

# From Marketability to Flexibility: Pantaleoni's 'Impure' Theory of Money and Banking

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**Abstract:** Flexibility is the central feature of Maffeo Pantaleoni's analysis of both money and banking. His approach is based on the proposition that the most important function of money and banking is to loosen the real and temporal constraints on production and exchange activities, which are due to a relationship of complementarity between the factors of production. This proposition is crucial if one wishes to understand how Pantaleoni turned from the 'pure' equilibrium theory of the 1889 *Principii* to the 'impure' theory of his later essays, where no general or partial equilibrium may arise.

## 1 Introduction

This paper deals with Maffeo Pantaleoni's (1857–1924) analysis of money and banking and aims at demonstrating that the Italian economist developed one and the same theory for both institutions. The central feature of this theory was the notion of flexibility and its main claim was that the most important function of money and banks is the loosening of the real and temporal constraints imposed on production and exchange activities by the complementarity relationships among production factors. My general point is that such a theory provides the key to interpret the whole of Pantaleoni's economics because it establishes a strong connection between the two cornerstones of his thought, namely, what he called 'the law of defined proportions' and the dynamics of disequilibrium and structural instability. This connection is, in turn, crucial if one wishes to understand how he turned from the 'pure' equilibrium theory of the 1889 *Principii* – where perfectly rational, forward-looking agents lead the system to an efficient equilibrium – to the 'impure' theory of his later essays, in which the economy is populated by agents with limited foresight and bounded rationality, where no general or partial equilibrium may arise, let alone an efficient one. Thus, I claim that a correct assessment of Pantaleoni's place in the history of economic thought should give due importance to his later views which in many ways anticipated themes that were to be emphasised decades later by heterodox economists, particularly the Post Keynesians.

A secondary goal of the paper is to highlight the similarities between Pantaleoni's theory and the contributions on the same issues of the two economists who influenced him the most, Francesco Ferrara and Carl Menger. Pantaleoni's debt towards the two has already been acknowledged in the secondary literature; yet this should not lead historians to downplay the originality of Pantaleoni's contribution. What he did was to borrow from Ferrara and Menger the notion of marketability and transform it into the richer notion of flexibility, which could be applied to *both* money and credit. On the other hand, I do *not* claim either that Ferrara and Menger were the only inspirations for Pantaleoni on money and banking or that he was the first – or the only – scholar to focus on the flexibility function of finance.<sup>1</sup> My limited aim here is

to show the extent to which Pantaleoni's approach represented an improvement on what had been advanced by these two famous predecessors.

The milestones of Pantaleoni's intellectual trajectory in the field of money and banking<sup>2</sup> are, firstly, the classification of goods and the analysis of money and capital presented in his 1889 classic, the *Principii di Economia Pura* (translated into English as *Pure Economics* (1898 [1957]) – the book that marks the official entry of Italian economics into the so-called marginalist revolution – and, secondly, the theory of banking and fixed assets developed in the 1895 essay *La caduta della Società Generale di Credito Mobiliare Italiano* (Pantaleoni 1895 [1977]). He then refined and clarified his views in a few other essays written in the early twentieth century (Pantaleoni 1915 [1936a]; 1924 [1936b]). The content of this paper mirrors that trajectory. In section 3 I summarise the classification of goods and the theory of capital of the *Principii*. In section 4 I examine the 'pure' theory of money contained in the same book. The fifth section covers the 'impure' theory of banking, as presented in *La caduta*. In section 6 I deal with the highlight of that essay, namely, Pantaleoni's general theory of fixed assets. The notion of flexibility and its applicability to money and banks is the topic of section 7. A final section concludes the paper. Before commencing section 3, however, I will briefly review Ferrara's and Menger's contributions on money and credit.

## 2 Ferrara and Menger on Money and Credit

This section briefly surveys the contributions of two leading economists, the Italian Francesco Ferrara (1810–1900) and the founder of the Austrian School, Carl Menger (1840–1921), on the themes of money and credit. The goal is to stress their similarity to, and possible influence upon, Pantaleoni, so much so that they may represent a proper benchmark to assess the originality of the latter's contribution. With such a goal in mind, my presentation will be very schematic and will completely neglect some of the central issues in Ferrara's and Menger's monetary and banking thought.

The main reference for Ferrara's theory of money and credit is the 1856 introduction to the volumes V–VI of the *Biblioteca dell'Economista*, entitled 'Della moneta e dei suoi surrogati' (or, the English, 'On money and its substitutes' 1856 [1961]).<sup>3</sup>

According to Ferrara, the essence of money was to be found in its double role as a *universal equivalent* and a *real pledge*. Concerning the first, Ferrara's views were quite conventional: money is accepted as a means of exchange, that is, it is demanded not to be consumed but to be exchanged with other goods thanks to 'its ability to be transformed into whatever we need' (*ibid.*, p. 111).<sup>4</sup> As to the second role, he claimed that money acts as a real pledge during the interval separating the two phases of exchange, the sale of some goods and the purchase of other goods. Thus, Ferrara endorsed theoretical metallism:<sup>5</sup> there can be no fiat or paper money because no agent would ever accept in exchange of his goods something devoid of intrinsic value, that is, of the only guarantee (namely, the pledge) that in case she cannot employ her money to purchase other goods she will nonetheless be able to draw some utility from it.

The realist approach to the nature of money is confirmed by Ferrara's explanation of the *logical* origin of its functions as an equivalent and a pledge. From an individual's viewpoint, a thing is accepted as money because everybody accepts it in exchange for goods. The general acceptability or transferability of

money is 'a highly important [fact], which could be called *constitutive* of money' (*ibid.*, emphasis added). If paper, or even mud, were universally accepted as much as gold and silver are, paper and mud could well act as a means of exchange and become money. That this does *not* happen proves that universal acceptability does *not* suffice to account for the logical nature of money. The transferability property must be based on an objective feature recognisable by everybody: this requirement of objectivity explains why gold and silver are used as money while paper and mud are not. Such an objective feature is, of course, the precious metals' own utility. Hence, Ferrara concluded that the tacit confidence in the universal acceptability and general transferability of gold and silver depends on the intrinsic qualities of the two metals, that is, on their ability to act as a real pledge (*ibid.*, p. 112).<sup>6</sup>

What is really surprising is that, despite his rigid theoretical metallism, Ferrara developed a rather innovative theory of credit. He started from the observation that 'credit stems from exchange' (*ibid.*, p. 213), because it is only with exchange that the need arises for finding a proper means for the general transmission in time and space of economic values, rather than physical goods. Money is the first and simplest instrument for doing that, but may offer only a partial solution precisely because of its physical nature. The inadequacy of money is demonstrated by the circumstance that, in order to promote trade, economic progress has been accompanied by a historical process of de-materialisation of the transmission of values, which has progressively eliminated money from transactions. Such a process may be given a theoretical interpretation, which also highlights the logical essence of credit. Indeed, the de-materialisation of transactions has led to the creation of credit, broadly defined as 'the set of means aimed at spiritualizing ... value, at making it as independent as possible of the factual circumstances which hinder its transmission' (*ibid.*). Regardless of their specific nature, these 'factual circumstances' all end up being a matter of time: whenever the word 'credit' is used, it is always a matter of two values, present and future, and of a 'device whatever, capable of establishing a link between them, of giving them the simultaneity they lack' (*ibid.*, p. 214).

Ferrara focused on the two polar cases of a credit backed by a fund whose physical existence and economic value are well determined – say, a plot of land – and of a credit backed by a still non-existent value – say, that of a future harvest (*ibid.*, pp. 214-5). In the first case, the landlord may easily spend the value of his land in exchange.<sup>7</sup> While the landlord may sometimes find it either impossible (for lack of a buyer) or non-profitable (because of a low market price) to spend such a value, he can always borrow its money equivalent, so much so that the borrowed amount fully replaces the land's value. In the second case, the farmer only owns a 'mental value', that is, an expectation, which can hardly be spent in exchange. Thus, until the harvest takes place, such a value is 'embodied in the [farmer's] trust, in his work, in his personal abilities, or, better, in his mind'. What credit actually does is to transform into money 'a value that is hampered by a matter of time': the lender allows the farmer to wait until the harvest, that is, 'takes the burden of time off the farmer's present value and places it upon himself' (*ibid.*). This, according to Ferrara, was the logical essence of credit. Indeed:

[r]egardless of its manifestation, [credit] is nothing but *the exchange of a more transmissible value for a less transmissible one*; and since the higher or lower transmissibility of a value may always be turned into a matter of time, credit is nothing

but the exchange of an actual value for a *promise* of a future value. (*ibid.*, emphasis added)

Time, transmissibility and 'promise' (namely, uncertainty): these very same notions will become, a few decades later, the catchwords of Pantaleoni's flexibility theory of money and banking.

Menger's two main works on the nature and origin of money are two chapters (Chapters VII–VIII) of the 1871 *Grundsätze* and the classic 1892 paper in the *Economic Journal*.<sup>8</sup>

Menger's problem was to explain, in terms of the rational choice of selfish agents, the 'mystery' of money, that is, the circumstance that some goods have become universally accepted as means of exchange. Indeed, the agents' behaviour in a monetary economy looks irrational, as they exchange their useful goods with another one, money, which gives them no direct utility. What Menger did was to demonstrate that this behaviour may well be explained in terms of individual rationality. His argument centered on the notion of *marketability*, or *saleableness*:<sup>9</sup> goods have a variable degree of marketability (Menger 1871 [1994], pp. 258–60); money has the highest degree of marketability (*ibid.*, p. 242); hence a theory of marketability is the logical prerequisite for any theory of money.

A good's marketability is defined as the ease of selling it, at any time and any place, at an *economic price* – the latter being a price corresponding to the 'present general economic conditions'.<sup>10</sup> Menger claimed that past economists had failed to recognise that the buyer of a certain good who has paid a given price for it can never re-sell the good *immediately* and at the *same* price. Bid and sale prices are always different even in the best organised market; hence, while one can always buy a good, at any time and at a definite price, one can never sell the same good at any time, at least not without suffering a loss of variable size. The different goods may therefore be classified in terms of their marketability by looking at the ease with which they can be sold, at any time, at a price at least approximately equal to their purchasing price (Menger 1892, p. 244).

Such a classification may be further refined if we also take into account *safety*, that is, the probability that a given good may be sold at the desired conditions. It turns out that only very few goods enjoy what Menger called the *ease and certainty* of marketability at an economic price (*ibid.*, pp. 246–7). Those who possess these goods have a higher probability of finding somebody in the marketplace willing to sell the goods to them that they desire (Menger 1871 [1994], pp. 259–60). It follows that it is perfectly rational for an individual to exchange goods with a low marketability for goods with a higher marketability, even if the latter are not directly desired, because there is a gain, in terms of easiness, certainty and price, in bringing to the marketplace goods 'which correspond to a want ... which is at once universal and ... always imperfectly satisfied' (*ibid.*).<sup>11</sup>

With the extension in time and space of market exchanges, the notion of marketability also broadened its meaning. The most saleable goods became those enjoying features such as durability, transportability, etc., which could guarantee the owner 'a power, not only "here" and "now", but as nearly as possible unlimited in space and time generally, over all other market-goods at economic prices' (Menger 1892, p. 248). In the end, the most saleable goods were accepted by everybody as means of exchange, that is, they became money.

In the 1892 paper Menger stressed, much more than in the *Grundsätze*, the dynamic character of his theory. He even conjectured that the existence of money might trigger an endogenous process of change in the economic system (*ibid.*,

p. 252): when the relatively more saleable goods become money, their marketability is further increased due to a qualitative transformation, since those who own the goods-turned-money now have the *certainty*, rather than a mere probability (high as it was), to be able to purchase any other good. In particular, the money-holder enjoys both an almost unlimited possibility to wait until a favourable purchasing opportunity arises and an equally unlimited possibility to modify her endowment of goods depending on the market circumstances.<sup>12</sup> Hence, money ensures a *full control* over the consumption process: the money-holder's plans can always be fulfilled, that is to say, with certainty, everywhere and at an economic price. In short, the money-holder exhibits a considerable *market power*. On the contrary, those who bring to the marketplace goods that are not money are in a situation of 'economic disability' (*ibid.*, p. 250), because to get what they want they have to depend on circumstances external to their own will. They have no market power and so they can never be certain of getting the desired goods immediately, everywhere and at an economic price. Their control over the consumption process is weak with respect to space, time and price.

Menger's implicit conclusion was that money is a mechanism which endogenously allocates market power, thereby constantly modifying the economy's exchange structure. As I show below, this will also be Pantaleoni's conclusion, though the Italian economist will extend it to the banking system as well.

### 3 Some Remarks on Pantaleoni's Classification of Goods and Theory of Capital

Influenced as they might have been by Ferrara and Menger, Pantaleoni's own views on money and credit also descended from his classification of goods and analysis of capital in the *Principii di Economia Pura*, which was published 1889.

In the fourth chapter of his book Pantaleoni distinguishes among three categories of goods (Pantaleoni 1898 [1957], pp. 81-4). The *direct utility goods* are those directly satisfying an agent's needs; hence, they are the only goods which are really desired by individuals. The *complementary goods* are those which may satisfy a need only if used together with one or more other commodities. The *instrumental goods* are those giving no direct satisfaction as they are only instrumental in obtaining either the direct utility or the complementary goods; among them feature the primary goods and the productive services, including labour. Any commodity may belong to any of the three categories, depending on the needs it is to satisfy. In particular, and remarkably for his theory of money, Pantaleoni claims that any direct utility good may become an instrumental one if it is used for exchange (*ibid.*, p. 84).

Pantaleoni observes that the complementary goods give no utility to the agent unless they are used according to the *law of definite proportions* (LDP). The law claims that, generally speaking, every economic process, be it production or consumption, takes place according to well-defined proportions among the goods and services involved in it. Such a general law, which is a manifest violation of the neoclassical principle of general substitutability in production and consumption, is absolutely crucial in Pantaleoni's economics. Indeed, the law entails that, first, every quality of the 'things' forming the subject of economic analysis exists in a well-defined measure, and, second, any proportion between 'things' is actually a relationship between qualities, that is, between measures. Given that any such

proportion may be represented in mathematical terms, and given that the LDP requires that in every economic process some of these proportions must be strictly respected, the LDP is, to Pantaleoni's view, no less than the cornerstone of any *mathematical* (read: scientific) treatment of economic phenomena (*ibid.*, p. 85, fn.1).

How can the LDP be reconciled with Pantaleoni's adherence to the marginalist school? The answer lies, as I detail below, in his depiction of economic agents as imperfect with bounded-rationality. If we recognise this, it turns out that the LDP is neither an objective nor an absolute law, but rather the outcome of the agents' inevitable ignorance of at least some (but usually most) of the infinite ways to combine production factors or enjoy consumption goods. Hence, at any moment of time, the LDP is nothing but a set of constraints determined by the present state of the agents' information, so much so that the law has a clear *subjective* and intrinsically *relative* foundation.

Capital goods are defined in the *Principii* as 'the direct [utility] commodities which supply the immediate wants of men whilst they are engaged in the preparation of other commodities' (*ibid.*, pp. 243-4). The rationale is, of course, that the application of labour to the production of any instrumental or direct utility good presupposes an initial endowment of commodities addressed to satisfy the workers' present needs (*ibid.*, p. 244). Thus, capital is to Pantaleoni just a goal-oriented anticipation of direct utility goods, a set of 'commodities with a goal'.

The availability of capital is a necessary condition for individuals to deviate resources away from the production of direct utility goods and towards the production of those instrumental commodities, which will later allow an easier, or cheaper, production of direct utility goods. The amount of capital required for this task depends on both the length of the instrumental goods' production process and the workers' consumption level: this is synthesised by the claim that capital enables workers 'to tide over the interval between the beginning and end of the production of an instrumental commodity' (*ibid.*, p. 251, original emphasis).

Pantaleoni stresses that only a fund of direct utility goods may be called 'capital', while instrumental goods can never be, as they always need to be first turned into direct utility ones (*ibid.*, pp. 245-6, fn.1). However, he adds that agents usually prefer to store capital as instrumental goods on account of their greater durability. In particular, the *most durable* instrumental goods, and thus the best way to accumulate and store capital, are *money* and *credit*: this for the very Mengerian reason that they also are the instrumental goods which can *more easily* be turned into (read: exchanged with) direct utility ones – the unit of measure of 'ease' being the circumstance that 'the sale of [these instrumental goods] can always be counted on at not unfavorable ratios of exchange' (*ibid.*, p. 245, fn.1).<sup>13</sup> Hence, Menger's notion of 'ease' is essential for Pantaleoni's idea that, while they are not themselves capital, money and credit provide a very peculiar service to the economy, namely, that of being the instrumental goods which can most easily and economically be converted into direct utility ones.

A final remark: Pantaleoni finds the rationale for the interest on capital in the difference of knowledge between the lender and the borrower. It is only the latter who *knows how* to employ a given capital in order to reproduce and increase it; hence, interest is explained by the borrower's knowledge of the productivity of capital in a time-consuming production process, rather than by the passing of time itself (*ibid.*, p. 254). A first corollary of this conclusion is that interest has no relation with the value of money or the discount rate: capital and money markets

are completely separate in Pantaleoni's view.<sup>14</sup> A second corollary is that capital demand depends on the borrower's expectation of profitable investment opportunities. Pantaleoni assumes in the *Principii* that these expectations are always correct, at least in the long run. This is hardly surprising, since 'pure' economics is the realm of perfect rationality and perfect foresight.

Pantaleoni's views on rationality and expectations will broaden in later works, paving the way for a richer understanding of the role of money and credit in modern economic systems. It follows that these works, which seemingly deal with very down-to-earth topics (such as Italian financial scandals or banking laws) and which for this reason have been frequently downplayed, deserve to be ranked among his best *theoretical* contributions.<sup>15</sup> Indeed, these works deal with the behaviour of agents who are neither perfectly rational nor perfectly foreseeing and the working of markets that fail to reach an efficient equilibrium. Most of Pantaleoni's original reflections on money and banking belong precisely to this world of 'impure' theory.

#### 4 A 'Pure' Economics Perspective on the Nature and Functions of Money

This section deals with Pantaleoni's analysis of the nature and functions of money in the *Principii*, that is, when he was still engaged in drawing the implications of a 'pure' theory of economic behavior.<sup>16</sup>

'Money is an instrumental commodity in a paramount degree, and is exclusively instrumental' (*ibid.*, p. 221, original emphasis). This is how Pantaleoni opens the chapter in the *Principii* dedicated to monetary theory. He then moves on to give the definition of money as '[a]nything that serves as a medium of interchange' (*ibid.*, original emphasis). Thus, money is the 'purest' instrumental good for two reasons: first, because it only has an instrumental role in the economy, and, second, because it may act as an instrumental good without the joint occurrence of any other complementary commodity. Yet Pantaleoni refers to money as a 'thing', not a 'good'. This is because money may well be a 'thing' with no direct utility, so much so that the more the 'thing' used as money is devoid of direct utility, 'the more it is markedly money. The players' tokens are, among the players, a very perfect money' (*ibid.*). Hence money's only utility is indirect: it is an instrumental good which only by way of exchange can guarantee the achievement of any direct utility.<sup>17</sup>

Pantaleoni then gives a fairly standard account of the rationale for money in terms of the urge to overcome the problem of the double coincidence of wants in a barter economy – the division of labour being of course the necessary condition for exchange to arise in the first place. However, there is another pre-condition for money, 'a condition of fact', that is, one which may hold or not according to the different circumstances (while the division of labour is a pre-condition which is historically verified once and for all). The condition is that 'all desire and accept money, being confident that they can dispose of it whenever they want to' (*ibid.*, p. 223). Money is precisely that thing which 'every one is ready to accept always, everywhere and to any amount' (*ibid.*, p. 222). Thus, Pantaleoni also believes that the truly fundamental feature of money is its universal *acceptability*, while the factual condition which makes its existence possible is the agents' *confidence* in this acceptability. Such a confidence stems from the marketability of money: it must be possible for money 'to be resold by the purchaser; that is, it must have a

power of exchange *whatever the specific cause of that property may be* (*ibid.*, pp. 224-5, original emphasis).

Yet Pantaleoni makes a step forward with respect to Ferrara and Menger in that the reference to confidence opens monetary analysis to the themes of expectations and forward-looking behaviour. Confidence may in fact be due to 'all those [causes] which, in a general way, enable us to foresee and to count upon the actions of others' (*ibid.*, p. 223). Hence, confidence depends on the existence of the proper set of interactive expectations, so much so that the acceptability of money itself becomes a relative feature which may vary according to the fulfilment of those expectations.

Pantaleoni underlines that confidence does not necessarily depend on the intrinsic, objective features of the 'thing' acting as the means of exchange. On the contrary, the real motives underlying this confidence, that is, the reasons for money's 'exchange potential', are totally 'immaterial: one thing will serve the purpose of money *equally as well as any other*, provided that an equal degree of confidence be placed in it' (*ibid.*, emphasis added). This explains why he avoids investigating how confidence may arise (or be lost) in the first place: he takes it for granted, as if an equilibrium of interactive expectations had already been achieved, and constantly preserved, in the economic system.

There is little doubt that Pantaleoni's views are quite distant from theoretical metallism, although, as I show below, his position can hardly be encapsulated in a rigid metallist vs. cartalist dichotomy. By emphasising the role of confidence, Pantaleoni completes the separation of the essential function of money from the physical nature of the means of exchange, thereby eliminating the last materialist vestiges that could still be found in, say, Ferrara's idea of money as a real pledge.<sup>18</sup>

The physical nature of money only comes back into play when Pantaleoni proceeds to list the *causes* of confidence. The top place belongs to the circumstance that the 'thing' acting as money also be capable of satisfying a direct and universal need, that is, itself be a direct utility good. In such a case, the acceptance of money directly stems from an agent's awareness of other agents' hedonistic interest in the 'thing' (*ibid.*).

Second among the causes of confidence comes the habit of accepting a given thing as money. In such a case the expectation of universal acceptance is based on a sort of 'automatic behavior', that is, on the circumstance that everyone will accept money in exchange for goods for the simple reason that she has always done so before. Indeed, Pantaleoni believes that only 'a tiny, but very smart, minority' of people – the financial market speculators – can escape the power of habit and refuse to accept money when, say, they foresee a confidence crisis.

Finally, the Italian economist lists as minor causes both the establishment of a convention, like that between the players in a card game, and the imposition of money by a legal rule. With respect to the latter, the clearest statement is in the 1906-07 *Lezioni*, where he claims that 'paper comes to be called inconvertible paper money, and it is a true money, because such is any good, made of either paper or metal, that in the exchange enjoys the universal power to set anyone free [of his debts] in the territory where a country's rule of law holds' (Pantaleoni 1906-07, p. 406).

These causes are not mutually exclusive, so they combine in establishing the acceptability of the means of exchange. What really matters, however, is that only in a footnote (Pantaleoni 1957, p. 223, fn.6) Pantaleoni hints at the position of those economists, like Michel Chevalier and Karl Knies, who claim that money



must *necessarily* be either an instrumental or direct utility good, that is, must have a utility of its own. Thus, theoretical metallism is a mere aside in the *Principii* and it is apparent that Pantaleoni does not endorse it. Indeed, going back to the example of the two players, he follows Francis A. Walker in arguing that: 'Money may consist of mere counters, such as those used by players, or of pieces of paper destitute of any direct, or of any other instrumental, utility' (*ibid.*, p. 225). In the realm of 'pure' theory it would even be possible to replace money with an accounting system – where, once more, 'the realm of pure theory' is that inhabited by perfectly honest and enlightened agents, none of whom either make pledges that she is not certain to honour or believe in unfounded promises. In such a setup there is no reason to reject the possibility of a pure 'symbolic-money' efficiency, as what really matters is just the confidence in its acceptability.

It is only when we enter the realm of 'impure' theory, where agents are just imperfectly rational and where uncertainty cannot be fully handled through the knowledge of probability distributions, that money can no longer be a mere credit certificate, but has to have a physical nature that brings some direct utility to those who accept it. Yet, even in this realm, Pantaleoni is still wearing the theoretician's, rather than the pragmatist's, hat; hence, it would be misleading to label him as a theoretical cartalist and practical metallist. His most important lesson is precisely that there can be no unique theory of money, but *several*, depending on the level of abstraction of the analysis.

The level he will deliberately choose in the works following the *Principii* will be that of 'impure' theory. This will lead him to formulate statements which have been used to classify him as a *practical* metallist, as if having abandoned the rarified world of 'pure' economics would automatically empty his claims of any theoretical relevance and relegate them to the field of contingent policy advice. More generally, such a choice has led many interpreters to suggest the thesis of the *two* Pantaleoni: the rigorous theoretician of the *Principii* and the confused pragmatist of the later essays. My claim is that, on the contrary, there has been only *one* Pantaleoni, since what he did in his later monetary works was rigorously draw the theoretical consequences of the abandonment of 'pure' theory.

A good example is offered by his views on the other traditional functions of money (unit of account, store of value). In the *Principii* he considers these functions merely to be contingent, but never necessary, for a 'thing' to act as money, although he adds that the possibility of, say, using money to transfer value in space and time is an obvious advantage from the viewpoint of its acceptability as a means of exchange (*ibid.*, pp. 225-6). As I show in the next sections, Pantaleoni will change this position in later works: in the realm of 'impure' theory, money performs other essential functions beyond the primary one of means of exchange, the most prominent of them being that of acting as a tool for flexibility.

## 5 Pantaleoni's 'Impure' Theory of Banking<sup>19</sup>

No room is left in the 1889 *Principii* for banks. Indeed, in terms of 'pure' theory, what a banking system may do is – as Ferrara had noticed – just to reduce the waste caused by the excessive use of metal money (Pantaleoni 1957, p. 238, fn.1). All credit instruments are mere substitutes for money, that is, means of exchange which perform the same task of money and need be backed by a 'real' means of exchange (*ibid.*, pp. 239-40). More generally, both the demand and the supply side of the capital market are in 'pure' theory populated by perfectly rational and perfectly

foreseeing agents, so much so that an intermediary like the bank, whose goal it is to ensure the matching of demand and supply, is strictly-speaking unnecessary.

It is only when we turn to 'impure' theory that banks begin to play an essential role in the working of capital markets. Yet what is really remarkable is that such a role does *not* depend on the attribution to banks of any task or power other than that of acting as pure intermediaries between the demand for and supply of funds. In other words, in Pantaleoni's 'impure' theory there is no need to assume that banks *create* credit to conclude that they may still have major real effects on the economic system. This explains why he can refer on several occasions to the banking system as one of the engines of the business cycles while remaining faithful to the classic, purely intermediary view of banks. As I show below, a similar intermediary role, with similar real effects, is performed by money; hence, it may be argued that both banks and money emerge in Pantaleoni's analysis as institutions capable of warranting the smooth functioning and steady development of the economic system.

Pantaleoni's main work in banking theory is the 1895 essay *La caduta della Società Generale di Credito Mobiliare Italiano*.<sup>20</sup> The essay deals with the events leading to the breakdown of one of the major financial institutions of the newly born Kingdom of Italy. Pantaleoni was appointed to apply his professional expertise to the case and in the aftermath decided to make public his opinions on the real causes of a crisis which had threatened the stability of the whole financial system. While the essay has been praised as an early masterpiece in the Italian accounting literature, my goal here is to demonstrate that it should also be read as a major work in economic *theory*. In less than 200 pages Pantaleoni lays the foundations of a theory of 'personal' banking,<sup>21</sup> nested into a more general theory of banking, which, in turn, is nested into an even more general theory of institutions and super-organic structures. To tie this all together, his *general theory of fixed assets* becomes the analytical picklock to open the coffer of Pantaleoni's 'impure' theory.

To start with, note that Pantaleoni still views the bank as a pure intermediary. He repeats this time and again in the essay, for example, when he argues that 'it is obvious that a bank may not grant any more credit than what it receives' (Pantaleoni 1895 [1977], p. 55). Another leitmotif of his banking theory is the emphasis on the specialisation of banking functions. He claims that even banking crises are almost always caused by a violation of the specialisation rules: a crisis obtains whenever the fundamental *financial equilibrium condition* (FEC) – namely, the matching, in terms of quality and duration, between a firm's assets and liabilities – is infringed. In the case of a bank the FEC is even more binding than for other firms, either because the kind of assets a bank may possess is strictly determined by the kind of available capital or, when the nature of the bank's assets is predetermined, because this implicitly establishes also the kind of capital the bank has to raise (*ibid.*, p. 57).

The two limiting cases of the FEC are that of a bank operating only with its own capital and that of a bank whose liabilities are made up only of deposits. In 'purely' theoretical terms, in the first case it is as if the bank enjoys a perpetual credit which grants it the freedom to perform any kind of operation, while in the second case the FEC forces the bank to invest its capital only in highly liquid assets (*ibid.*, pp. 55-6). Note that in the latter case the bank is entirely devoid of its own capital and acts as a pure intermediary. Indeed, Pantaleoni views deposits as nothing but a liquid capital which savers make available to the bank; hence, they

are capital, not money. This explains why, in 'pure' theory, a bank may even work without any starting capital: 'it is obvious that the guarantee for the deposit is not in the bank's initial capital, but in the kind of investment into which it has been transformed. Theoretically speaking, the bank may have zero capital' (Pantaleoni 1936b, p. 507).

In *La caduta* Pantaleoni also provides a detailed investigation of the actual working of banks.<sup>22</sup> A bank is an intermediary between savers in search of long-term investments and entrepreneurs demanding funds to be invested in fixed assets. Its specific role in the economic system is either to directly finance the formation of new firms' fixed capital, or to purchase those assets representing the fixed capital of existing firms (that is, stocks or bonds) in exchange for liquid capital (that is, money). Thus, both its typical operations entail long-term, highly risky investments. In other words, the core of a bank's activity lies in exchanging liquidity (that is, a 'free' capital) for the firms' stocks and bonds (that is, assets representing a fixed capital). By doing that, the bank accepts to bear the burden of 'fixing' its capital, while at the same time taking such a burden off the firms' shoulders. As Pantaleoni puts it, the bank opens, at its own risk and expense, 'a communication channel between the basins of already-fixed capital and the basins of still-free capital' (Pantaleoni 1977, p. 58).

The crucial role played by banks may best be appreciated by looking in particular at the second kind of operation, namely, the purchasing of the firms' stocks and bonds. This activity highlights the nature of banks as institutions capable of molding the qualitative and temporal structure of the firms' assets and liabilities. Remarkably, Pantaleoni emphasises that, in doing so, banks play a role that is quite similar to that of money: like money, a bank is nothing but a tool '...to do quickly and more comfortably what could be done even without it' (Pantaleoni 1977, p. 230); like money, it represents a bridge in time and space between different investment decisions.<sup>23</sup>

The same function may be assessed by looking at the bank's liabilities. According to Pantaleoni, banks operate a qualitative transformation of the capital they raise in the market by turning it into a single portfolio of assets, called *omnium*. Acting as an intermediary between savers and firms, a bank uses the former's money to purchase a basket of assets made of the latter's shares and bonds, and offers in exchange its own shares and bonds, whose return depends on that of the basket itself. Hence, those who buy a bank's share or bond are actually underwriting a share of the underlying *omnium*.

If banks did not exist, savers themselves would have to underwrite the firms' shares and bonds, but in such a case the matching of the demand and supply of funds would have to take place on the basis of an individual search which would suffer from the same drawbacks of barter (*ibid.*, p. 61, fn.). Once more, the market has found a solution in the spontaneous evolution of an intermediary, though this time not taking the form of a highly marketable means of exchange, but of an institution capable of coordinating the lenders' and borrowers' decisions (*ibid.*). Hence, like Mengerian money, the Pantaleonian bank is, again, nothing but a 'tool' to overcome the problem of barter, that is, to make capital liquid at an economic price.

Finally, banks play another fundamental role in the economic system, namely, that of promoting its smooth development by preventing two kinds of crises: the (qualitative) one caused by the mismatching between the supply and demand of specific investment goods and the (quantitative) one caused by the

general excess supply of fixed goods. This, note well, is the case despite banks' inability to create new resources in a world where the quantity of goods and services is *given* at any time and place as an outcome of the autonomous production and consumption choices of individuals and firms. Like Ferrara before him, Pantaleoni believes the role of credit is to transform these resources in a qualitative-temporal sense: credit distributes the mass of existing goods and services from those who have produced them to those who intend to employ them in the most efficient way (*ibid.*, p. 160). Thus, though it does not directly *create* new wealth, credit *transforms* the available real resources by directing them towards the uses which most profitably fit the entrepreneurs' needs; this, in turn, facilitates the creation of new wealth. Ensuring the most efficient re-distribution of existing real goods and services is therefore one of the basic functions and main benefits of the credit system (*ibid.*).<sup>24</sup>

The most interesting feature of Pantaleoni's banking theory is the way he linked banking activity to the law of defined proportions (LDP), this time combined with the financial equilibrium condition (FEC). The LDP rigidly constrains the asset structure of a firm: if the firm is efficient, that is, employs its resources in the 'right' proportion, none of its assets may be sold without affecting the working of the whole business. Moreover, we know that in order to obey the FEC, a firm's fixed assets have to be backed by a set of liabilities with comparable characteristics in terms of certainty, stability and duration. While the joint action of the LDP and the FEC causes no problem in a static setup, troubles arise as soon as a firm plans to make a new investment, either because it wants to exploit a new market opportunity or because it is forced to modify its production structure by an unexpected change in market conditions. How should the firm finance the investment? How could it reconcile the need to purchase the new assets using liquid means (the only means the asset's seller would normally accept) with the above-mentioned criterion of always backing its long-term investments with long-term liabilities? More generally, how could a firm's liability side be made to cope with the assets' structural rigidity imposed by the LDP? These questions, which only arise in a dynamic setup, cast doubts on the possibility of reconciling the LDP with the FEC. Yet, it is precisely here that Pantaleoni finds the rationale for banking activity.

A new way to look at a bank's typical operations, as described earlier, is in fact to argue that what a bank actually does is to loosen the constraints imposed by the LDP, without affecting the efficiency of the firm's asset structure, and set the latter's liability structure free of the rigid rules of the FEC, without undermining its financial stability. In other words, the intervention of the bank allows the structural transformation of the firm, that is, the achievement of a new and (in LDP terms) efficient asset structure, without requiring the firm ever to deviate from the virtuous path of economic efficiency and financial solidity.

Anticipating, one of the main themes of his classic 1909 paper on disequilibrium dynamics,<sup>25</sup> and in explicit connection with the LDP, Pantaleoni notes that the service offered by the bank may also be read as a change in the combination of fixed and variable capital (*ibid.*, p. 8, fn. 8). According to the LDP, there is only one efficient (read: most profitable) combination between fixed and variable capital for any firm. Yet this combination is not invariant to technological progress, as well as to changes in consumers' tastes and market conditions. The problem for a running firm whose capital is crystallised in a given, and until then

efficient, combination is how to react to such changes and make the transition towards a new first best. This, I repeat, is where the bank comes into play.

Thus, while Pantaleoni views banks as a mere intermediaries, unable to create credit or any other real resource, at the same time he considers them as the key institutions for promoting economic development, so much so that he attributes relevant real effects to their activity. By making the fixed capital liquid and by creating new 'communication channels' (that is, new markets) between the various forms of capital, the bank breaks the chains of the LDP, granting firms the possibility of seizing new market and technological opportunities.<sup>26</sup> Note that Pantaleoni does not deny that these opportunities might be exploited even without the bank's intervention, but simply argues that in such a case the transition towards the new equilibrium situation would take place along a dynamic path which would be either inefficient (because of the violation of the LDP), or unstable (because of the violation of the FEC), or both.

The similarity between banks and money is manifest. In Pantaleoni's view, the goal of both institutions is to loosen the real constraints (initial endowments, lack of information, LDP, assets/liabilities structure) impeding the smooth working and steady evolution of the economic system. Hence, both institutions perform the crucial task of ensuring the 'flexibility' of economic agents. By being flexible, an agent is protected against the unexpected changes in the economic environment and, at the same time, is capable of intentionally transforming the environment itself. While the flexibility granted by money and banks is useless in a 'pure'-theory setup of perfectly rational and perfectly foreseeing agents, who can neither be surprised by environmental changes nor be willing to be themselves the promoters of change, it is essential in the world of 'impure' theory, where agents can make mistakes and/or be unable to foresee future events. Thus, flexibility is both a shield against the unexpected and a weapon to destroy static equilibrium conditions, which allows real-world, 'imperfect' agents to operate in the market without being hampered by the constraints of the LDP and the FEC.

## 6 The General Theory of Fixed Assets<sup>27</sup>

Theoretically speaking, the most original pages of *La caduta* are those dedicated to the general theory of fixed assets (Pantaleoni 1977, pp. 147-74). Here, at the height of his 'impure' theory, Pantaleoni combines several aspects of his thought to produce an analysis that transcends the limited domain of money and banks. Behind the theory of fixed assets lies, in fact, his general view of economic dynamics as a permanent struggle between the fixed and the flexible elements of the economic system.

According to Pantaleoni (*ibid.*, p. 147), two dangers loom over banks and may cause their crisis: the danger of *losing* their capital and the danger of *fixing* it (that is, of making it illiquid). The two threats correspond to very different situations, comparable to the difference existing – as he puts it – between a dead man and a sick one: a loss is an irremediable destruction of wealth, while a fixed asset is just an investment with a very long, yet supposedly positive, return (*ibid.*, p. 148). Thus, losses and fixed assets are antithetic: the former tell 'the story of the retreats of the mankind; ... the story of the obstacles encountered along the troublesome path of enrichment and civilization'; the latter, instead, represent 'the history of progress ... the milestones of the civilization process' (*ibid.*, p. 149).

Losses belong to the past, so nothing can make them up; the problem of managing financial crisis and rescuing failed banks – the main theme of *La caduta* – comes to the fore only with respect to fixed assets. This entails that, in order to deal with the former, a preliminary formal analysis of the latter is required.

The starting point is the *banking definition* of a fixed asset: any investment which cannot immediately be transformed back into money without incurring huge losses. In other words, a bank considers fixed any asset which is not immediately liquid; hence, ‘fixed asset’ is synonymous with ‘unavailable money’, or, more generally, with any relatively less saleable good (*ibid.*, p. 150). All commodities can therefore be classified according to their degree of ‘fixity’ or *liquidity*, where the latter is defined as the quality of a good or asset to be always in demand with no price reduction – the most liquid asset being of course money (*ibid.*, p. 155). The link with the Mengerian notion of money as ‘that commodity which can always be sold at an economic price’ (see above, section 1) is manifest; indeed, Pantaleoni quotes Menger’s analysis in the *Grundsätze* to argue that money ‘is the good with the largest market ... The rigorous study of the characters determining the size of the market has been masterfully done by Menger and I may take it for granted’ (*ibid.*, pp. 155-6). Thus, Menger’s concept of marketability becomes, in Pantaleoni’s analysis, that of liquidity, that is, of market size.

Starting with money, we can list all the goods according to the size of their respective markets. This, however, requires that we go beyond the pure banking definition of fixed assets to embrace a more general one:

a fixed capital is such that *it cannot be used in any other way*, by removing it from its current use, *without deteriorating either the removed part or the part which stays invested* without the removed part; a liquid capital is such that it can be invested in any way, with no deterioration. (*ibid.*, p. 157, original emphasis)

Two corollaries of this definition highlight the links between the classification of the goods in the *Principii* and the theory of fixed assets in *La caduta*. First, the capital of an efficient firm is highly fixed, because, in the absence of technological progress, no firm satisfying the LDP can have any amount of capital freely available for different uses. Second, money is really the less fixed, namely, the most liquid, asset: it is, in fact, a kind of capital which needs no other goods to perform its instrumental function – the instrumental good *par excellence*. Thus, money is neither subjected to the LPD, nor diminishes its utility as an instrumental good when shifting from one use to another.

An alternative way to define the degree of ‘fixity’ of an asset is in terms of the *flexibility*, or rigidity, of a certain economic position. To do that, we need to abandon the world of statics and enter the realm of intertemporal choices under uncertainty. This is exactly what Pantaleoni does when, in a passage which deserves to be quoted in full, he claims that:

When a piece of wealth which was capable of several uses is made amenable to only a very limited, and, what matters most, *irreversible* one, we have created a fixed asset; when a good, which could in its present shape be complementary to many others, is made amenable to complementarity only in a single, or very few, ways, we have created a fixed asset. [...] Incidentally, it may be observed that those who proceed in that way, do that because they believe that for a long time, or at least for the time which is necessary to carry on their

speculation, *the existing division of labor will last and the present demand and supply of those complementary goods which, together with their product, contribute to the formation of some first order goods will continue*; or, if they have foreseen some variations, they have foreseen them to be such that they are still profitable to their business. These calculations and these forecasts are tremendously volatile, and the frequent crises are perhaps the sign that the premium required by those who make their assets fixed is, in very many cases, not at all commensurate to the risk. (*ibid.*, pp. 161-3, emphasis added)

What can be argued from these words is that: *i*) the specialisation of a piece of wealth originally capable of many uses is an irreversible act; *ii*) such specialisation creates a fixed asset; *iii*) the act's irreversibility entails that the rational agent has foreseen stationary conditions in the economic system, that is, that the latter's structure should remain unchanged or evolve in a regular and foreseeable way. The three statements together reveal the *intertemporal* character of the theory of fixed assets.

It is by embracing a fully dynamic approach that Pantaleoni achieves his most surprising result in *La caduta*, namely, a peculiar connection between the Smithian notions of division of labour and market extent on the one side, and the LDP and the fixed assets on the other. He starts from the observation that economic progress affects market size, both in the sense of triggering the growth of some markets and in the sense of causing the shrinking of some others (*ibid.*, p. 156). In particular, the latter possibility occurs in the markets for production factors and intermediate goods. What happens is that the engine of progress, the division of labour, leads each factor, including labour, to specialise its offer of productive services; at the same time, any intermediate good becomes ever more targeted to one and only one employment. Hence, he claims that:

it is much the same thing to say 'division of Labour' and to say: every worker tends to become capable of performing in the most perfect way *only one task*, and thus incapable of doing anything else; and also to say that every good tends to become especially suited for only one specialized employment, and thus useless for any other. (*ibid.*, original emphasis)

It follows as a corollary no less than the violation of the classic Smithian mechanism, according to which the increase in the division of labour causes the expansion of the market which in turn furthers the division of labour, and so on. It is by negating the general applicability of this mechanism that Pantaleoni links the progress in the division of labour to the rising complementarity among goods. Specialisation determines an increase in the number of complementary commodities and in the rigidity of their interdependencies as regulated by the LDP. But as the market for any complementary good becomes more restricted the more the good becomes specialised, and we know from earlier discussion that market size is the key feature determining the liquidity of any good, that is, its degree of 'fixity'. It follows that the progress in the division of labour leads to a general diminution in the marketability of commodities, that is, to an increasing proportion of fixed assets with respect to liquid ones (*ibid.*, p. 157).

Pantaleoni's thesis may be summarised with the following chain of implications:

increase in the division of labour  $\Rightarrow$  increase in goods' and factors' specialisation  $\Rightarrow$  more binding LDP  $\Rightarrow$  reduction in the market size  $\Rightarrow$

reduction of the liquidity of goods  $\Rightarrow$  increase in the absolute and relative importance of fixed assets, esp. in the firms' production structure.

The thesis, questionable as it is,<sup>28</sup> has obvious implications for the dynamics of an economic system, especially with respect to its sensitivity to exogenous shocks and other negative events (see above, section 5), as well as to its potential for further development. What is perhaps less obvious is the role that the two institutions which continuously interact with the fixed assets, the money and the bank, may play in reducing the drawbacks of the system's excessive rigidity.

## 7 Money and Banks as Flexibility Tools

Modern heterodox economists have investigated at length the working of an economy under conditions of structural instability and 'true' uncertainty. By the term *structural stability*, I mean the property of an economic system to preserve its structure when it is affected by a (small) disturbance. A system's *structure* is, in turn, given by the set of the oriented links among its variables and by the matrix of its coefficients.<sup>29</sup> The term '*true*' uncertainty refers to uncertainty in Keynes's and Knight's sense, that is, to the impossibility of completely defining a probability distribution (be it objective or subjective) for future events.<sup>30</sup>

Post Keynesian authors have emphasised that the economic system is non-ergodic, that is, it exhibits processes such that 'the expectations based on past probability distribution functions can differ persistently from the time averages that will be generated as the future unfolds and become historical fact' (Davidson 1991, p. 133).<sup>31</sup> Non-ergodicity entails that the economy is, on the one side, open to structural breaks and irreversible in its unfolding and, on the other, that it is far from being a closed universe where individual choices take place inside a complete set of alternatives and states of the world. 'True' uncertainty originates from the lack of such a complete set, and thus of at least part of the information agents need to make their forecasts and decisions. In a non-ergodic environment, the future – and thus the environment itself – is never given, as it emerges from the aggregation of the decisions of individuals: it is something to be *built*, not a set of states of the world to be *discovered*.<sup>32</sup>

Following these definitions, I claim that the environment of Pantaleoni's 'impure' theory is a non-ergodic one, where phenomena of structural instability and irreversibility may occur and where uncertainty cannot be dealt with parametrically, because it is 'true' uncertainty. To borrow Pantaleoni's terminology, it is the environment of *complex ordo fiendi phenomena*.

The latter expression features in the classification of 'L'atto economico' (Pantaleoni 1913 [1925a], pp. 67-75), where economic phenomena are divided into three groups, the discriminating feature being the presence of *causality* or just of a '*concourse of conditions*'. The former term refers to 'phenomena which are connected by a necessary order of presentation in time', the latter to 'phenomena which are necessarily and contemporaneously coordinated' (*ibid.*, p. 71). Pantaleoni calls *ordo essendi* those phenomena where no causality exists, but only 'a group of conditions which are connected between them by reciprocal necessity', and *ordo fiendi* those phenomena which show a causal nexus. The latter are in turn divided into *simple* and *complex* ones, depending on the existence of interdependence between causes and effects. He claims that, while his friend Pareto's 'pure' general equilibrium theory is in the realm of *ordo essendi* phenomena, real world events partake of the *ordo fiendi* nature, especially of the



complex kind, typical of all those very frequent phenomena 'where we should never neglect the *reaction* that the outcome causes to the conditions which generated it, a reaction which is such that any *new* effect has among the causes generating it the reaction itself' (*ibid.*, pp. 71-2).

The pervasiveness of these complex causal phenomena seems consistent with the basic Post Keynesian setup. Indeed, any agent's choice triggers a feedback mechanism, which irreversibly modifies the structure of the economic system, determining new choice situations which were neither foreseen nor foreseeable when the initial choice was taken. This confirms that the environment of Pantaleoni's 'impure' theory is a non-ergodic one of 'true' uncertainty, irreversibility and structural instability.<sup>33</sup>

It is in such an environment that the Pantaleonian agent has to make her exchange and investment choices. In particular, her decisions have to take into account the circumstance that, through the action of the LDP, the progress in the division of labour determines a rising proportion of fixed assets. This means that choices take place in an ever more rigid environment, so much so that their profitability depends ever more crucially on the existence and preservation of stability conditions in the system's structure. Yet, these conditions are never met in reality because of the pervasive presence of 'true' uncertainty; hence, any expectation supporting the agent's choice is likely to be disconfirmed. To say it differently, each time an investment or exchange decision is made, the degree of rigidity of the economic system is enhanced, and with it also the chance that the choice itself may turn out wrong on account of some unforeseen event.

The agents' rational reaction in a moneyless economy would be to avoid making decisions entailing a long-term commitment, that is, which might be modified, if the future course of events requires it, only at a very high cost. At the system level, the outcome would be very few investments, a slowing-down in the division of labour and a reduction in the rate of economic development. Pantaleoni views this as the inevitable effect of the interplay between the division of labour and the fixed assets in a barter economy populated by non-perfectly rational agents affected by 'true' uncertainty. In terms of the aforementioned general factors of crisis, the increasing extent to which assets are fixed makes the agents' mistakes in saving and investment choices so frequent and expensive as to cause the outburst of severe mismatching crises. As a defensive reaction, agents would then abstain from long-term commitments, thereby triggering another factor of crisis, namely, under-investment. In short, in Pantaleoni's world of 'impure' theory, a barter economy is plagued by anti-development forces and endogenous motives of crisis.

Luckily, some institutions have emerged with the specific goal of diminishing the perverse effect of the combination of rigidity and uncertainty. Two of them, the money and the bank, are crucial in Pantaleoni's theoretical edifice, as their primary goal is the loosening of the economy's real rigidities in order to protect it from unforeseen shocks and structural instability. Money as a means of exchange allows agents to overcome the limitations imposed by the composition of their endowments. Banks as pure intermediaries allow agents to make up for the fixed assets' constraints and the joint action of the LDP and the FEC. In short, both institutions represent a sort of 'safety valve' for too-rigidly constrained agents and systems.

Thus, when account is made of the implications of Pantaleoni's 'impure' theory, it is straightforward to argue that the key notion to grasp in his theory of money and banking is that of *flexibility*. Money and banks are first and foremost

flexibility tools, designed to allow economic agents to make those long-term commitments which are necessary for economic development, but which would not be made for fear of the potential costs entailed by any excessively rigid position in an uncertain and unstable environment. It follows that money and banks have relevant *real* effects, for the simple reason that without them little or no economic progress would be possible.<sup>34</sup>

What is flexibility? The notion is richer than the other concepts we have met so far, like marketability, liquidity or market size. First of all, flexibility may be defined in opposition to the notion of rigidity, which, as we know from Pantaleoni's definition of fixed assets, refers to the impossibility of modifying the employment of resources without suffering huge losses. Second, flexibility is the only notion providing a rationale for the agents' long-term choices in a world where the list of states is open and continuously changing, that is, in a world exhibiting 'true' uncertainty and structural instability. Third, flexibility must be characterised as an explicitly dynamic notion: this can be done by taking into account the two kinds of flexible choices an agent may make and which correspond to the two dimensions of flexibility itself.

Flexibility as a *negative* choice refers to the possibility of suspending or postponing choice, that is, to a sort of wait-and-see behaviour: 'In a world of uncertainty, he who hesitates is saved to make a decision another day' (Davidson 1972, p. 16). This corresponds to the first dimension of flexibility as *width* of the opportunity set: an economic position is the more flexible the larger the number of future options it leaves open at a given cost.<sup>35</sup> Flexibility as a *positive* choice refers to the agent's power to exploit her flexible position to increase the return on her intertemporal choices. This corresponds to the second dimension of flexibility as the possibility to *create* new economic opportunities.

It is natural to associate negative flexibility with the function of money as a store of value against an uncertain future (Keynes 1937). Money is a 'time machine' (Davidson 1996, p. 64) which allows purchasing power to be transferred from present to future and long-term commitments to be postponed until new, better information arrives. Holding money, either in cash or a bank deposit, is the best way to enlarge an agent's opportunity set, so much so that a major motive for demanding money is just the desire to possess an ample store of options. This, it should be noted, holds, regardless of any precautionary motive: there may well exist several financial instruments safer than cash or bank deposits, but none of them enjoys the same degree of negative flexibility. In other words, the money-holder's possible losses in terms of purchasing power are more than compensated by the potential gains in terms of open opportunities to profitably exploit the new information she will get in the future.

Positive flexibility is directly related to the agent's action to maximise her intertemporal return and, therefore, to the idea that the list of states of the world is not closed. The value of a flexible position is that of the new opportunities it allows to be created; hence, positive flexibility is synonymous with the agent's potential to modify the future by opening new dynamic paths for the economic system. By taking into account such a positive dimension, we acknowledge that behind an agent's choice of flexibility lies his willingness to act as an *option-maker*, rather than as a mere *option-taker*.<sup>36</sup> Money and banks are powerful tools of positive flexibility: money through its main function of means of exchange, which facilitates an ever-increasing degree of economic interdependence by lubricating the engine for the transformation of the economic environment; and banks through

their main function of credit allocation, which makes it possible for entrepreneurs to invent new products, markets and methods, and create a new future for the economic system.

From what I said before, both notions of flexibility can be traced back to Pantaleoni's views on money and banking. Though the idea of money and banks as tools of negative and positive flexibility was present in previous authors, such as Ferrara and Menger, it was Pantaleoni who put so much weight on it. Take for example his *La caduta*. There we can find several references to flexibility as a negative choice in the face of the uncertainty and instability of the economic system – indeed, the entire analysis of fixed assets may be read in these terms. Moreover, the notion of money as the most liquid good and the only one not subjected to the LDP also satisfies the definition of negative flexibility. As to the positive dimension, it is natural to link it to Pantaleoni's idea of money as the purest instrumental good; above all, positive flexibility lies at the core of his entire analysis of the nature and functions of banks.<sup>37</sup> We know that the Pantaleonian bank is essential to allow the entrepreneur to make her investment choices – in particular, to start *new* and *different* production processes. This can also be read as the claim that bank credit is a tool of positive flexibility enabling the entrepreneur to 'destroy' the existing fixed assets and get new ones, that is, to act as a true option-maker.

## 8 Conclusion

In this paper I have tried to shed light on some of the forerunners of the idea of money and banks as tools of flexibility that are indispensable for economic development. The authors I have examined are Francesco Ferrara, Carl Menger and, above all, Maffeo Pantaleoni.

As far as Ferrara is concerned, I explained how he stressed the creative power of credit. This led him close to the modern notion of flexibility as a *purely* positive choice. As to Menger, I showed how he theorised about the qualitative jump made by that very good which happens to become money, that is, the only means giving the certainty, rather than the mere probability, of marketability at an economic price. It follows that, in Menger's terms, holding money is a *purely* negative choice, aimed at building a store of future exchange options.<sup>38</sup>

Yet, it is in Pantaleoni that we find strong evidence of *both* kinds of flexibility. The Italian economist considered the first and foremost function of both money and banks to be that of ensuring the flexibility of the economic system. It was this flexibility which allowed the system to overcome the obstacles placed on its working and development by the spread of the fixed assets and the presence of 'true' uncertainty.

This conclusion holds of course only in the Pantaleonian world of 'impure' theory. Indeed, those perfectly rational agents of 'pure' theory, who live in a 'closed' universe which is 'out there', ready to be fully understood and foreseen, do not have any need to avail themselves of negative flexibility. Nor do they need positive flexibility: theirs is a world devoid of novelty and creation, where the only problem to be solved is the optimal allocation of the given resources under conditions of measurable uncertainty and structural stability – in short, the world of what in his famous 1909 essay Pantaleoni called first-kind dynamics (Pantaleoni 1909 [1925], p. 77). The instruments and methods to investigate such a world had

already been developed by Walras and Pareto, so much so that there was nothing else to be discovered.

What was completely lacking, however, was the proper set of tools to analyse the realm of 'impure' theory (*ibid.*, p. 82). It was in order to fill this void that, in the early years of the twentieth century, Pantaleoni embarked on his last great intellectual challenge, the exploration of a brand-new kind of economic dynamics – called second-kind dynamics – independent of the notion of equilibrium. The theory of money and banking he had developed at the turn of the century may thus be considered an instrument for, and a first step towards, this challenge. And those modern heterodox economists who focus on the themes of uncertainty, disequilibrium and structural instability may well be considered the legitimate, though often unwitting, heirs of his endeavour.

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## Notes

1 One of the referees suggested that the Scottish economist Henry D. Macleod – whose works Pantaleoni knew well and quoted a few times in the *Principii* and whose 1855 *The Theory and Practice of Banking* had been translated into Italian (Macleod 1879) – preceded several of the Italian economist's views on money and credit (see, for example, Macleod 1889-1891). However, we should never forget that, as noted by Skaggs (2003), the connection between finance and economic development, which was Macleod's most important contribution as well as one of the key implications of Pantaleoni's analysis (see section 6), has been almost completely neglected by both classical and early neoclassical economists. This connection was relegated to the 'underground world' of outsiders, such as Macleod, until the second half of the twentieth century. This makes it all the more remarkable that a famous, well-connected, orthodox economist like Pantaleoni might share similar views.

2 On Pantaleoni's general economics, see, in English, Becattini (1987) and Groenewegen (1998).

3 Also see Ferrara (1873 [1985]; 1934, Part II: pp. 364-73 and Chapter XV, Part IV: Chapter XI, Part VI: Chapter IV). On Ferrara's economics, see, in English, Weinberger (1940) and Bonaccorsi di Patti (2001).

4 With the only exception of passages taken from Pantaleoni (1898 [1957]), all the following translations from Italian are mine.

5 For the distinction between metallism and cartalism and between the theoretical and the practical approach to both, see Schumpeter (1954 [1997], pp. 288-9).

6 Also see Ferrara (1934, volume II, p. 666). Here Ferrara clearly confuses the logical nature of money with its historical origin: on this common mistake, see Schumpeter (1997, pp. 62-4, 288-9).

7 Ferrara's example is unfortunate because we now take the value of any piece of land to be equal to the capitalisation of its future revenues, so much so that it is as 'expectational' as that of the future harvest.

8 On Menger's economics, see Caldwell (1990).

9 The first term is used by the 1976 English translators of the *Grundsätze*, the latter by Menger himself in the 1892 essay. The German term is *Absatzfähigkeit*.

10 *Wirtschaftlichen Preis*: see Menger (1994, p. 248; 1892, p. 245, fn.)

11 This, according to Menger, explains why the demand for high-marketability goods was originally independent of these goods being recognised as 'money': their higher marketability simply made it rational for agents to own them. Their use in exchange eventually became a custom leading to the birth of money (Menger 1994, pp. 260-1). Note here the same confusion mentioned above in endnote 6.

12 As I will argue below, these two features correspond to the two motives guiding the liquidity choice in Pantaleoni's theory: the desire to hold a reserve of value ('negative' choice) and the desire to hold the means of exchange, that is, a means that can be used to transform one's own asset position ('positive' choice).

13 Here the 1898 English translation betrays the Italian original, which more emphatically reads as: 'at exchange ratios which are probably not unfavorable, always available and guaranteed'.

14 However, given that the most common way to store capital is in monetary terms, any change in the money supply may have a transitory effect on the interest rate (Pantaleoni 1957, pp. 262-3).

15 Remarkably, this was also Schumpeter's view: see Schumpeter (1997, p. 857).

16 Note that I will not deal with another classic issue of Pantaleoni's 'pure' monetary theory, the analysis of the value of money: see Pantaleoni (1957, pp. 227-31).

17 According to Pantaleoni, money is an exception to Gossen's law of the final degree of utility because it is the only good which exhibits no differential utility (Pantaleoni 1957, pp. 76-8). This seems to follow from Ferrara's remark that 'the quantity [read: measurability] is what is cancelled from the notion of utility whenever a good is raised to the status of money' (Ferrara 1961, p. 279), at least as much as from the standard Marshallian assumption of a constant marginal utility of money.

18 Note that this position also prevents him from committing the same mistake of Ferrara and Menger, that is, confusing the logical nature of money with its historical origin. The latter issue is dealt with in quite a sketchy manner by Pantaleoni (1957, p. 225, text and fn.2).

19 In this and the next sections I will make use of the generic term 'bank'. This, however, betrays Pantaleoni's thought, as he referred to just a specific kind of bank, namely, those *istituti di credito mobiliare* that, in the German-based tradition which has dominated the Italian banking system until very recently, should be distinguished from the *istituti di credito fondiario*: the former deal only with *personal* property and assets (where the word 'personal' is used in its legal meaning, that is, as a synonym with 'movable' and an opposite to 'real'), the latter with *real* property and assets (that is, 'immovable' wealth such as land, buildings, and so on.).

20 The essay was originally published in the April, May and November issues of the then widely internationally read *Giornale degli Economisti*. Other key works on banking theory are Pantaleoni (1915 [1936a]; 1924 [1936b]).

21 See above, endnote 19.

22 An accounting approach to the working of financial institutions, including a careful investigation of the structure of their credits and debts, seems indeed crucial for any research on the relation between finance and economic development. For a similar view see Skaggs (2003, pp. 368, 377).

23 This recalls Ferrara's idea that credit is a bridge between a present and a future value: see section 2.

24 We can trace here some similarities with Macleod's analysis (see endnote 1). Also the Scottish economist perceived a world full of profitable opportunities, ready to be exploited if only entrepreneurs could obtain the capital necessary to them; hence, banks' activity was not neutral to economic development. See, for example, Macleod 1889-1891, pp. 386 ff.; Skaggs 2003, p. 368.

25 Pantaleoni (1909 [1925]). On this essay see Giocoli (2003).

26 See endnote 24 above. Yet, contrary to Macleod (1889-1891, p. 387), Pantaleoni has no need to assume the existence of 'inactive' resources, but only of the rigidities entailed by the LDP. For a possible reconciliation between the two approaches, see below, endnote 34.

27 In Italian, *immobilizzazioni* – literally, immovable assets.

28 For a series of possible objections, see Bellanca and Giocoli (1998, pp. 142-4).

29 For these definitions see, respectively, Gandolfo (1987, p. 462), and Vercelli (1991, pp. 54-6).

30 For a classic statement of Keynesian uncertainty, see Davidson (1991). Also see, more recently, Fontana and Gerrard (2004).

31 A stochastic process is said to be ergodic when the average of its future outcomes is never persistently different from the average calculated from past observations, that is, when the future is just a reflection of the past. The rejection of the ergodicity postulate of neoclassical economics is the pillar of the Post Keynesian approach: see, for the example, the exchange between Davidson (2005) and Lavoie (2005).

32 Hence bounded rationality is not strictly necessary: even if the decision-maker enjoys 'divine' cognitive and computational abilities as in neoclassical models, the relevant information upon which she should base her calculations simply do not exist. See Fontana (2000).

33 Of course we do not wish to downplay the differences still separating even the 'impure' Pantaleoni from the Post Keynesians on several crucial issues of monetary and banking theory, first and foremost the idea of banks as pure intermediaries.

34 If we admit that, for fear of excessive rigidity, some resources may remain unemployed, it is not difficult to reconcile Pantaleoni's view with Macleod's: see endnote 26 above. Moreover, it turns out that, together with the Post Keynesians, the modern supporters of a financial approach to economic development (following Gurley and Shaw 1960) may find a forerunner in Pantaleoni's analysis.

35 See the definition by Jones and Ostroy 1984, who however fail to mention Pantaleoni in their brief historical survey of the forerunners of the notion of (negative) flexibility.

36 See Levine 1997.

37 Not to mention, of course, Pantaleoni's 1909 theory of disequilibrium dynamics, on which see Giocoli (2003).

38 Yet, there are also clues of a positive notion of flexibility. We know in fact that, in Menger's view, by allowing every agent to transform his market position and become independent of the other agents' choices, money effectively redistributes market power.

## References

- Becattini, G. 1987. 'Pantaleoni, Maffeo', in J. Eatwell, M. Milgate and P. Newman (eds), *The New Palgrave: A Dictionary of Economics*, London: Macmillan, Volume 3, p. 794.
- Bellanca, N. and Giocoli, N. 1998. *Maffeo Pantaleoni. Il principe degli economisti italiani*. Firenze: Polistampa.
- Bonaccorsi di Patti, E. 2001. 'Francesco Ferrara and subjective value theory', *History of Political Economy*, 33(2), pp. 315-44.
- Caldwell, B. (ed.) 1990. *Carl Menger and His Legacy in Economics*. Durham: Duke University Press.
- Davidson, P. 1972. *Money and the Real World*. London: Macmillan.
- Davidson, P. 1991. 'Is probability theory relevant for uncertainty? A Post Keynesian perspective', *Journal of Economic Perspectives*, 5(1), pp. 129-43.

- Davidson, P. 1996. *Post Keynesian Macroeconomic Theory*. Aldershot: Elgar.
- Davidson, P. 2005. 'Responses to Lavoie, King, and Dow on what Post Keynesianism is and who is a Post Keynesian', *Journal of Post Keynesian Economics*, 27(3), pp. 393-408.
- Ferrara, F. 1856 [1961]. 'Della moneta e dei suoi surrogati', in F. Ferrara, *Opere complete*, Volume V: *Prefazioni alla Biblioteca dell'Economista*. Roma: ABI – Banca d'Italia, pp. 3-303.
- Ferrara, F. 1873 [1985]. 'La questione dei banchi in Italia', in G. Martinengo and P. C. Padoan (editors), *Le crisi finanziarie*. Bologna: Il Mulino, pp. 41-54.
- Ferrara, F. 1934. *Lezioni di economia politica*. Bologna: Zanichelli.
- Fontana, G. 2000. 'Post Keynesians and Circuitists on money and uncertainty: an attempt at generality', *Journal of Post Keynesian Economics*, 23(1), pp. 27-48.
- Fontana, G. and Gerrard, B. 2004. 'A Post Keynesian theory of decision making under uncertainty', *Journal of Economic Psychology*, 25, pp. 619-37.
- Gandolfo, G. 1987. 'Stability', in J. Eatwell, M. Milgate and P. Newman (eds), *The New Palgrave: A Dictionary of Economics*. London: Macmillan, Volume 4, pp. 461-4.
- Giocoli, N. 2003. 'Structural change and "new facts" in Pantaleoni's non-equilibrium dynamics', *Structural Change and Economic Dynamics*, 14, pp. 213-36.
- Groenewegen, P. D. 1998. 'Maffeo Pantaleoni', in F. Meacci (ed.), *Italian Economists of the 20th Century*. Cheltenham: Elgar.
- Gurley, J. G. and Shaw, E. S. 1960. *Money in a Theory of Finance*. Washington, D.C.: The Brookings Institution.
- Jones, R. A. and Ostroy, J. M. 1984. 'Flexibility and uncertainty', *Review of Economic Studies*, 51, pp. 13-32.
- Keynes, J. M. 1937. 'The general theory of employment', *Quarterly Journal of Economics*, 51(2), pp. 209-23.
- Lavoie, M. 2005. 'Changing definitions: a comment on Davidson's critique of King's history of Post Keynesianism', *Journal of Post Keynesian Economics*, 27(3), pp. 371-6.
- Levine, D. 1997. 'Knowing and acting: on uncertainty in Economics', *Review of Political Economy*, 9(1), pp. 5-17.
- Macleod, H. D. 1855 [1879]. *La teoria e la pratica delle banche* (Italian translation of *The Theory and Practice of Banking*), in G. Boccardo (ed.), *Biblioteca dell'Economista – Terza Serie*, Volume VI. Torino: UTET.
- Macleod, H. D. 1889-1891. *The Theory of Credit*, two volumes. London: Longmans, Green & Co.
- Marshall, A. 1961. *Principles of Economics*, 9th (variorum) edition. London: Macmillan.
- Menger, C. 1871 [1994]. *Principles of Economics*. Grove City, PA: Libertarian Press.
- Menger, C. 1892. 'On the origin of money', *Economic Journal*, 2(6), pp. 239-55.
- Pantaleoni, M. 1895 [1977]. *La caduta della Società Generale di Credito Mobiliare Italiano*. Milano: Giuffrè.
- Pantaleoni, M. 1898 [1957]. *Pure Economics*. New York: A. M. Kelley. English translation of M. Pantaleoni, *Principii di economia pura* (1889).

- Pantaleoni, M. 1906-07. *Lezioni di economia politica*. Roma: Associazione Universitaria Romana.
- Pantaleoni, M. 1909 [1925]. 'Di alcuni fenomeni di dinamica economica', in M. Pantaleoni, *Erotemi di Economia*. Bari: Laterza, Volume II, pp. 75-127.
- Pantaleoni, M. 1913 [1925a]. 'L'atto economico', in M. Pantaleoni, *Erotemi di Economia*. Bari: Laterza, Volume I, pp. 67-155.
- Pantaleoni, M. 1915 [1936a]. 'Istituti di credito mobiliare italiani o esteri', in M. Pantaleoni, *Studi storici di Economia*. Bologna: Zanichelli, pp. 470-85.
- Pantaleoni, M. 1924 [1936b]. 'Le Casse di risparmio e gli Istituti bancari', in M. Pantaleoni, *Studi storici di Economia*. Bologna: Zanichelli, pp. 503-30.
- Schumpeter, J. A. 1954 [1997]. *History of Economic Analysis*. London: Routledge.
- Skaggs, N. T. 2003. 'H. D. Macleod and the origins of the theory of finance in economic development', *History of Political Economy*, 35(3), pp. 361-84.
- Vercelli, A. 1991. *Methodological Foundations of Macroeconomics: Keynes and Lucas*. Cambridge, UK: Cambridge University Press.
- Weinberger, O. 1940. 'The importance of Francesco Ferrara in the history of economic thought', *Journal of Political Economy*, 48 (February), pp. 91-104.