analysed first of all in the framework of a market economy consisting only of the private sector. The creation of money is thus analysed in the absence of any government expenditure. As a consequence, the starting point of their analysis is the case in which the monetary base is created only through the refinancing operated by the central bank to meet the needs of commercial banks.

As a result, changes in the monetary stock lead to the introduction of *monetary base*, through the refinancing operations that the Central Bank must carry out in order to meet the payments imbalances among commercial banks. We shall therefore have:

$$\Delta B = d_{II}\Delta M$$ [25]

where: B is the monetary base and $d_{II} : 0 \leq d_{II} \leq 1$, is the "secondary" credit divisor (or deposit divisor). In fact, remembering that the scheme of the circuit at high level of abstraction describes an economy of "pure credit", we shall have: $M = D^d$, where D^d is the demand for deposits.
The above equation is formally identical to the one given, at the time, by Lavoie[26].
To try to clarify the point, remember that any credit a bank A makes to one of its customers is spent partly on the customers of the bank A itself and partly on the customers of other banks (B, C, ...)[27]. Consequently, it is the other banks that find themselves the holders of some cheques issued by bank A. These cheques are presented for collection at the end of the period and Bank A can only set them off if it holds an equivalent amount of cheques issued by other banks. The ratio between the means of payment used by bank A's customers and those of banks B, C, etc. is therefore not secondary.
Let us now put the Central Bank on the scene and reconsider the previous example. Let us suppose, this time, that bank A has a debt of 200 *m.u.* towards bank B but that there is no means of payment

[25] We are considering ΔM and ΔB again in terms of stock variations.
[26] See Lavoie (1984), p. 778. Indeed, Lavoie summarises the post-Keynesian view in the equation: $B = (1/m)M$, where: B is the monetary base; $1/m$ is the inverse of the monetarists' "money multiplier", *i.e.* it is the "credit divisor "; M is the stock of money. He explained that this equation were (at that moment) only implicit in the post Keynesian literature and that the difference between the monetarist money multiplier equation and the credit division equation is that in the latter the causality is running from the banks and public's monetary preferences to the quantity of monetary base.
[27] Unless we are in the entirely hypothetical case where there is only one bank serving the whole of the concerned economy.

available (bank A does not have any cheque issued by bank B). Bank B, on the other hand, holds a cheque of 200 *m.u.* issued by Bank A. This cheque must be settled, but there is no means of doing so (since bank A has nothing to set off). Well, unless the two banks agree to grant each other reciprocal financing, they can only settle their debts if there is a means of payment of a "higher" level. This means of payment is the *monetary base* issued by the Central Bank. The Central Bank grants an advance to A, who uses it to pay B. B thus earns reserves. Exactly as Graziani states (Graziani 2003 p. 66):

When the monetary base is supplied by the central bank to a commercial bank, money is created when one bank goes into debt to the central bank in order to repay a debt to another bank.

Moreover, according to Graziani, there is a direct proportionality between deposits and monetary base. In fact, if households decide to decrease their liquidity, and therefore their deposits, at the end of a period, there will be a consequent decrease of the monetary base:

[if a]t the end of the period, the liquid balances are reduced, as compared to their amount at the beginning of the period, by an amount equal to the amount of expenditure by households in the goods market plus the amount of securities bought by savers[, t]he same [will apply] to bank deposits and to the monetary base. (Graziani 2003 p. 128)

From the above we can deduce that the size of the "secondary" credit divisor (or deposit divisor) *depends*, fundamentally, *on the interbank payment ratios*. Unless the circumstance, completely accidental, that the operations between the various banks are balanced or from the circumstance, particular, which in the case of non-balance the banks are disposed to make reciprocal credit[28], the Central Bank must act as clearing house for the settlement of accounts of commercial banks. *Consequently, such a divisor will normally be positive, irrespective of whether there are reserve requirements and/or the custom of holding voluntary reserves*[29].

If we now broaden the horizon further beyond the theory of the monetary circuit by applying the differentiation of abstraction levels to interest rates, we find additional results that also seem relevant to us.

In fact, as far as interest rates are concerned, recalling what has been said by the horizontalists, the element from which to start, that is, the one that exists even at the highest possible level of abstraction,

[28] In the sense of a postponement of (definitive) payments.

[29] As far as reserve requirements are concerned, it should be noted that, by now, in some countries (e.g. Canada, New Zealand, Australia, Sweden and Hong Kong) they have been abolished; as far as voluntary reserves are concerned, instead, we can make abstractions in the first instance (reintroducing them at a lower level of abstraction) to analyse only the *primary* manifestation of the phenomenon.

is the so-called *base interest rate*, that is, the rate set by the Central Bank. As argued by Lavoie (see Lavoie 1996, p. 278):

> [f]or horizontalists the *base* interest rate is not a market phenomenon: it is a bureaucratically determined price […]. The base interest rate is an administered price […].

This means that the base rate of interest is introduced into the market "from outside".
However, what really matters within Graziani's circuit scheme is the bank interest rate that enterprises pay to access the "initial finance". This rate, on the one hand, is in a Schumpeterian or Ricardian tradition, configured as a cut on industrial profit[30]. On the other hand, instead, as the post-Keynesian literature tells us, it is given by a mark-up fixed by the banks on the base interest rate. We can therefore conclude that, although it derives in the first instance from the power relations in place at the beginning of each circuit between banking sector and industrial sector[31], it is ultimately limited by a "corridor" thus defined:

$$i_{CB} \leq i_B \leq r_{profit}$$

where: i_{CB} is the base rate; i_B is the bank rate, obtained from the base rate by adding a mark-up ($i_B = (1 + M_{up})\, i_{CB}$)[32]; while r_{profit} is, of course, the industrial profit rate.
Finally, as far as i, the rate on securities issued by enterprises is concerned, if we remain within Graziani's hypothesis that, at a level of sidereal abstraction, to workers will be paid in securities the interest accrued on securities, it is purely figurative. If, however, by lowering our level of abstraction, we hypothesise that the wage-earners make themselves pay in "good money", then we have that:
1) The payment of the interest on the securities ceases to be, for the enterprises, purely figurative;
2) The interest rate on securities is governed by liquidity preference.

In any case, *the orthodox theory of interest as the result of individual choices and a reward for abstinence and thrift must be questioned*.

[30] As for Schumpeterian tradition, De Vecchi (1995), at p. 39 reminds us that according to Schumpeter: "[I]interest does not remunerate either abstinence from consumption or active participation in the production process. It originates in the capitalist economy, as a result of the role of money in promoting production with surplus value, and is a 'tax on entrepreneurial profit' […]".As far as the Ricardian tradition is concerned, instead, we can refer to Lunghini and Bianchi (2004), p. 171, where they clearly write: "[In the monetary circuit scheme t]he result is the same depicted by Ricardo in his *Essay on Profits*. Interests […] substantially behave like a bounty on profits".
[31] Or, as Marco Veronese Passarella writes (Veronese Passarella 2017, p. 72, emphasis added): "Given the target rate *steered by the central bank*, negotiations between commercial banks and firms determine the amount of credit (that is, the initial finance) and/or the actual nominal rate on loans".
[32] This mark-up can be fixed or change during the cycle phases. The discussion of these assumptions, however, lies beyond the scope of the present work.

5. On "Graziani's fundamental principle", *i.e.*: guidelines for a possible solution to the "paradox of profits"

Let us now explain the issue of the "Graziani's fundamental principle" properly. If we take this principle in a *strong sense*, it means *not only* that banks cannot issue on themselves (since only the State, and under certain institutional and economic conditions, can do so) *but also* that they cannot, by definition, use bank money. As a consequence, since in Graziani's circuit, at the highest level of abstraction, the only money (explicitly) considered is the banks' one, every reflux of money towards the banks coincides with the destruction of the whole quantity of money that has refluxed.

If, however, we consider Graziani's fundamental principle in a *weak sense*, as it is probably more sensible to do, it only means that banks cannot issue on themselves. Moreover, if we remember the fact that, of the amounts paid by enterprises to banks during the period of the circuit to extinguish their debt, one part represents the "share capital" while another part represents the "share interest", we immediately realise that this last part can be used by banks as their own income, to be spent.

In fact, the explicit consideration of interest as the income of banks, income which, at a high level of abstraction, is assumed to be spent, is at the heart of the "solution" given by Gennaro Zezza to the so-called "paradox of profits", that is, to the *vexata quaestio* of the "closure of the circuit"[33].

Actually, in our opinion, Zezza solves, beyond any reasonable doubt, the problem of the "payment of interest in money", not that of the "monetisation of profits"[34]. Let us try to show why.

According to Zezza (2012), pp. 156-157, firms as a whole need to obtain an initial loan (L_0), equal to the wage bill (W):

$$L_0 = W$$

Money, in the form of bank deposits, is created when firms pay wage earners. Once production is complete, at the level of abstraction considered by Zezza, wage earners may either buy consumption goods (C), or save, increasing their stock of financial assets (V).

The budget constraint of households is thus

$$W = C + \Delta V$$

Zezza assumes that firms finance investment by issuing equities (E).

$$\Delta E^s = I$$

[33] See Zezza (2004) and, above all, Zezza (2012). We certainly do not claim to solve ourselves what, until now, has not been resolved in a fully satisfactory way by anyone. What follows are only "guidelines" for a future work that remains to be done.

[34] This could be because he, using the Godleyian setup of the Stock-Flow-Consistent Model, places himself de facto at a different, and slightly lower, level of abstraction than Graziani: that of the single concatenated circuits, rather than that of the single circuit. Which, basically means that even if we consider a single-period circuit, there was a story before it. On the contrary, at the maximum level of abstraction possible, considering a uniperiodal circuit means that everything must begin and end within the circuit in question. Therefore, for definition there cannot have been accumulation of saving (or wealth). See Godley and Lavoie (2007).

Financial assets are, therefore, given by bank deposits (D) and equities (E). Then it must be

$$\Delta V = \Delta D^d + \Delta E^d + W - C$$

At the end of the production period, firms have to pay back the initial loan, plus interest. Firms' receipts are given by sales of consumption goods plus sales of investment goods (I). Firms' profits (Π) are thus given by

$$\Pi = C + I - W - rL$$

where $r \cdot L$ is interests paid on loans. By easy algebra Zezza obtains

$$\Pi = W - \Delta D^d + (\Delta E^s - \Delta E^d) - W - rL$$

and, therefore, when the supply of new equities from firms equals the demand from households, and assuming that the supply of bank deposits is perfectly elastic, he obtains also

$$\Pi = -\Delta D - rL.$$

According to Zezza, the best possible situation for firms is when the demand for new deposits from households is zero, and, therefore, firms get back the initial loan entirely either by selling consumption goods, or by selling equities. If this is the case, at the end of the production period firms will have enough liquidity to pay back the initial loan, but no liquidity to pay for interests, and there is no room for the realisation of profits.

Yet, Zezza (cfr. Zezza 2012) affirms at pp. 162-163, that we have to take into account the *ex post* flow accounting for a simple consistent model, shown here in Table 1.

	Firms	Households	Banks	Capitala account	Total
1. Firms		C		I	S
2. Households	W		Wb $(+r \cdot D)$		Yh
3. Banks	$r \cdot L$				Yb
4. Capital account	Π	ΔV	Πb		SAV
Total	S	Yh	Yb	I	

Table 1: Accounting Matrix for Zezza's simplest monetary circuit

Consequently, we have that the households' budget constraint is now given by

$$W + Wb = C + \Delta V$$

while banks' profits are given, in the third row and column, by

$$\Pi b = rL - Wb$$

and demand for equities arises from household savings and banks' profits

$$\Delta E^d = (\Delta V - \Delta D^d) + \Pi b$$

If we look at the budget constraint of banks, we shall see that our assumption implies that the end-of-period increase in the stock of loans will exactly match the end-of-period increase in the stock of banks deposits. The value of firms' profits then is given by

$$\Pi = C + I - W - rL$$

and using the previous equations it becomes

$$\Pi = I - \Delta V - \Pi b$$

while, using the equation that defines the demand for equities

$$\Pi = I - \Delta E^d - \Delta D^d$$

which is usually read as an *ex post* identity, stating that investment is financed by profits, new loans from banks or by issuing new equities. In Zezza's case, assuming instead that investment is financed by issuing new equities, and that the supply of equities matches demand, that is: I ($= \Delta E^s$) $= \Delta E^d$, we finally find

$$\Pi = -\Delta D$$

so that, if households' demand for new bank deposits is zero, $\Delta D^d = 0$, firms' receipts from sales are sufficient to pay back the initial loan *plus* interests. If, on the contrary, households increase their end-of-period stock of deposits, as we have already seen and many times repeated, firms will have a positive end-of-period debt with the banking sector.

However, even if he does not solve all the problems beyond any reasonable doubt, in our opinion Zezza shows the right way to follow.

In any case, there are still a few points on which it is good to dwell.

First of all, if we take Graziani's fundamental principle in a weak sense, the reflux of the bank money does not directly coincide with its (integral) destruction. The share capital is effectively destroyed, since the corresponding debt of enterprises is erased; the share interest, instead, returns to circulation as income of the banks (and those monetary units will be destroyed later, when they will flow back as share capital of a subsequent payment)[35].

Secondly, if some monetary units have to "flow twice" before being destroyed, this will have consequences on the velocity of circulation of money. Nevertheless, we believe that, at this level of abstraction, possible variations in the velocity of circulation of money are minimal. However, not such as to prejudice the hypothesis of a velocity, at least in the first instance, given[36]. In order to see substantial changes in the velocity of circulation it is necessary to go down in level of abstraction, agreeing to the accumulation of a *buffer stock*.

[35] As noted also by Zezza (see Zezza 2012, p. 159): "We thus need a 'financial period' which is longer than 'production period'".

[36] Zezza himself seems not to be too far from such a position when he writes (cfr. Zezza 2012, p. 160-161): "The logical closure of the circuit therefore requires that all income is spent, and this has implication on the velocity of circulation, but assumptions about velocity alone are insufficient to close the circuit".

6. Conclusions

In reconstructing Graziani's circuitist thought, we placed particular emphasis on previously inaccessible Italian texts. This revealed Graziani's value of sequential analysis, which he contrasts, similarly to Pasinetti, with the simultaneous analysis found in the GE.

We have tried to provide a personal interpretation of Graziani's circuit scheme, considering it a logical, rather than a historical, scheme that exists at the highest level of abstraction.

To do so, we have had to content ourselves with referring to the existing literature on circuit problems, although the diversification of levels of abstraction seems to us to open promising horizons in this regard. In our view, the continuation of this line of research could implement more utilization of Graziani's circuitist approach, particularly in the context of the ongoing debate on methodology in the economic sciences. This, in turn, could produce logical propositions drawn from monetary circuit theory that could serve as a reference point for empirical and economic policy analysis.

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