COMPARATIVE VIEWS ON L. WALRAS AND A. COURNOT ON THE REGULATION OF PAPER MONEY: RULES VS. DISCRETION AT THE END OF THE XIXTH CENTURY.

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Abstract

This paper presents Léon Walras and Augustin Cournot views on monetary regulation. Important differences can be found in their views about the convenience of the issuing of paper money and fiat money in general. Whereas Walras is against bank notes, even if coming from a central bank, Cournot has a moderate position. He accepts the need for bank notes even without a strict adjustment to metal reserves. It can be ascertained that Cournot believes discretionary monetary regulation is convenient and acceptable, while Walras believes the only acceptable monetary system is one based exclusively on the stability of the value of money under a monetary rule following the strict equivalence between metallic reserves and a pure medium of exchange form of money. This paper shows Cournot’s ability to understand more clearly than Walras the evolution of the monetary system of his days. Whereas Walras is trying to guarantee the coherence of his pure theory with his applied theory, and he is then unable to accept the evolution toward a monetary system based on fiat money and he proposes very rigid and complex system of quasi-bimetallic circulation where banks are simple mediators between entrepreneurs and savings.

JEL Codes: B13 - B31 - E58 - E40

Keywords: Central Bank, Paper-Money, History of Monetary Thinking, Léon Walras, Augustin Cournot.
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**Documentos FCE**
**Escuela de Economía**
**ISSN 2011-6322**

La serie Documentos FCE puede ser consultada en el portal virtual: [http://www.fce.unal.edu.co/publicaciones/](http://www.fce.unal.edu.co/publicaciones/)

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Introduction

The second half of the XIXth century is a period of great transformations in monetary history. The crisis of metallic systems and the expansion of fiat money are some of the salient events of the time. In the particular case of the French monetary system, the most significant issue, from 1848 until the end of the century, was the expansion of the Bank of France and its consequent *de facto* monopoly of note issue to the entire national territory\(^2\) and some periods of non convertibility. Even with an important expansion of Bank of France’s paper-money under Napoleon’s First Empire the French monetary system was far from the development of the paper-money circulation attained by England or even by northern European countries.

The period of the “Parisian monopoly” of the Bank of France was followed by a short period of a more free legislation on the creation of private banks from 1866 until 1873, when it was brutally stopped by a succession of political and monetary crisis. As a result, the French banking system fell behind compared with similar countries. This relative underdevelopment of the banking system is also related with a general feeling of apprehension of French people about non-metallic money and a succession of monetary and social crisis during the first half of XIX\(^{th}\) century. However, the main intellectual debate, in France, on monetary matters around the second half of that century became the instauration of a system of free banking\(^3\) against a paper-money monopoly in the hands of the Bank of France. A group of very influent policy makers, opinion-makers and professional economists revived the defense of *laissez-faire* systems of bank money issue. In the meanwhile in England, the well known debate between the so-called *banking* and *currency schools* finished with the triumph of the latter,

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\(^2\) In 1803 Bonaparte gives the Bank of France the monopoly of note issue for the Parisian region only while there were an important number of regional banks issuing notes. But regional paper money never acquired national circulation, not because of a legal reason, which eliminated only the Parisian competitors of the Bank of France, but because of their lack of “credibility” outside their original region. See (Wolowski, 1864, pág. iii) and (Davies, 2002, pággs. 555-567).

\(^3\) Some authors sustain there existed a period of free banking in France before 1803, however, as has been said, regional paper-money had very restricted circulation whereas the Bank of France’s paper money had a broader circulation beyond the Parisian.
imposing a very conservative policy on the Bank of England concerning paper-money supply.

In this context a theoretical revolution was taking place in economics: the so called Marginal Revolution. Two significant French authors emerge, one as a forerunner and another as a main figure of this intellectual movement: Augustin Cournot and Léon Walras. As most of the authors of the Marginal Revolution they devoted a lot of intellectual effort and produced some ideas on monetary theory. However, even their contributions were directed to participate in the crucial monetary debates of their time, they occupied a particular place beyond the pure applied issues on the management of money supply.

They participated in those debates as pure theoreticians and as revolutionary thinkers. They were stood upon their solid theoretical frameworks. However, accepting that they agreed on their views regarding those fundamental matters and neglected the historical changes is losing sight of the theoretical richness that springs from the differences between them in particular pertaining monetary issues. In what follows, I try to bring forth this theoretical richness analyzing the positions of these great French economists on paper-money.

The changes in the economy had an important influence on their own theoretical contributions to the transformation of economics. Nevertheless, most of the analysis on these authors has focused on their theoretical positions. Their contributions aside from pure theory came to be considered, in the best of cases as pure theoretical speculation, and most of the time as a minor part of their works. Little attention has been given to their views on economic policy and economic regulation. In particular, regarding the regulation of the monetary system, Walras and Cournot, in spite of their proximity in economic and monetary theory, have very different stands. Their greatest differences can be found in their views about the convenience of the issuing of paper money and fiat money in general. Whereas Walras is against bank notes, even if coming from a central bank, Cournot has a more moderate position. He accepts the need for bank notes even without a strict adjustment to metal reserves. It can be ascertained that Cournot believes discretionary monetary regulation is convenient and acceptable, while Walras believes the only acceptable
monetary system is one based exclusively on the stability of the value of money under a monetary rule following the strict equivalence between metallic reserves (bimetal to be exact) and circulating money.

This paper aims at bringing forth the reasons that explain this difference as a result of the interpretation each one of the authors gives to the empirical facts of the monetary system taking place at the end of the XIXth century. These facts produce diverging developments in each author’s theoretical positions. Walras consolidates an extreme position based on the view of money as a commodity, the value of which is determined as the price of the service of a necessary capital good that assures the circulation of commodities. This good monetary circulation needs to be differentiated from the circulation of bank issued paper-money which lies at the origin of deep real crises through an evil cumulative process distorting economic equilibrium and most importantly economic justice.

Cournot, on his side, conceives money as something in-between a commodity and an institution and makes no special difference between bank issued paper-money and metallic money. This view is most evident in his two non-mathematical economic works published in 1877 which consolidate his position regarding the need and the desirable effects of the existence of paper money, already present in his 1863 work but absent from his well-known mathematical theoretical work from (Cournot, 2001 [1838]).

I will show the difference between these two thinkers and will evidence Cournot’s ability to understand more clearly than Walras the evolution of the monetary system of his days. Walras, instead, trying to guarantee the coherence of his pure theory with his applied theory, is unable to accept the evolution toward a monetary system based on fiat money. This paper then aims at contributing to the differentiation of the authors of the so-called Marginalist School, underlining, once again, the richness of the Marginalist

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4 Revue sommaire des doctrines économiques (Cournot, 1982 [1877]), henceforth Doctrines.
5 Principes de la théorie des richesses (Cournot, 1863), henceforth Principes.
6 It is worth to notice that this last work had an important influence on Walras, who uses it for his own analysis about the determination of the value of money. In fact, in the second edition of his EEPP the 39th lesson concerned the analysis by A. Cournot of the absolute and relative values and in particular on the fluctuations of the value of money.
period and questioning the commonly accepted view of the homogeneity of their ideas.

The paper is structured as follows: in the first section I consider Walras’s approach to the problem of bank issued paper-money as a theoretical construction founded on his pure economics. A critical exposition of his pure theory of money is thus needed before the theory of banking is analyzed. The second section reconstructs Cournot’s main ideas on money and paper-money as they were developed in his non-mathematical economic works. Then, in a third section I present an evaluation of the main differences between both authors viewed against the monetary debates of their time.

Walras’s desideratum for pure metallic-money and the threatening character of paper-money

Walras’s analysis of “circulation” takes us directly from the abstract world of pure theory to a highly practical reality. In fact, Walras considered money as a pure practical object not necessarily having its place within his pure economics. However, the evolution of his monetary theory shows how money becomes an integral part of his *Éléments d’économie politique pure* (henceforth *EEPP*) (Walras, 1988) having its place as the closing device of his whole model. The introduction of a decentralised exchange process implies breaking with the centralised (i.e. well organised) form of the *tâtonnement sur bons*. Beyond this methodological change, it is interesting to note that Walras adds some novelties to the hypothesis of perfect competition in order to integrate his monetary theory. But this is high-risk chirurgical modification because its main goal is to avoid any disturbance of the normative properties of equilibrium allocations.

However, monetary issues are related, even in the pure theoretical arena of his *EEPP*, to the possibility of economic crisis. In fact, we can say that Walras regards monetary circulation as the door to the introduction of natural endogenous sources of crisis, not only as the artificial crisis created by a bad public intervention. Some authors have underestimated the importance of this “devil inside” feature of monetary circulation in Walras’s monetary works. The common view on the walrasian notion of crisis is summarized by this kind of statement:
Perfectly in line with the century-old Classical tradition, and of course with the other marginalist contributions to cycle theory (notably those by Jevons, Marshall, and Menger), a crisis is considered as a short-run, temporary oscillation around a long-run ‘natural' equilibrium determined by ‘real' variables only. (Bridel, 1997, p. 49)

Even if this is true for the Walras’s early (1860’s) works, his studies on money and banking led him considering crisis are not only part of a short-run oscillation triggered only by “real variables”?7 In his Mathematical Theory of Bank Notes (henceforth TMBB8 Walras presents paper-money as a dangerous threat for the real economy: Monetary causes of real crisis. This feature makes most of Walras’s scholars admit TMBB as proof of the deep differences or even incompatibility between his pure and applied economics9. It is precisely on these grounds that I will try to reconstruct an appraise Walras’s attempt to theorize money under its different forms and in particular to disentangle his radical stance against any form of paper-money circulation.

1.2. The nature of money in Walras’s Pure Economics
We have to take a short detour by Walras’s pure theory of money in order to understand the particular nature of paper-money issued by private banks. In his EEPP, after a lot of transformation across different editions10, lesson 29 exposes a general equilibrium analysis of the circulation of money. Beyond the problems11 this analysis could have, our interest here is on the economic nature of money.

As has been often discussed, the epistemological structure of Warlas’s economics is based on the division and interaction between pure and applied economics, the EEPP is the main contribution and synthesis of his pure economics12. This relation is complex but putting it in a nutshell one can say that pure economics represents the ideal functioning of an

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7 Baranzini presents a clearcut analysis of this evolution of Walras’s ideas on crisis (Baranzini, 2001)
8 Théorie mathématique du billet de banque (Walras, 1992) : originally presented in 1879 before the Sociéte Vaudoise des sciences naturelles.
9 See (Baranzini, 2001), (Bauvert, 2004), (Kuenne, 1961) and (Hilton, 1995).
10 See (Bridel, 1997) and (Rebeyrol, 1998) for detailed expositions and discussions on the evolution of Walras’s monetary thought.
11 In a paper coauthored with V. Bignon we exposed a critical discussion on Walras’s monetary theory (Alvarez & Bignon, 2004).
12 See Jaffé (1983)
economy where commutative justice is respected. This simply means that no agent is able to profit from any form of economic power, for example imposing a monopoly price. This assumption is materialized in the hypothesis of price-taking as the basement of perfect competition.

But Walras goes beyond the idea that perfect competition assures commutative justice (or putting it in modern terminology: Pareto efficiency). He introduces other implicit conditions that must be fulfilled in order to assure that a general equilibrium state coincides with a fair allocation, from the commutative justice point of view. Money appears related with one of these conditions in a twofold sense. First, because money is necessary in order for a decentralized exchange economy to attain final (equilibrium) allocations from an initial endowment situation. Second, and more crucial here, because the process of exchange or the circulation of wealth needs to be neutral regarding the real equilibrium allocations. Money must be neutral and the quantity theory rule must hold. This is the result Walras struggled upon along different versions of his pure monetary theory.

In this ideal framework, money is a particular object allowing to solve synchronization between payments and earnings. Demand for money is only motivated by a problem faced by consumer agents (mainly workers): their expenses take place before they receive their earnings. On the other side, entrepreneurs need to have enough money to cover their circulating capital expenses. Both type of agents demand money provided it is a generally accepted medium of exchange.

Money demand is thus based on a simple technological social problem for a decentralized economy. Even if Walras’s explanation is different from the typical “absence of double coincidence problem”, the rationale for monetary circulation is essentially the same: money is demanded as medium of exchange and no other reason is needed. However, Walras introduces a confusion in this theoretical analysis of the nature of money. He presents the stock of money as a form of capital held by agents:
Note the inclusion of money as an asset yielding saleable services; since one sells the **services** of money for one “week” by lending, Walras’ money economy is of necessity one with borrowing and lending, and the coexistence of money and a loan market in it a requisite. (Kuenne, 1961, pág. 96)

The quantity of money that is needed to circulate the entire wealth for a given period is therefore established in the real sphere. It is the solution to the general equilibrium price quantities vectors that solves the necessities of circulation. Of course, Walras recognized that a unit of money can be used in a sequence of different payments, but this velocity of circulation is taken as given and the obvious quantity theory formula (**equation de la circulation**) holds. The consequence of the nature of money as a particular form of capital is dismissed by Walras and he concentrates his argument on the nature of the instantaneous availability service of cash holdings, rather than on the intertemporal feature. However, as I will show further on, this subterfuge cannot last for long as he needs to confront more realistic forms of money, in particular the bank issued paper money.

Walrasian *pure* monetary theory thus results in a very traditional conception of the effects of the quantity of money on nominal prices. They are related in a positive manner. What is more important for our purposes here, money supply is given and exogenous all along this theoretical exposition and money is not a commodity. These last features of Walras’s pure monetary theory are of great importance.

Concerning the non-commodity character of money, even if the monetary circulation of his pure economics is not bank issued paper-money, one can understand that he searched to establish a very general theory of monetary circulation, not only of the circulation of a particular commodity. The crucial challenge raised here is to explain why an object without intrinsic value or real demand can circulate as pure medium of exchange. Walras, as we have seen before, solves this puzzle problem giving a great importance to the desynchronization of payments. In any case, money is not demanded because of a pure financial reason or because of its capacity to preserve value in the medium or a long term. In the **EEPP** money is not a creature of financial markets. This leads us to the other interesting feature just
mentioned: money supply is determined by an endogenous demand for money. This means that no endogenous creation of the monetary object is considered but the quantity necessary to assure the circulation of the real product is endogenously determined. Money is a part of the initial endowments of some agents and Walras only makes some simple analyses of comparative statics concerning the quantity of money in circulation. These analyses are always related to non-explained exogenous shocks. When a different quantity of money is considered, the adjustment variable is the price of the services as medium of exchange furnished by money. Any expansion on the initial money holdings of agents produces a decrease on the price of that service and a consequent rise of prices in terms of money.

After considering the case of a non-commodity form of money, Walras concludes the 30th lesson of EEPP with a short but very important analysis of commodity money. The reasoning is obviously directed towards a theory of the variations on the price of metallic-money. The main conclusion, not surprisingly, stated by Walras is that there exists a natural tendency of the real price of the commodity (in his commodity market) to equalize the purchasing power of its monetary form (i.e. coins). The regulation of the value of money in a metallic system needs to take into account the real price theory: scarcity and utility being the main forces behind.

1.3. The nature of metallic-money in Walras’s Applied Theory of a bimetallic system

The summit of Walras’s attempt to defend the neutrality of money, not only theoretically but also concerning applied economics is condensed in two propositions: The necessity for a bimetallic monetary system and the abolition of bank issued paper-money. Concerning the former, it is the consequence of his main conclusion about the positive relation between the quantity of money and its purchasing power and the historical events Walras faced, namely the depreciation of gold and the instability of the price of silver related to an increase in its international supply.

13 The latter proposition (i.e. the abolition of paper-money) gather our whole attention in the next subsection.
According to Walras the object of any monetary policy is to assure the stability of the price system and to avoid the introduction of a cumulative speculative crisis. Either, deflationary or inflationary spirals lead to a distortion of the price mechanism and *in fine* of redistributive effects distorting the market allocations. If a price system is working properly, that is to say under perfect competition, the resultant price vector guarantees commutative justice. Any redistributive effect is undesirable, provided there is no other normative argument on distributive justice. In particular, money-gold or money-silver holders are exposed to fluctuations on their purchasing power when external shocks on gold and silver markets are experimented by the economy, while the debtors reduce the amount of their debts.

Thus, if a metallic system is the best way to ensure the stability of the monetary supply, this system has drawbacks because of the instability of the prices of gold and silver as commodities. The, sometimes regarded as very curious, system proposed by Walras to avoid those negative consequences of a pure metallic system consist in the adoption of a quasi bi-metallic system based on the circulation of gold species joint with the possibility to introduce a secondary form of species, named “regulator-billon” made in silver, when gold-money becomes scarce (either because of an “exportation” of the metal or an increasing use of it as a industrial input). Walras presents this system as a very rigid rule to maintain price stability. A rule that can even be mathematically established and given to the State in order to apply it. Walras insists on the necessity of the intervention of the State in monetary matters, contrary as he says, to “the dominant tendency towards laissez-faire” (Walras, 1992, pág. 11) of his time. He defends a permanent intervention based on mathematical rules. That is the deep spirit of Walras’s monetary policy.

The mono-metallic system with a quasi bimetallic regulation, other than its evident complexity, is a clear evidence of the nature of money Walras defended: the only form of money that is necessary for the economic

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14 Walras deals with those distributive issues in his works on “La question sociale” (Walras, 1990) and (Walras, 2001)
15 « Le monométallisme-or combiné avec un billon d’argent distinct de la monnaie divisionnaire et qu’on introduirait dans la circulation ou qu’on en retirerait de manière à ce que le prix de l’étalon multiple ne varîât pas » (Walras, 1992, pág. 5)
system to work properly (perfect competition) is a stable metallic medium of exchange. Money supply must be regulated and stabilized and monetary policy needs to guarantee that the quantity of money in circulation does not exceed the necessities of the real price system derived from the general equilibrium equations.

However, historical reality is against Walras’s plans. The existence of a de facto bimetallic circulation and most important the increasing part of paper-money and other forms of payments are a stinging truth Walras understood well:

It is a curious fact, and worth to be noticed concerning monetary theory, that it has been considered as a first progress to adopt money and, when it exists, to consider as a second progress to withdraw it. There are in fact an important number of instruments of payment, whose importance is ever increasing, without the intervention of metallic money. Those are: (...) Credits on books, (...) Exchange letters, (...) Bank notes (...). (Walras, 1988, pp. 517-519)\(^\text{16}\)

The actual monetary circulation is composed of different forms of money. But what can be said, from a theoretical point of view, about those monies? That is the central question Walras is trying to tackle with his apparently purely applied analysis of bank issued-money. We have now the elements to understand the second stronghold of Walras’s monetary policy: the abolition of the bank-issued paper money.

1.4. « Théorie appliqué du billet de banque »: A theory for monetary policy

So far, I have studied the pure theoretical nature of money as exposed in the EEPP and the more applied features of the nature of metallic money. Both aspects are strongly related within Walras’s propositions concerning the abolition of paper-money. I shall show that this radical posture against any form of circulation other than his quasi bimetallic system is based on a difficulty of his pure economics and the necessity to solve it when he develops his applied arguments.

\(^{16}\) My translation and emphasis.
Walras formulated the central question of his TMBB as pure policy matter:

The production of bank notes ought to be made by the State, or by a unique bank endowed of monopoly power conditioned to a strict agenda, or by an undetermined number of free banks? (Walras, 1992, p. 311)

It is worth noting that Walras explicitly considered the difference between an independent and a government controlled central bank. The policy issue at stake is not only the traditional debate on free banking or monopoly. Most of the French participants on this debate (contemporary to Walras) centered their positions on a twofold option: free-banking vs. central bank. The latter being either a public or a private institution. By recognizing the difference between a central bank guided by government changing policies and one guided by a strict rule (i.e. cahier de charges) Walras acknowledge the importance of the debate held in England between the banking and the currency school. However, his answer is very original regarding both forms of the debate. Walras declares a radical opposition against any form of paper-money putting in this way the problem in a different ground: the theoretical discussion on policy matters.

I have noted at the beginning of this exposition on Walras’s theory that his exposition of a pure theory of money has tried to avoid any reference to the capital nature of money holdings. Monetary demand, in the pure theoretical exposition, is determined as a result of the necessity of a medium of exchange in order to assure the circulation of the real value of production. Money supply is thus given by money demand and, I can state it now, artificially established by an equilibrium equation of the money service market from which can be automatically obtained the price of money in terms of a numéraire commodity. Facing this feature of Walras’s theory of money, some scholars have interpreted it as an incompatible theory of monetary supply. Following Bauvert (2004), the general coherence of Walrasian monetary theory is threatened by an exogenous

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17 My translation.
18 One of the most important groups of intellectuals advocating in favor of free banking during the second half of the XIXth century in France is related to the Journal des Économistes (Molinari, Guyot, Bastiat, Chevallier)
money supply in his EEPP that would be incompatible with an endogenous money supply of the TMMB. Even if this is apparently true, as it could be derived from what has been said so far in this text, I have a slightly different interpretation.

Walras’s exposed his radical opposition against any form of fiat money in different places of his pure and applied texts. A common trait of this idea, that is present even before the development of his TMBB, is that there cannot exist a particular commodity or any other object serving as an invariable standard of measure of value\(^\text{19}\). The reason for this is simple: values are in fine determined by subjective elements (subjective scarcity and preferences) and the very idea of an objective standard of measure is incompatible with a subjective theory of value. Nonetheless, the deep nature of money as pure medium of exchange cannot be separated from its use as a standard of value. If every commodity is to be exchanged against money, the actual vector price of the economy is naturally established in a nominal form (in terms of money). However, Walras always tried to avoid this practical evidence by proposing an interesting difference between the commodity serving as numéraire (commodity A in his notation) and the object serving as medium of exchange (commodity U in his notation\(^\text{20}\)). This later being, as I already said, a pure medium of exchange without any other private utility. This implies this object can only change its value, following Walras’s theory of prices, according with its quantity. Any subjective source of value taking a part, the monetary object of the pure economics is obviously neutral and quantity theory holds. This is Walras’s theoretical artifice needed to expose his ideal type system in his pure economics. The conclusion is thus that money supply needs to be adjusted to its demand as medium of exchange if any general perfect competition equilibrium, with the normative properties of it, is to be attained.

Any perturbation of the supply quantity will trigger an increase of the service of availability of money in terms of a numéraire commodity and a consequent diminishing purchase power of money. A last consequence of this conception is that money supply needs to be equal to the medium of exchange demand and the actual price of money in terms of a numéraire

\(^{19}\) See the original 29th lesson of the second edition of the EEPP where he criticized Cournot’s conception of an “absolute” measure of value.

\(^{20}\) See (Walras, 1988, p. 449)
becomes a theoretical tautology. This price is determined by a very simple quantity theory equation and the whole nature of the stock of money as form of capital or a support for savings is neglected. But Walras knew and made it explicit, with his characteristic academic honesty, that the applied monetary questions pushed him to abandon the hypothetical conception of a fixed supply of money.

When the applied theory of money is exposed, the very nature of money as a particular form of capital returns to the front of the scene. Walras is confronted to a very hard problem: all forms of intraperiod media of exchange are forms of capital from an interperiod point of view. The exchange instruments have different forms according to its support as capital. An important question arises here: why did Walras not include this analysis in his pure economics? The answer, according to us, is this: any demand for money as a form of capital opens the door to redistributive and expectational distortions. These distortions lead to an allocation which is different from those which are Pareto optima (or in terms of Walras to distortion of commutative justice).

This interpretation would seem contradictory with the conceptual framework Walras built in order to introduce money within his value theory. That is, an intertemporal framework with capital goods and savings. Walras even establishes a demand for money as a form of capital. Money holdings (encaisse désirée) appears to be a form to conserve wealth. Walras also considers that in pure theoretical situation the whole capital takes a monetary form and it is borrowed by entrepreneurs. Money capital and capitalists savings are identical. Workers’ and landowners’ savings are also monetized. But, when Walras establishes the money supply for an individual he presents it as being the total quantity of money from the last period (savings) minus its own demand as medium of exchange and savings for the next period. Adding for all agents, and given a fixed quantity of money between periods, we can note that in equilibrium the whole monetary demand is zero because the whole supply of money for a given period can only be the amount of savings from the last period:

21 It is important to remember a particular theoretical difference established by Walras: Entrepreneurs are the direct producers, they search to maximize benefits choosing an adequate technique and inputs; Capitalists are the owners of capital, consumers and not producers, lending its capital goods or monetary capital to entrepreneurs and earnings the price or the loan for it.
The left side being the net monetary demand for the actual period \( t \) and the right side the total money supply of the actual period. From which results a nil gross demand for the actual period:

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Transactions(t) + Savings(t) = 0
\]

The mistake made by Walras is due to a flaw definition of the money supply. In fact, when he considers the way an entrepreneur get money in order to pay its input costs other than labor, Walras only considers the case of capitalists lending money to them by the intermediation of a bank. But the banks are a pure device to transfer capitalists deposits (savings) to entrepreneurs. At the end of the period the entrepreneurs have received the necessary quantity of money to repay capitalists and workers by means of their sales. In a stationary state situation, money plays a pure role of medium of exchange transferred between periods (interperiod) in order to realize payments during a given period (intraperiod). But what all this has to do with banks and paper-money? The answer to this question is actually the explanation of Walras’s main concern about the perils of paper-money. When banks are considered from the point of view of pure economics but on the grounds of applied economics, Walras defines them as a particular form of entrepreneurs, with a profit maximizing logic. Being more than a simple automatic booking and money transfer system, as they are as long as pure economics is considered, now the banks have a private economic logic that threatens the whole economic system: the capacity to create a new money supply.

This capacity is carried out by banks when they go beyond the intermediate function and they create themselves a new demand for economic projects. As has been mentioned above, Walras establishes two distinct categories of agents: capitalists and entrepreneurs. The supply of capital goods, of in fine of capital money, is the main role of the formers. Entrepreneurs create products or services and maximize profits by means of sales and technological decisions. The problem with banks is they are “monster” considered from the point of view of this categorization of agents. When a bank decides to lend money to an entrepreneur supported upon no capitalist demand, they are, not only increasing money supply, but also
“artificially” creating a demand for capital. The banks are playing a double role as entrepreneurs and capitalists:

It is needed to go further than Coquelin and declare that paper money issued by banks pushes the limits of credit by allowing banks and bankers to lend money to entrepreneurs without any capitalist. (...) The issue of bank notes up to an amount leads to the increase of the same amount of capital. (Walras, 1992, p. 319)

The entire predictions of pure economics model of money, as exposed in its last version in the EEPP, are jeopardized. In fact, Walras put this problem in terms of a question: which is the difference between metallic and paper money? His answer is this:

[The difference is twofold]: First, metallic money has a value in itself, while bank notes only represent the value of the capital goods they will be traded for, and they have no value when those capital goods lose their value; second, after having lent their metallic money for the first time the banks and bankers are in a way compelled to lend it anew indefinitely, otherwise this value would be idle, whereas the possibility to lend paper money again depends upon people’s will. (Walras, 1992, p. 320)

This increase in capital made by banks issuing paper money means an increase in the capacity of entrepreneurs to buy more capital goods but the production of new capital goods in order to satisfy this demand takes time, says Walras (Op cit. p.321). During this, the only effect is a “nominal” increase in the means of payments and a consequent depreciation of the price of the whole money supply including metallic money.

He thinks the increase in capital goods price disappears as their supply equals their demand the loan is paid back, but the depreciation of metallic money persists. Walras’s explanation is as follows: the increase in money supply (paper and metallic) reduces the price of money by a simple effect of excess supply. The real price of metallic money lowering it is then converted in commodity metal (i.e. gold for the industrial gold market) and then the price of this commodity shrinks. Agents exchange gold for paper

22 My translation.
23 Do not forget that Walras believes in a pure quantity theory of money.
money at the bank and bank issue money paper replaces metallic money as long as the total amount of metal goes out monetary circulation. Beyond this point, an inverse movement takes place. This is the ancient bouillons theory of “gold points”.

But the novelty of Walras’s argument relies upon the particular character of banks as entrepreneurs and artificial-capitalists. If the production of new capital goods to satisfy their demand leads to an increase not only on the demand for capital goods but also of land and labor. Labor and land being inelastic goods, they become more expensive and workers’ and landowners’ savings increase. This savings are transformed in a form of capital less liquid than the paper money issued by banks. This quite complex reasoning leads Walras to consider that paper money is transformed in fine in less liquid assets than metallic money. But what about bankers? The argument above leads to the conclusion that paper money tends to naturally replace metallic money. Walras considers metallic money as the most liquid asset, because it is the only generally acceptable medium of exchange. Bank notes are always subject to uncertainty and even when they circulate as medium of exchange, the time of a real or financial crisis will show an important difference between paper and metallic money (Walras, 1992, p. 338). Bank notes being less liquid than metallic money, it is, following Walras, impossible to transform, as fast as required, paper money into metallic money. Furthermore, as the central part of the argument is that paper money replaces pure liquid capital by less liquid capital, the bankers are always promising something they cannot afford.

Walras explains also that this argument against paper money holds whether there is free banking or a monopolist central bank. This also holds even if there is perfect competition in the banking system or a very rigid rule imposed to a central bank. Walras considers that paper money opens the door to a too important number of distortions of the exchange system and those distortions are unavoidable.
1.5. Walras’s monetary regulation: no Central Bank please, we need a strict rule!

Even if the complex arguments exposed by Walras to present such an extreme conclusions present some flaws, my main interest here was to show that his rejection of any paper money circulation is constructed upon theoretical arguments directly derived from his pure economics framework. In fact, the problem with banks is not their capacity to profit from their particular position as creators of money and capital. That is to say, the arguments against banks is not based on a violation of the commutative justice as is the argument against natural monopolies (Walras, 1992). In the case of monopoly, the main concern of Walras is the capacity of those agents to impose their will by means of their market power. Natural monopolies must be nationalized, as it is clearly stated by him concerning railways and land. But banks are not by nature monopolists because competition among paper money is perfectly possible. Walras quotes Coquelin and other famous enthusiasts of the free banking system. He even published some papers in the *Journal des économistes* himself. He admits the possibility of competition among banks to keep them producing reasonable amounts of paper money.

The issue, following Walras, is to be tackled from a different point of view. Allowing paper money circulation leads to the introduction of an in internal source of perturbation. A real variable (i.e. an entrepreneurial activity or a supply of paper money matching a real demand in case of a Central Bank) opening the door to a distortion of equilibrium results and of the stationary system of the EEPP.

Every form of fiat money represents the same risk for the economy. The only monetary system guaranteeing general equilibrium perfect competition allocations without introducing the possibility of endogenous crisis is a system based on a commodity money, and in particular a quasi-bimetallic system regulated by a very strict rule of circulation. This means, Walras did not support a Central Bank producing paper money but he actually proposes a system of monetary circulation with a permanent intervention of the State according to a very strict mathematical rule. No place for discretionary policy is given to this monetary authority. But this is
not a Central Bank capable to produce paper money, but a regulation authority of the market for gold and silver which must be confound with the market of money. The goal of this authority is to maintain a stable price of it through a permanent mechanism of monitoring and intervention. This is similar to the function of modern Central Banks regulating a fixed exchange rate.

We are now able to compare these very complexes arguments of Walras with the much more simple and “realistic” form of Cournot’s analysis.

**Cournot: Paper Money regulation as a matter of “bon sense”**

Cournot’s monetary theory is not to be found in his first and most known work from 1838 (Cournot, 2001 [1838]). This well known piece is his main contribution to a mathematical price theory. But, even there, some important points are made about money. In the chapters on “absolute value” (chapter 2) and “exchange rate” (chapter 3) we found the cornerstone of Cournot’s theory of the nature of money as a human institution necessary to the progress of human industry. After that general considerations, Cournot studies the determination of the price of metallic money though an algebraic exposition of the well known theories of reflux and “gold points”. At the end of Chapter 3 he remits the reader to Adam’s Smith work on exchange rate and metallic money price. This is not sufficient to found a complete and original monetary theory.

It is not needed thus to be said that Cournot’s monetary has been almost completely neglected compared to his price theory. The only reference to its monetary theory is made by Loiseau (1913). In his doctoral dissertation this author recognizes the main importance given by Cournot to the study of money but in particular to the analysis of credit and the banking system as a natural, necessary and critical evolution of the “industrial” system. This is my starting point.
1.6. From a static price theoretical framework towards a long-term institutionalist dynamic analysis: Cournot’s economic works from 1838 to 1877

The real interesting and original analysis on monetary matters by Cournot are presented in his two last economic works (Cournot, 1863) and (Cournot, 1982 [1877]). It is interesting to note an intellectual history aspect of this. These two pieces are completely free from the mathematical language of the first one. In the preface of both works Cournot explains that he is trying to catch the attention of a larger public, given the very limited success of his first book, he attributes to the mathematical language. However, another reason explaining the absence of mathematics from the last two works is given by Cournot in a letter to Walras published by Etienne Antonelli in *Econometrica* (Cournot, Walras, & Jevons, 1935, págs. 119-120). Cournot describes his physical incapacity to read and write mathematics because of a very hard vision trouble forcing him to use a reader boy since the 1830’s.

This remark is not worthless for our purpose because it allows explaining not only why Cournot tries to rewrite in a non-mathematical language his economic theory but because it explains the great difference concerning the subjects Cournot’s analyses in his last two works and the way he did it. These two works are as rigorous as his mathematical work. They take without significant change his main theoretical model of price determination from the 1838 book. However, those works also suggest a more mature intellectual production. The possibility to go further the mathematical language allows him to propose follow more complex and realistic argument. But the long period between the first and the second one (almost 30 years later) allowed him to rethink and most important to read a lot of new economics. This last element is more important considering his last work (1877) which has been written as a last theoretical statement with the confident sentiment of a triumph of his original idea of a mathematical and marginalist economic theory.

Those mature works present in particular a theory of long-term economic dynamics. This is the main difference related to the first one. In this dynamic context, Cournot develops an appraisal of the role of money in the
history of economic evolution. His views on money are thus determined by a historical conception. But this long term scope is also completed with very practical and contemporary debates. In particular, Cournot addressed the questions on free banking and on the regulation of non-metallic money. From the long-term historical point of view Cournot presents the evolution of human economy from a primitive rural economy towards the industrialized one. Money or, better said, the means of payments system, naturally evolves from a very simple one, allowing few trades among agricultural almost autarkic units towards a very complex financial system and fiat-money.

Let’s put it briefly (...), first let’s recognize that the notion of exchange of one material object against another material object (...) is a very concrete one. But the function of a numéraire or of coinage leads, by virtue of language and by the impulse of human mind, to consider an idea of value that is at a higher level from the point of view of mental abstraction, in a stronger relation with human reason and law. It seems very simple to understand that the peoples at the origin of arts, sciences and jurisprudence have also been at the origin of the institution of money within the economic system (Cournot A., 1982 [1877], pág. 89)²⁴

Cournot’s thought on the nature of money is well summarized in this quotation. His is an institutionalist view of the origin and evolution of money. If he recognizes that every single rural economy provided they realize even a few trades need to use a common standard of value and that this role is naturally given to a particular commodity, he also conceives the economic transformations and progress of societies needed the development of credit, metallic money and paper money. Those are creatures of the human mind not of nature. The abstract character of paper money and financial instruments is the pinnacle of this institutional development. These elements are initially introduced by a profit maximizing action of some agents, but they need of public powers to stabilize themselves and to work properly. This is the theoretical background for Cournt’s analysis of paper money. A very different one compared to Walras’s theory of the nature of money produced in order to complete his pure theoretical system.

²⁴ My translation.


1.7. Cournot and the natural propensity towards a fiat money system

It is now clear that Cournot conceived paper money as part of an ongoing evolution of the payment system. However, this evolution is not a straight monotonic line of permanent and positive progress. On the contrary, the raise and evolution of paper money is a source of some evil. In particular when the political power abuses of it. Cournot, in a very equilibrated and realistic way, presents the origin of paper money as a result of the natural needs of a society whose population and wealth is increasing. This is a characteristic of industrial societies not of the rural stationary ones. Technological development, capital accumulation and division of labor are the basement of economic growth. Those elements cannot flourish within a pure metallic monetary system. The reason is quit paradoxically. Metallic money was historically adopted because of his natural stability and stable supply. However, the “needs of circulation” of industrial societies are ever changing. Crisis and booms are strongly tied to industry. Agricultural societies are exposed to climatic change, but industry is exposed to human creativity (op. cit. p. 43).

Following Cournot, the stability of a monetary standard is as chimerical as the stationary state of an industrial society. For this reason, an institutional agreement on an “artificial” standard of value is compulsory to the industrial progress:

Once one has admitted that metallic money is not a fixed standard of value, that it is exposed to real fluctuations, not only on his relative purchase power but on its own absolute value, it is a natural thing that men conceived the idea of a money of account in order to deal with the alterations on the value of precious metals. (...) So doing, men have not acted in a metaphysical way (...)
The instauration of a money of account, as reasonable and fair as it seems when its goal is to better the conditions of measuring values avoiding the variations of the value of metals (...), becomes an harmful institution, a source of trouble for the ideas and human conscience, (...) (Cournot A., 1982 [1877], pág. 68)

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25 Cournot uses the word “argent” (silver and money in French) in order to designate any form of metallic money (1982 [1877], pág. 67).
Cournot conceives the use of money as a source to finance government expenses, as in war times, and the abuse of political power is the drawback effect of the positive progress related to non-metallic money. This is a common trait of his general views on money and monetary regulation: a permanent oscillation between good and evil, between crises and prosperous periods. This is the spirit of a discretionary regulation of the monetary system by the State provided it is made within reasonable limits.

1.8. Banks, Paper-money and Monetary Policy: three necessary evils

When the story told by Cournot about the evolution of payment systems arrives to the point of the consolidation and spread of paper money, the same moderate standpoint dominates his arguments. Paper-money is a necessity but its value is unstable. Government intervention is needed in order to set up a common standard value and to regulate its production. Banks provide credit instruments and so doing create paper money of generally accepted. It is because it is necessary for the economy that paper money becomes not only a substitute for metallic money but an integral part of money supply. Cournot stands on a very different position than Walras: paper-money is not only impossible to differentiate from metallic money for the common sense but also from a pure theoretical point of view. Trying to establish a difference is going against the very nature of the payment system: a necessary device for the well functioning of an industrial economy.

(...)

money is money, a sui generis thing, and it is no more a bill of exchange than a commodity, but it has some affinities with both. (Cournot A., 1982 [1877], págs. 89-90)

The way the government ought to regulate the functioning of the monetary system depends on the particular circumstances. Banks lend money and create paper money according to a necessity. Walras could agree so far with Cournot. However, Cournot considers that this is a source of growth and of progress. But this must be handled very carefully. Cournot argument is condensed in the following quotation:
With good judgment and wisdom on the administration of paper-money issue, always harmonizing as possible the quantity according to the real circulation needs, Government can balance the things in order to maintain more or less stability of the price of paper money: provided that, on its side, the population keeps their natural common sense from the excess of either panic or infatuation. (Cournot A. , 1863, pp. 263-264)

It is interesting to note that Cournot refers to inconvertible and legal-tender paper money issued by a monopoly bank (i.e. Bank of France). We the usual warnings, he considers that there exist some limits within which inconvertible paper-money does not harm the economy provided a fine dose of common sense (bon sense) of both Government and private agents. Cournot does not provide exact formulas for the bon-sense of monetary policy. He considers intuition and observation of the ongoing situation of the economy are more accurate than sophisticate mathematical theories.

1.9. Inconvertible Paper-Money vs. pure metallic money

Cournot introduces a similar argument to the one Walras’s uses to explain the consequences of an exaggerated supply of paper money. This argument is based on the well known mechanism of of gold price as a regulator of metallic money price:

The Bank can make use of this power to stimulate, to increase general production or the movement of enterprises and business, as far as a shrink on the value of money (either metallic or paper), and as far as to trigger a commercial crisis if the movement it produces is too abrupt. To say that bank notes, issued beyond the circulation real needs, will come back to the bank in order to redeem them, is to suppose the public confidence has already been demolished. Otherwise, why taking paper money back to the bank rather than buying metallic money? (Cournot A. , 1863, p. 253)

Contrary to Walras, Cournot states the possibility of good consequences of the increase in paper money supply within the limits of public confidence. He conveys modification of money supply will destabilize nominal prices and thus the purchasing power of money. However, he also recognize that it is impossible, under the actual conditions of technology and economic knowledge, to implement a better monetary system.
Cournot refers to a bimetallic system, very similar to the one imagined by Walras, and arrives to the conclusion that it is for sure an ideal system, as a philosophical matter, but:

The double metallic standard is the less easy to handle for any Government, because it implies the difficult task of permanent screening and correction of gold and silver prices and frequently modifications the official rates as soon as it becomes far enough from commercial rates. How could the Government accept the enrichment of a speculator on the harmful consequence for the Country (...)? And How could the Government impose to his people the obligation of receiving a commercially devaluated value as their payments? (Cournot A., 1982 [1877], pág. 80)

The permanent threat of speculators is a reality as well for the metallic money as for the paper-money. The implementation of a stable monetary standard is a main concern, but a pure metallic system implies a too hard task and too strict policies. It is, from this practical point of view, an undesirable system.

Governments have other mechanisms in order to maintain as stable as possible the circulation of paper money. Legal tender is one and Cournot also considers the importance of taxation and public expenses as one of the main forms to assure paper money circulation. Under difficult economic or political conditions, Government takes the reasonable decision to stop convertibility. How could it be possible to avoid panic and a confidence crisis on paper money? The answer is to maintain a stable demand for it. Legal tender is an acceptable policy when panic or any unreasonable psychological reason is at the origin of a depreciation of convertible paper-money. Cournot is extremely clear on this matter:

A trouble, a suspension of convertibility from the Bank, shall be a cause of depreciation of bank notes. And as it is impossible to distinguish the limits between those psychological phenomena named fright and panic, the depreciation could goes to the complete failure of fiat money, if government did not have the possibility to take one of these two measures: one consisting on accepting them as tax payments at its nominal price, the other consisting on compelling legal tender for bank notes at their entire nominal value. This last solution is by far more adequate in order to allow fast and smooth overtaking of a crisis: because for every agent the liabilities and payments are taking at the same nominal value. (Cournot A., 1982 [1877], pág. 76)
The economic rationale for legal-tender policies is clear: stability of the contracts is assured by a common restriction affecting debtors and lenders in the same way. The imposition of the payment of taxes and public fees in paper money is another possibility to support paper money circulation but Cournot also acknowledges that this is a dangerous policy because it opens the door to Government manipulation. In any case, Cournot recognizes and economically justifies monetary policies that Walras would reject because they are a dangerous threat for the commutative justice of a market economy. Cournot considers monetary policy as a service public (1863, p. 200), needing to be ruled with caution but also discretionary.

**Concluding remarks: Walras, Cournot and the currency school vs banking school debate**

These two important theoreticians produced very original reflexions on monetary matters compare the main concerns of monetary debates of their time. The historical and intellectual context to which belong Walras’s and Cournot’s monetary analyses were dominated by the banking vs. currency schools debate on central banks, on the one hand, and by the free banking vs. central bank divide on the other. These two debates had common points and they were related to theoretical views on money. The central issue at stake in both debates was the definition of money and if paper money and credit instruments could be considered as part of that definition or if only metallic currency could. Most of the arguments were given in terms of liquidity or solvability risk of fiat monetary forms.

Walras’s monetary policy is not easy to classified using those debates as criterion. We can say that Walras is opposed to both free banking and central banking. He is in fact opposed to monetary creation by banks. He acknowledges the importance of financial developments, of stock markets and credit. However he considers those developments a permanent source of danger for the stability of a perfect competitive general equilibrium system. His opposition is not based on a simple denial of the central role of banks in a dynamic economy but on the possibility to let the banks, guided by their well founded self-interest, to disturb economic prices. This argument is based on a very interventionist conclusion: the natural function of a free financial and credit market is dangerous for a market economy. The financial system must be strictly regulated and the system of
payments must be kept of financial fluctuations. His quasi bimetallic system is based on strict rules and permanent intervention of the State in order to assure the distinction between finance and credit on the one hand and money on the other hand. Monetary circulation needs to be a neutral device of the economic system.

The walrasian point may not be understood as Currency School principle. Walras proposition is much more extreme and the only similar idea that we can find in Irving Fisher's 100% Money (Fisher, 1997 [1935]). According to this proposition banks became simple mediators between real production and savings (Diatkine, 2002, pág. 151). This is the exactly the theoretical explanation of the significance of Walras's proposition. I have tried to show that it tries to avoid a difference between the theoretical role of banks at work in the EEPP and the real role of them. From the pure economics point of view, Walras presents banks as simple deposit banks not creating any new form of currency other than a mechanical transfer of monetized savings into monetary capital borrowed by entrepreneurs. But, when his applied theory considers banks, he is forced to recognize the capacity of banks, as entrepreneurs, to create new forms of currency. This is a source of perturbation and instability. This is what Walras is trying to avoid.

Cournot develops very realistic and midway appreciations on the financial developments of his time. He did not present banks or credit or finance as a danger but as consequence of progress. However, paper-money and banking could be a source of instability: a necessary evil. Cournot did not analyze the case of free-banking, he was always taking as given the existence of a Bank, a central Bank. He warned about the risks of this monopoly but never proposed to eliminate the monopoly but to keep its functioning reasonable limits. He compares the Bank of France with the Bank of England on the handling of crisis and the instauration of legal-tender. He concludes the latter was better managing because legal tender was imposing with good timing and retired when necessary, whether the Bank of France was permanently exposed to the arbitrary influence of Government and legal tender was an instrument to abuse of it.
This makes very difficult to put Cournot’s monetary thinking on one side or another. He did not develop an argument “100%” in favor of metallic money, but he considered metallic money having good stability provided paper-money acts as a complement. Any form of credit, fiat money or financial innovation is regarded by Cournot as related to the ever increasing necessities of industrial societies. His long-term views on the historical evolution of economic systems allows him to present those elements at the same level as arts, literature, technology, etc...

Cournot always considered practical solutions. Easy to implement and always trying to avoid the temptation of too complicated “scientific” propositions on monetary matters. Those “philosophical utopia will always be overtaken by reality” he ponders (Cournot A., 1863, p. 246). This could be his message to Walras.
References


