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To cite this article: Pablo Paniagua (2018): Money and the emergence of knowledge in society, Review of Social Economy, DOI: [10.1080/00346764.2017.1423511](https://doi.org/10.1080/00346764.2017.1423511)

To link to this article: <https://doi.org/10.1080/00346764.2017.1423511>



Published online: 05 Jan 2018.



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# Money and the emergence of knowledge in society

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## ABSTRACT

This paper deals with money's epistemic relevance in society. Money presents theoretical difficulties for neoclassical economics, which treats it as a cost-reducing tool, leading to a socially neutral, aseptic view on money. Drawing from complexity and social theory I provide a socio-epistemic rationalization for money's irreplaceable role. Building upon Ingham's *Money Is a Social Relation*, I argue that money generates a new orderly system of complex social relations that in turn engenders knowledge as an emergent social and ontological phenomenon irreducible to the fragmented knowledge held by members of society. I show that ultimately money cannot be separated from economic knowledge and market rationality. This paper provides sociological and ontological accounts for the emergence of knowledge crucial to coordinate societies, thus extending recent explorations of the ontology of money.

**ARTICLE HISTORY** Received 22 December 2016; Accepted 17 November 2017

**KEYWORDS** Money; social relations; systems theory; social ontology; emergence

**JEL CLASSIFICATIONS** B25; D80; E02

## 1. Introduction

The benefits of the commercial world would be unlikely without the use of money in exchanges. As Simmel ([1907] 1978) acknowledged, money is the essence of commercial modernity and social complexity. Weber (1978) also hinted at the crucial epistemic role of money in individuals' market cognition and in enabling rational calculation, opening the path for exploring the relationship between money and knowledge. Despite the contributions of Simmel and Weber, not much else has been written in exploring the relationship between social complexity, money, and knowledge (Horwitz 1992).

Economists recognize that the fundamental 'coordination problem' that societies face in promoting a rational economic order stems from operationalizing and organizing the fragmented and tacit nature of a vast portion of the relevant

knowledge required for social coordination (Hayek 1945; Weber 1978). The so-called coordination problem is fundamentally an informational, epistemic and communicational problem at the social level (Clower 1984). It concerns how society can accurately create, mobilize, and operationalize hard-to-codify knowledge that is relevant for market decision-making (Lavoie 1985). Hayek (1945) identified disequilibrium market prices as indispensable epistemic signals mechanisms (or knowledge surrogates) to 'alleviate' the 'coordination problem' and operationalize and disseminate the knowledge available in society. Hayek added an emphasis on how prices and markets can allow us to communicate or operationalize existent fragmented contextual bits of knowledge dispersed among minds (Hayek 1945). Nevertheless, not much contemporary literature builds on Hayek to focus on two crucial epistemic and ontological issues and gaps related to money and markets.

First, how market knowledge develops in society and can be said to actually exist in a communicable and comprehensible manner has been under-explored (Horwitz 1992). Further unexplored are the necessary *institutional conditions* under which unrelated fragmented bits of economic knowledge can be first contextually formed and held in individuals' minds, and later used, arranged and operationalized by society in a complex and organized manner that obtains a wealth-enhancing higher order (emergent) type of knowledge that possesses ontological and qualitatively distinct properties. And second, there is a gap in the literature in evaluating whether that crucial emergent knowledge seen in markets can be in principle ontologically reducible to the linear combination, mobilization, or simple aggregation of the individuals' previously unrelated and unorganized bits of knowledge – and therefore simply explained or replicated by knowledge aggregation and linear (simpler) mobilization.

I address these gaps in the literature by arguing: first in Section 4, that market knowledge – similar to scientific knowledge – is a system of social monetary relations in context, and is institutionally contextual and socio-relational. Second – by borrowing from complex orders and systems theory in Section 5 – the paper also shows that economic knowledge is inexplicable by and irreducible to the mere communication and interpretation of tacit knowledge within individuals' minds *prior* to the orderly process of exchange (see Horwitz 1992). Section 5 then contributes to the ontology of money by showing that if economic knowledge has properties different than – and is ontologically irreducible to – the pieces that had originally formed the order, then money and exchanges *cannot* simply be said to play a conveyance or communicational role. This important socio-epistemic role of money in moving beyond knowledge conveyance towards the *generation* and *transformation* of complex knowledge is a relevant argument that the literature has not yet emphasized. My title then echoes Hayek's (1945) paper on knowledge, but I seek to enlarge his somewhat narrow epistemic view into the social interactive

aspects of knowledge, with a perspective on complexity and systems theory and the social ontology of money. Thus this paper aims at providing a systems-theory conception for the emergence of crucial epistemic resources in markets, that have been thus far inaccurately considered or assumed to be explicable by (or at least easily reducible to) the unstructured aggregation, gathering or communication of *already* existent bits of knowledge held in individual minds. The use of money in society then sustains and enlarges a relational and epistemological ecosystem that relates, combines and ontologically transforms our personal knowledge into epistemic wholes, more complex and socially useful.

## 2. Some relevant aspects of money

This paper, building on Lawson (2012, 2016), Ingham (1996a, 2000), and Horwitz (1992), argues that money's crucial role in the economy is an epistemological and ontological one that has not been totally explored. And it resides in money's ubiquitousness and unique capacity to generate and sustain a new and vast system of orderly social relations that (constantly) brings novel and ever-changing ontological transformations and complex properties of market emergence – emergent properties that would have never existed without money as the medium to relate (and exchange); and as the socio-relational system that sustains and arranges – in specific manners – the bits of local disseminated knowledge, obtaining qualitatively distinct and ontologically diverse properties.

For the purposes of this paper, money in modern capitalistic economies today is *socially constructed* and broadly represented by liabilities (complex systems of debt relations) in the form of both bank currency (banknotes) and bank deposits issued by commercial banks (Laidler 1990, Smithin 2000). Thus both types of bank liabilities together comprise money as a system of debt relations and as the generalized means of exchange in markets (further see Section 5.2). The sum of both banknotes held by the public and commercial bank deposits then broadly represents money as liabilities and debt relations (Laidler 1990).

Banknotes, which in most societies today means central bank notes, are debt relations with respect to the state or the legitimately sanctioned 'monetary authority' that issues notes as central banks' liabilities. Banknotes are socially constructed debt categories in which the social relation acquires the form of a promise to pay by the state (Ingham 2000). This socially constructed debt category 'is constituted by social relations between the monetary [state-based authority] and other economic agencies in the society' – this is a type of 'state money' in which 'the liabilities of state central banks acquire the status of *valuata* money or base money' (Smithin 2000: 7). In addition, bank deposits as liabilities are money as debt relations

produced by commercial banks and arise from bank credit. Bank deposits are generated through commercial banks' debt relationships and nowadays these liabilities ultimately provide most of society's means of exchange. Therefore, the overall money supply in the economy primarily consists of commercial bank deposits rather than (but in addition to) banknotes – even though both of them represent money as debt relations in one form or another (Laidler 1990: 33; Smithin 2000). Hence modern capitalistic money 'now consists in nothing more than a symbol or signifier of states' and banks' promises to pay' (Ingham 2000: 23). Accordingly, both bank deposits and banknotes are debt relations (conceived of as money) and thus both are extremely important in sustaining and enlarging the orderly system of monetary exchanges that generates the ontological transformation of knowledge I discuss here.

This paper considers money as

credit money, in which special signifiers of debt (promises to pay) issued by states and banks, become means of payment ... capitalistic credit money is a qualitatively distinct form in which money-stuff itself is essentially the social relation of the promise to pay. (Ingham 2000: 18–19)

Thus money in the form of modern capitalistic 'credit money' – as Simmel ([1907] 1978: 177) foresaw – is *not* simply a veil over economic exchanges. Instead, it socially and qualitatively transforms the pure (or barter) exchange relations into 'structurally distinct [monetary and debt] social relations' (Ingham 2000: 23). Money as a generally accepted means of exchange is not necessarily a single essential commodity that acquires special properties and is an end in itself, nor 'money-stuff' as commodity-objects (Ingham 2000). Its essence as the means of exchange is 'most usefully seen as a socially constructed (and continuously re-negotiated) category, and is constituted by social relations between the monetary and other economic agencies in the society' (Smithin 2000: 7). What makes money distinct from barter is not its physical properties or the nature of 'money-stuff' itself, but rather that it acquires a centrality in expressing coherently exchanges and debt relations, enabling a widespread homogenous system of monetary exchanges.

The focus here then is on the modern conception of money as capitalistic 'credit money', represented as a system of social and debt relations that creates widespread and recurrent systems of exchanges. The emphasis is on money's role as a means of exchange that establishes new intricate trade relations, generating 'higher order' economic knowledge. However, we must not disregard the 'actual social processes by which money is produced ... [and] that money of account is the pivotal element of monetary practice [of exchange and debt relations]' (Ingham 2000: 18).

Money's centrality in the economic order stems from the fact that virtually all exchanges and trades in markets take place through monetary means of exchange, which includes debt (deferred payment denominated in money of account), itself a social relation (Ingham 2000). Additionally, 'something which is merely being used as a convenient medium of exchange on the spot may approach to being money ... [but] Money-*Proper* in the full sense of the term can only exist in relation to a Money-of-Account' (Keynes 1930: 3).<sup>1</sup> Hence money as money of account, in addition to money as means of exchange, allows people to homogeneously and consistently define debts and market prices and to express them in a common numeric denominator, enabling comparisons of alternatives and the market values of goods and sustaining rational economic calculation (Weber 1978). It also provides a commonly agreed denominator (focal point) by which to widely trade goods and to engage in more complex and general debt relations without the use of the 'money-stuff' to immediate trades (Keynes 1930). Money of account then means a standard-reckoning form of money (Heinsohn and Steiger 2013). In other words, money of account 'is the *essential* means by which price lists are constructed and multilateral, inter-temporal exchange is made possible ... [T]he actual money-stuff is not required for the immediate transactions' (Ingham 2000: 18). Thus, as Clower recognized, 'Goods buy money, money buys goods – but goods do not buy goods in any organized market' (Clower 1984: 100). For these reasons, conventional base money (or *valuata*) and credit and debt relations – as means of exchange, sustained and enlarged by the money of account – touch and intermediate all socio-economic

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<sup>1</sup>It has been argued that throughout the evolution of monetary systems, the medium of exchange and unit of account coevolve (Horwitz 1992). Other scholars instead have argued that money's function as a medium of exchange derives from its function as a money of account (Smithin 2000). It is beyond the scope of this paper to contribute to that debate. I recognize *both* functions – independently of which one did in fact emerge first – as crucial to the epistemic and ontological role of money in sustaining complex systems of exchange and debt relations required to produce higher order knowledge. The main focus is on money's role as a means of exchange (including debt relations), which might suggest a secondary role to the unit of account. However, here I understand money, defined broadly as – and *developing* throughout – the money of account, to denominate and coordinate exchanges in all markets and by expressing and denominating debt and prices (Keynes 1930). Thus 'money of account is the pivotal element of monetary practice' (Ingham 2000: 18). That is the starting point for the emergence of an orderly social structure of complex monetary practices based on the development of an asset that constitutes the medium of final settlement (unambiguously united in the same asset with the unit of account) (Smithin 2000). From this, a multiplicity of generally accepted monetary media of exchange can arise, sustaining and enlarging the orderly exchange and social relations that produce the novel and complex knowledge stressed in this paper. Such new vital economic relations can rely on different forms of exchange media: the conventional base money (medium of final settlement) as means of exchange, and debt relations denominated in money of account (settled by or related to the ultimate means of payment) (Smithin 2000). Money then potentially evolves from money of account and it is then conceived in this paper as means of exchange sustained on and enlarged from money of account, thus it is not a particular asset, but rather different forms of social and debt relations. Thus money's crucial functions are not entirely separated. In this paper, both functions are crucial and closely related in the formation of both a broad an orderly exchange network of economic relations and a monetarily (in the sense of unit of account) expressed context for debts and prices that sustain monetary practices. Consequently, both functions are vital in enabling different aspects of the epistemic functions of money that sustain complex market phenomena.

exchanges and affect the form and extension of most socio-economic relations in markets.

Money, then, as means of exchange and money of account, acquires both a unique degree of social pervasiveness and an epistemic intertemporal organizing relevance, which allows it to sustain a widespread system of orderly, recurrent, homogenous in kind, and commonly expressed social interactions and extends complexity and the formation of higher order knowledge beyond what language or any other form of social relations could achieve. The crucial aspect of both functions is how they allow money to express and order economic reality, to organize debt relations, and to bring people together into new and more complex social interactive processes, producing intricate social configurations that are not designed by any of the agents forming them (Smithin 2000).

### **3. Social features of money and unexplored ontological properties**

As suggested in the previous section, the ontology of money and the application of systems theory, which considers the emergence of new and complex economic phenomena, or 'wholes,' through orderly social interactions, suggest that money could play an economic and complexity role far greater than (although containing) a communication process or a 'symbolic medium of social communication' (Ganssman 1988). Neoclassical economics, however, cannot grasp this complexity and ontological relevance of money because it cannot adequately conceptualize social structures, social relations, and the emergent properties generated from them (Ingham 1996b). Economics has been alas too narrowly focused on money as an individualistic 'efficiency tool' and a cost-reducing device that atomistic utility-maximizing agents use (Smithin 2000). Hence economists have disregarded the social and institutional context and the networks of interactions that agents form through using money, proscribing any considerations concerning social relations.

On the other hand, in the sociological literature on money there have been several other non-ontological and non-emergent social, power, and cultural properties of money highlighted that might seem *prima facie* relevant for the attempts of this paper to show money's unique socio-epistemic relevance. Some of the current non-economic (or indirectly economic) aspects concerning money and sociology treated in the literature are social and cultural issues concerning sharing and constructing symbolic relations and commercial meaning and codes about the world, money's emergence as a denominator and signal of financial wealth and its tensions, money's role in defining and signaling social

power and thus generating power issues within markets, and money's communicational signaling aspects (Heinsohn and Steiger 2013).<sup>2</sup>

Nevertheless, despite the literature's relevance on some social and cultural issues, this paper does not focus directly on these aspects since they do not address explicitly the ontology of money. Particularly, they do not address the vital relationship between specific institutional contexts, the formation of social relations, and the novel emergent market phenomena that might arise from them. Thus the aforementioned aspects of money are silent on how money organizes and arranges bits of scattered knowledge in non-linear manners that reach irreducible emergent totalities. This paper instead sheds light on the underdeveloped epistemology and complexity of money (Ingham 1998), thereby building a bridge between social theory and complexity theory. Money's economic uniqueness, I argue, stems from its role in organizing complexity and thus in allowing a more highly organized and complex phenomenon to arise from social relations helping to promote higher degrees of market rationality.

The recent sociological literature on money, building on Ingham, has focused on the 'social production' of money and how money is conceptualized as a 'system of social relations' (Ingham 1996a, 1998; Lawson 2016). However, there has been little attention to the ontological and epistemic implications that such a system of social relations could generate. I argue that money is ontologically *never* neutral in society, since it plays a unique social role in producing novel epistemic complexity. Its social *non-neutrality* then resides in allowing intricate social economic knowledge to emerge from social relations. Hence economic knowledge itself *is* a system of social relations.

#### 4. Institutions and the broadening of the 'Social Mind'

In exploring the specific connection between money and knowledge is also necessary to articulate the general relationship between institutions and individuals' 'contextual cognition,' in addition to the ontological implications of institutions in human relations (Lawson 1997). In other words, it is important to explore

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<sup>2</sup>Heinsohn and Steiger (2013) suggest that money plays a crucial role as a denominator of wealth and thus social power. Indeed, there are some social aspects of money aforementioned that are related with additional epistemic and social-signaling functions that actually contribute to the emergence of economic knowledge – particularly, the role of money as an epistemic aid in enabling the measuring of private wealth (and debt contracts) and thus the ascertaining and comparing of economic value. This helps promote intertemporal economic calculation and a rapid expansion of rational debt relations. Money plays a role in measuring wealth and debt, and thus it enables individuals to plan through time their actions and debt relations. In addition, there are potential power issues within markets that are associated with the production of money and private property and that might arise as consequences from the use (and production) of money and dispersed ownership (Ingham 2000). Private property is also intimately linked with decentralized trade and the capacity to exchange property and enact contracts, then with the emergence of money (and debt) (Heinsohn and Steiger 2013). However, this could also be associated with the existence of power issues *within* those same emergent totalities. Indeed, power issues and the form taken by wealth and social powers in markets might be intimately related with the use and production of money to establish social relations.

how (if at all) institutions affect how knowledge is created and eventually disseminated both at the individual and the social level (North 1994). Relating the concepts of knowledge, individuals' relations, and institutional contexts provides a view in which 'institutions lose their purely functional nature outside of the individual and become the expression of the capabilities of the mind, which are not innate but develop and are organized in connection with other individuals' (Rizzello and Turvani 2000: 177). Moreover, the literature on 'contextual cognition' and the 'growth of knowledge' provides further support for considering institutions and their rules – which govern social interactions – to have deep repercussions for the epistemic resources they generate (Boland 1979). It is important to note that institutions not only provide the limitations and rules for guiding action, but also provide the mechanisms and *means* of social interaction and the social frameworks in which experiences are shaped and cognition will ultimately operate. Through specifying the means of interaction and the form of relations, institutions could have a large and deep effect on the knowledge individuals produce through market relationships.

Institutions are commonly defined as the formal and informal rules that govern and guide human behavior (North 1994). Hence they are usually depicted mainly as affecting actions and determining the limits and incentives for rational choice. However, they can be also conceived as doing something much more relevant than imposing restrictions to decision-makers (Boland 1979). We need to move beyond the functionalist view of institutions, in which they simply improve individuals' utility, lower transaction costs or bind their actions. Agents are not only guided and bound by institutions in regards to their autonomy and plausible sets of actions. What their minds express, how their choices unfold, and how they think are largely influenced by the context of their experiences, the rules that define cognition, and their social settings (Rizzello 1999). Our cognitive processes are 'filtered through' the institutional context in which our cognitions operate and in which our minds interact with other minds (Gigerenzer 2008).

Institutions shape and define restrictions, the incentive structures and context in which individuals interact (North 1994). The institutional context matters for guiding and incentivizing the development of specific actions and social interactions and then producing wealth-enhancing social outcomes. The same principle and role of the institutional context in guiding action and collaboration also apply to cognition and mind–mind relationships (Boland 1979). By establishing rules and particular mechanisms of social relations, they determine and affect cognitive processes and the knowledge present in different institutional settings (Lavoie 1985). How institutions guide and provide the subsequent mechanisms of social relations also deeply *affects* the interaction and communication among the minds, significantly shaping the cognitive processes that occur not only at individual level, but also the epistemic resources formed as outcomes of society. Institutions then are 'social institutions', and by shaping

cognition and mind–mind relations, they have a profound role to play in social ontology and cognitive complexity (Ingham 1996b; Lawson 2016).

Seen in this light institutions enable novel interactions to emerge, shaping mental processes, and making complex epistemic social phenomena possible. Such novel phenomena arise from the unique interactions and communications among the minds present in those specific ‘institutional contexts’ (Hayek [1967] 2014). The ‘social intelligence’ then is a complex emergent outcome of a system of specific and recurrent processes of communication, acts of classification, and interactions among agents. Or in other words, is an ‘organizing social structure’ defined by a set of rules that guide our mind–mind relationships and shape the specific manner in which individuals are connected. The institutional context and rules define social interactions, particularly the interactions between minds, affecting not only material outcomes but also the ‘social intelligence’ developed under them. Similar to the mind–neuron structure, ‘social intelligence’ is produced as a higher order epistemic outcome, more complex than and irreducible to the unstructured aggregation or simple sum of minds involved and their properties in isolation (Lawson 2012). This suggests that institutions matter for producing ‘social intelligence,’ mainly through affecting the mechanisms in which minds will relate and the recurrent and orderly way in which individuals can connect in context.

Knowledge and coordination, much like money itself, ‘should be seen as having “social” [institutional] conditions of existence’ (Ingham 1996a: 509). Institutions could also maintain and enlarge the social order and allow processes of self-organized (rule-guided) responses and interactions among agents. Such rule-guided responses and social relations, could lead to the emergence of beneficial social properties unique and distinct from those held by the separate individuals and irreducible to their unrelated properties (Lewis and Wagner 2016). These new arising social phenomena stem from *specific* institutional contexts, possess novel ontological properties, and display an emergent order that possesses some unique undesigned regularities, and process-based ‘organized complexity’ (Hayek [1967] 2014).<sup>3</sup> This conditional emergent complexity that arises from particular sets of social relations *and* rules-based systems is what accentuates the underdeveloped ontological relationship between institutions and emergent knowledge. Knowledge, then, can be conceptualized as an emergent property indivisible from – and a direct outcome of – the specific rule-guided social processes by which we relate. The market and monetary practices therein then are not only mechanisms to mobilize (or bypass the need to obtain explicitly) existent fragmented knowledge, but an overlapping or nested set of monetary, legal, and property institutions that sustain a creative socio-relational

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<sup>3</sup>Organized complexity here means that the character of the structures showing it depends not only on the properties of the individual elements of which they are composed, and the relative frequency with which they occur, but also on the manner in which the individual elements are connected with each other. (Hayek [1975] 2014: 365)

process (dynamic epistemological ecosystem) and allow unintended epistemic complexity to emerge. Institutions therefore, similar to the mind, create epistemic ecosystems that *enlarge* our 'collective intelligence' by providing specific mechanisms for coherent and orderly social interactions, which could increase the amount of epistemic resources available.

#### **4.1. The growth of knowledge in science and markets**

The relationship between institutions and the emergence of knowledge is not limited to markets. In fact, Michael Polanyi, when he studied the sociology of scientific knowledge (Polanyi 1951), suggested, first, the crucial role of institutions, social rules and culture in providing the framework in which social processes can be generated, producing unintended beneficial outcomes and social relations that discover new knowledge. Second, he noted how that new knowledge can be generated exclusively from precise competitive and relational academic social contexts (allowing knowledge, beyond the individuals' capacities, to accumulate).

Following Polanyi's sociology of knowledge, the crucial epistemic and coordinative role I am suggesting to money and the relevance of its institutional framework appear to be just a special case of a more *generalized* ontological property of some institutions producing organized complexity (Lewis and Wagner 2016). Specifically, the role of institutional frameworks, and their ontological implications for knowledge, in which their rules allow the formation of complex epistemic systems by enlarging and sustaining rivalrous, routinely and orderly mutual adjustments, generating specific connections among agents and interactions among individuals (Lawson 2012). There is a general ontological property and crucial relationship between rules and institutions defining the manner and means of interacting, and the complexity and properties of outcomes which arise from them (Hayek [1967] 2014). Institutions are sets of rules that define, constrain and allow organisms to relate, communicate, and act according to some general and uniform principles by which more highly organized and complex phenomena can occur at the social level (Lawson 2012). This suggests that if individuals follow certain rules, procedures and use specific mediums for social relations, they can produce a definite order for the whole. Or what Polanyi denominated the spontaneous formation of a complex polycentric order produced by the multiple responses, mutual adjustments and relations of the individuals interacting (or competing) and responding to their respective institutional surroundings. Hence the social outcome generated by people's interactions under specific institutions is orderly and possesses new ontological properties (Lawson 2012).

Hence institutional settings define rules of behavior and the mechanisms of interactions, such as for example academic rivalry among scientific theories in science (Lavoie 1985). In such institutional context, academic interactions, the

contention of theories and scientific discussions could produce new knowledge and the discovery of new scientific theories (Polanyi 1951). This is a particular form of relational and social-based growth of scientific knowledge and the growth of theories that are *not* previously and entirely located in individuals' minds (and not fully located and reducible to sum of the scientists' separated consciousness) (Polanyi 1951). Therefore, those new scientific discoveries and theories that arise from such professional relations and academic contentions *cannot* be said to exist at all separated from the specific academic processes and context in which scientists interacted (Polanyi 1958).

The relationship among: institutions, cognitive processes, and the 'social mind' as a complex phenomenon that arises from such institutions and processes suggest that rationality and cognition are social processes not entirely separable from social interactions and institutions (Gigerenzer 2008; Weber 1978). Human rationality and cognition are social, contextual, and determined by the institutional setting that frame for our subsequent interactions. The same principle applies to market rationality and rational economic choice (Weber 1978). Hence the unique function of money and markets in enabling economically relevant and more complex knowledge to arise, is just a special case of those complex institutions–society–mind relationships that are *ubiquitous* in social orders such as the scientific community.

The key insight from Polanyi's sociology of scientific knowledge is that knowledge itself and its growth are emergent social phenomena (social transformations), or an emergent 'social structure' indivisible from societal processes, interactive ecologies, rivalrous relations among agents and specific institutions (Lavoie 1985). Therefore, a vast and relevant extension of knowledge *cannot* be meaningfully conceived as existent anterior to – and separate from – the unique institutional framework that provides the rules and mechanisms by which minds relate and interact. This indicates that the growth of knowledge possesses deep complex and ontological categories related to emergence and behaves more like an epistemic ecosystem (Lewis and Wagner 2016). This point has important implications since it suggests that knowledge is not only specific to the environment in which individuals engage in cognition. It is also *indivisible* from 'social networks,' social relations, procedures and mediums of interaction that individuals establish in a given context (Buchanan 1982). Thus 'the existence of emergent properties [such as knowledge] depends not only on the presence of particular agents but also on certain relations to one another' (Lewis and Wagner 2016: 10). Institutions *and* mediums of social relations are the unique *social bridge* between the limited individual mind and the higher order social intelligence existent in society.

Knowledge is not only 'personal,' but also socially dependent and highly sensitive to context. The creation and transformation of knowledge appears to be highly dependent upon how interactions are established and choices unfold within institutions. Its social form *cannot* be known *ex ante*, anterior to

and outside from the social processes in which it can be transformed and created (Buchanan 1982). Therefore, it is best understood as a particular complex 'whole' (or ecosystem) composed of a dynamic set of social relations (Lawson 2016). Thus a satisfactory analysis of the 'social mind' requires knowledge not only of the isolated parts but also of the relations in which those parts stand to each other and, therefore, of rules governing how the parts related and interact' (Lewis and Wagner 2016: 10). This institutionally relational dependent property of the development of knowledge appears to affect all social processes individuals are engaged in, producing social phenomena distinct from those possessed by individuals before those interactions ever took place (Lawson 2012). Like Polanyi's (1951) illustration of scientific discovery, the knowledge that stems from such a context would not exist and would remain undiscovered if scientists did not have the institutional setting with the freedom to pursue their projects and the academic competitive – but rule following – relations among them. Outside specific complex social systems of relations, like the 'free competitive scientific community', the 'epistemic whole' or 'social intelligence' would not be more (and would perhaps be even less) than the 'sum of its parts'.

In the *absence* of certain institutional structures and specific mediums of relations that allow us to connect in orderly manners to produce organized complexity (see footnote 4), knowledge is not only not institutionalized, but also *nonexistent* and hence impossible to use by society. Following this view, money is not only important (as the neoclassical framework argues) because it maximizes individuals' utilities and reduces informational problems (Clower 1984; Smithin 2000). It is also vital since it provides the *social context* or 'unique place' that shapes and determines our social interactions in the market and the specific assembly of our mind–mind relationships, producing complex social intelligence. Money enlarges the 'social mind' through expanding the set of possible regular and uniform relations by providing a mechanism by which elements can be recursively and systematically connected through debt and exchange relations. Thus it enriches the knowledge useable in society with a 'more highly organized phenomena' (Hayek [1964] 2014: 263), a phenomenon previously absent. It broadens the interactive dimension of the process of knowledge-creation, expanding the order and regularity of interactions beyond language. Thereby generating a type of knowledge that would have never been produced linguistically.

## 5. Money and knowledge as complex phenomena

The key to understanding the role of money in sustaining coordination and ameliorating the 'economic problem' resides in recognizing that a relevant portion of our knowledge is non-linguistically articulable and is institutionally dependent or contextual. Economic knowledge much like scientific knowledge reviewed in the previous section, is difficult to generate and largely depends upon the

institutions from which it springs (Lavoie 1985). Its existence, as suggested, is conditioned upon a set of institutional structures that encourage certain coherent social interactions.

The reason why money is indispensable in society is that it itself becomes a new system of intricate social relations and engenders through its use a wider system of previously nonexistent relationally organized patterns of interactions among individuals (Ingham 1996a; Lawson 2012). As such, it generates an 'organizing structure' or a wider social configuration with novel ontological properties (Lawson 2016). This institutional framework provides 'the place' where relevant complex knowledge is ultimately developed as the result of an epistemological ecosystem. The social development of market knowledge, much like in the scientific community explored previously, uses decentralized knowledge and arranges it – through monetary-social relations – into novel 'totalities' or ontologically more complex epistemic resources. In other words, there is a crucial ontological and complexity *difference* between knowledge arranged and structured through monetary relations and the knowledge disseminated and held in individuals' minds without them. Thus money allows novel knowledge to emerge and be expressed as the unintended social outcome of the system of social and debt relations intermediated, denominated and constituted by its (money's) widespread use. Such a role of money has largely remained unexplored in the literature (Gilbert 2005). Money is indispensable in a capitalistic society because it provides the social means and unique relational mechanisms of orderly exchange and debt relations by which we can develop relevant higher order knowledge – through complex unintended monetary arrangements – that could ameliorate the coordination problem. Moreover, through that system of social relations, we can get emergent unanticipated wealth-enhancing properties through those novel epistemic arrangements. Without the use of money to define and express prices, our debt and economic relations, to relationally organize our interactions in specific homogenous manners, and to sustain new coherent and regular methods of social relations, we would be *unable* to arrange and structure the disseminated knowledge in an organized but intricate way that develops new meaningful and complex market knowledge and emergent properties. Thus society would be incapable of supporting a sustainable rational economic order that possesses higher degrees of 'social intelligence'.

### **5.1. The distinction between means of exchange and means of payment**

Since Menger's (1992) theory on the spontaneous evolution of money to overcome the deficiencies of barter, there has been a rather asymmetrical focus on money as the medium of exchange. Menger maintained that money had only one function in markets, as the medium of exchange, establishing that money as the means of final payment was not a distinctive function (Ingham 2000). There

is still 'a tendency to use the two functions interchangeably, but the distinction is an important one that helps to distinguish different types of economic transaction' (Ingham 2000: 20).<sup>4</sup> In spot, small, and continuously operating trades, abstract purchasing power in the form of exchange money (as the means of payment) need not actually be held for a long period of time, and the actual 'money-stuff' of media of exchange is what intermediates exchanges. However, in modern economies most exchanges and economic transactions relevant for the ontological transformation and formation of intricate economic knowledge are not necessarily performed in spot transactions using the 'money-stuff' of actual media of exchange or *valuata* (the asset that constitutes the medium of settlement and payment) (Smithin 2000).

Indeed, currently, bank liabilities (a type of commercial debt relations), particularly in the form of bank deposits generated by commercial banks and arising from bank credit, are commonly and broadly conceived also as money (as debt relations). In addition, banknotes, which in most societies today means central bank notes, are money as debt relations with respect to the state or the 'monetary authority' that issues notes as central banks' liabilities. Money therefore not only refers to banknotes, but also refers to deposits arising from bank credit, and these bank-deposit liabilities actually provide nowadays most of the means of exchange used in markets (Laidler 1990; Smithin 2000). Hence the overall money supply in the economy, used to enable the broad, crucial, and orderly monetary market exchanges emphasized in this article, consists today largely of bank deposits and not only of banknotes (Laidler 1990); even though both of them are forms of money as debt relations and 'a symbol or signifier of states' and banks' promises to pay' (Ingham 2000: 23). Therefore, commercial bank deposits in addition to banknotes are a crucial type of bank liability (and money) and a part of the broad system of debt-social relations that sustains and extends the ontological transformation of economic knowledge through market exchanges. We need to recognize that what we conceive of today as the medium of exchange, which enables a widespread system of orderly and homogenous exchanges, constitutes forms of bank liabilities or debt relations (conceived of as money) that are not narrowly limited to banknotes – which in most modern societies are central bank notes – but also bank deposits. Nowadays these liabilities (debt relations) provide most of society's actual means of exchange (Laidler 1990).

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<sup>4</sup>An example of this difference is in dual currency systems of the earliest times, in which base-metal tokens were used as means of exchange in small and spot transactions. But precious-metal coinage was instead legally valid as means of payment to settle and exhaust debt relations (Ingham 2000: 15). In this case we can see how debt (deferred payment) relations are indeed means of exchange, but not a final means of payment. The focus then in this paper, is on money as a means of exchange (including debt relations) as they are the socio-relational mechanisms that are *required* to generate 'immediate transactions' and to sustain the 'extensive and complex monetary practice (as opposed to barter)', and that they can be generated *even* in the absence of a universally acceptable means of payment (Ingham 2000: 18).

Accordingly then, here the 'actual money-stuff is not required for the immediate transactions' (Ingham 2000: 18). Hence most modern exchanges and widespread socio-economic relations are sustained and performed through credit and debt relations – such as bank deposits alluded above – and not through the conventional 'money-stuff' which is usually used as the means of (final) payment. Thus 'money is uniquely specified, first, by being a measure of value/unit of account and, second, by the capacity to store abstract value in a universally accepted form that enables it to act as a means of payment' (Ingham 2000: 21).<sup>5</sup>

In modern capitalistic economies, money as the means of exchange can take different forms (multiplicity of media of exchange) and includes both spot trades, performed through conventional money (*valuata* or base money), bank liabilities in the form of bank deposits, and debt (or deferred payment in a final means of settlement), which is a social relation (Smithin 2000). Money, instead, as the (final) means of payment or settlement of debt is generally 'hierarchical in nature' and does not include all forms of debt relations (deferred payment) since – by their nature and definition – they cannot logically be an ultimate and final form of payment to settle and exhaust debts (Smithin 2000: 6). Even if there is a multiplicity of means of exchange, including debt as social relations, there must be an object or a unique (financial) asset that plays the role of the generalized medium of payment and settlement and helps in the final liquidation of debts and liabilities. Today, in modern capitalistic societies it is represented by specific *institutionally legitimate* signifiers of debt issued by states and banks (Ingham 2000).

In other words, 'even if there is a multiplicity of media of exchange in any given monetary system, there invariably seems to be a unique asset which constitutes the medium of (final) settlement' (Smithin 2000: 6). Therefore, money as the means of payment refers to a different type of economic transaction (and a narrower range of assets) that occurs to settle and extinguish promises to pay and to settle credit and debt relations. Additionally, the actual 'money-stuff' that comprises the means of (final) payment 'namely that by delivery of which debts contracts and price contracts are discharged ... can only exist in relation to a money of account' (Keynes 1930: 3). Money as means of payment then, as Keynes noticed, is hierarchical and differs from the different exchange media, insofar as it is only produced by legitimately sanctioned agencies, and it is uniquely related (and closely tied) with and defined through the unit of account (Ingham 2000: 32). This is also a type of different economic transaction that occurs at a

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<sup>5</sup>An asset can only be accepted in payment if it works as a good store of value. This allows money – as a store of abstract value – to be withheld from exchanges because of increased liquidity preferences. Liquidity preferences are informed by local interactions, by social conditions, and by the level of economic uncertainty in markets. Thus factors that determine liquidity preferences have a large interactive and social dimension, and they also play an epistemic signaling function. Monetary relations have a unique function in the formation of a higher order and ontologically distinct economic reality and in the emergence of market phenomena. Subsequently, those same emergent market conditions, constituted by monetary relations (and their inherent unpredictability), feed back into the decision-making level informing individuals about market conditions, influencing again liquidity preferences.

later date (probably in a different place) and after the immediate transaction and exchange relation performed through money as the means of exchange.

Wicksell ([1906] 1967: 17) defined the generalized medium of exchange as an asset not to be particularly used in consumption or production but ‘which is habitually, and without hesitation, taken [on its own account] by anybody in exchange for any commodity.’ Hence today, it could refer to any particular assets (or specific credit and debt contracts and relations) in the economy that are generally and habitually accepted as exchange medium, in exchange for goods and services or socioeconomic debt relations that *immediate* the process of exchange (Smithin 2000). In contrast, the notion of means of payment refers to an object (or asset) that can be used to ultimately pay for the purchases and to extinguish or settle (the final discharge of) any debt, a different type of economic transaction that occurs subsequent to the use of debt relations (such as bank deposits) or money as exchange media in initiating the exchange (Smithin 2000). And as such, it is here of a different order of relevance in the aspects of money that involve the enabling and enlargement of debt and exchange relations (and thus in the formation of complex market knowledge); since an extensive and complex system of monetary and debt practices and prices – that sustains the process of orderly socio-monetary relations that enlarges the ‘social intelligence’ – is possible without a universally acceptable means of payment (Ingham 2000: 18). Hence for the scope of this paper, I focus on and refer to money broadly conceived as the means of exchange and not to the means of payment, in the Wicksellian sense stated above – which includes in modern capitalistic economies conventional exchange media, liabilities in the form of bank deposits, ‘credit money’ and debt (deferred payment), a social relation – as the crucial (and necessary) – in addition to money of account – aspect of money in establishing an orderly and widespread social system of ‘complex monetary practices’ that have deep and unintended ontological and epistemic implications.

## **5.2. Orderly exchange relations and emergent irreducible totalities**

As it was suggested previously, money is able to accomplish an epistemic role through its pervasive capacity to mediate almost all market exchanges and unintentionally generate knowledge through them. Money’s function as a medium of exchange allows it to ‘touch,’ intermediate, and be part of all (or most) economic transactions (Clower 1984). Therefore, money is a pervasive and ubiquitous element in markets and all markets indirectly become markets for money (Yeager 1968). This allows all prices in the economy to become money prices and hence to convey the new emergent phenomena of knowledge in a homogenous form of symbolic communication. The fact that money mediates and symbolizes new social relations is hardly a new insight in sociology (Marx [1973] 1993). However, the emergent properties of ‘more highly organized’ complexity and the ontologically different epistemic phenomena that stem from

them, and how these properties ultimately relate to the ‘coordination problem,’ are crucial macroeconomic implications of the use of money not fully developed in the literature. This suggests that the ontology of money is actually inseparable from sociology and macroeconomics.

Money by becoming the generalized medium of exchange allows a single and homogenous process of expression and socialization of knowledge (Horwitz 1992). This allows a complex organized system to form (Lewis and Wagner 2016). Such a uniform, extensive and customary process of relations sustains and provides the base for a coherent form of repetitive widespread interactions among individuals, allowing a complex but orderly system to be formed (Hayek [1967] 2014, n.d.). Thus the pervasive use of money in exchanges allows individuals to transcend their personal cognitive and communicative limitations (Horwitz 1992). The cognitive task of developing knowledge and promoting economic progress moves away from individuals’ cognitive capacities, and becomes a social process in which money relations sustain the formation of knowledge. This process of extended cognition produces a type of knowledge that is more complex than the sum or communication of its parts.<sup>6</sup> The knowledge available is no longer the sum or aggregation of the fragments and epistemic resources of individuals taken separately, but rather is the emergent phenomenon of specific social relationships and nonlinguistic processes intermediated through money. Such higher order epistemic properties are qualitatively different from, and irreducible to, those that individuals could possess if isolated or outside the social context that money facilitates.

The most well-known – albeit often overlooked – role of money is its function as the ‘generally accepted medium of exchange’ (Yeager 1968). The pervasive property of money in being present or intermediating and in denominating (expressing) most of market interactions has strong implications for the formation of our social intelligence and hence on emergent coordination. Money is one side of (almost) every market interaction and most of debt relations are denominated in the unit of account. It is from this role and ubiquity in mediating all exchanges that money acquires large epistemic and social implications for coordination and shapes society in ways not frequently recognized. It is because of money’s essential relevance and pervasiveness in the economy, *both* as means of exchange to intermediate most trades and economic relations and as the unit of account to coordinate market exchanges and to homogeneously express debt relations and market prices, that all market interactions and exchanges are coordinated, performed, and expressed through it. Through that pervasiveness

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<sup>6</sup>An example of knowledge as complex phenomenon is the emergent property of the saleability of money. The knowledge concerning the unique saleableness or (near-)perfect liquidity of a certain good that will be used as money is a contextual and social characteristic that needs to be generated and is constituted through a network of path-dependent social interactions (Menger 1992). Such knowledge does not exist disseminated or anterior to the social interactions that specifically constitute it. Moreover, it cannot be considered as (nor ontologically reducible to) the outcome of redistributed or aggregated sum of existing tacit knowledge (Buchanan 1982).

in exchanges, and in help defining debt and prices (in addition to defining and developing the standardized means of final payment), money extends rational calculation and management of debt and wealth, and expands the range of homogenous and orderly interactions and complexity of economic contact between individuals beyond the limits of language and barter. The ubiquitousness, focal point to denominate debt and prices and pervasiveness of money (as means of exchange) to trade, are the foundations for its ability to generate a new orderly system of novel epistemic and social relations. Money ultimately forms a new system of social relations that promotes the constant rearrangement of an organizing structure of relevant knowledge, which is ontologically irreducible to the elements that form it.<sup>7</sup>

Money could be partially perceived as sustaining social cooperation by mediating a new complementary process of extra-linguistic social communication and a process of knowledge transmission (Horwitz 1992). Nonetheless, this is not to maintain 'that all that happens there, as far as social science is concerned, is communication' (Ganssmann 1988: 306). Framing money's social role merely as an extra-linguistic mechanism to communicate existent but fragmented (or tacit) knowledge oversimplifies and conceals money's deeper ontological role in determining coordinated outcomes as complex social phenomena. Money does play a role as a mechanism of extra-linguistic interaction (Ganssman 1988). However, its crucial role in coordination is better understood as the social organizing structure in which novel and orderly social relations are created, which further enhances the development of higher order complexity. Money is not solely the mechanism by which knowledge is conveyed, but the context in which further knowledge is generated as a complex phenomenon inseparable from its relational use. Focusing merely on money's extra-linguistic role as a means to mobilize hard-to-articulate knowledge underestimates its vital ontological function in generating different and complex arrangements. Money does more than just redistribute knowledge, it provides the institutional and socio-relational context underlying and the homogenous mechanisms (money of account and generalized exchange media) to sustain orderly exchange and debt interactions behind complex market relations that encourage the growth of knowledge as a system of organized complexity.

As suggested in the introduction, it is both the habitual use of money as generalized means of exchange in all processes of trade and market interactions and its use as the unit of account to express debt relations and prices that ultimately enables money's pervasiveness to establish new orderly, frequent,

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<sup>7</sup>In the words of Marx:

The whole of this movement appears as a social process ... [T]he totality of the process appears as an objective interrelation, which arises spontaneously from nature; arising, it is true, from the mutual influence of conscious individuals on one another, but neither located in their consciousness, nor subsumed under them as a whole. Their own collisions with one another produce an *alien* social power standing above them, produce their mutual interaction as a process and power independent of them. (Marx [1973] 1993: 196–197)

and homogenous processes of interactions and exchanges. From this wide and orderly monetary system of relations and through the means of money and debt relations performed and denominated in the money of account, society can generate a novel organizing structure or a coherent social order based on the disseminated and previously unrelated bits of knowledge (Hayek [1967] 2014). This unfolding network of organized social-monetary relations generates and constantly rearranges the disseminated bits of tacit economic knowledge into new social 'wholes' and specific assemblies or intricate structures of relevant knowledge that acquire ontological and new complexity properties not present in the pre-existent disseminated parts that constitutes it (Lawson 2016). In other words:

The emergent totalities of which individuals and things are organised as components are, *qua* organised systems, *irreducible* to the sum total of the elements that come to serve as components just because these totalities are constituted in part by the manner in which the components are arranged or relationally organised; the relational organisation too is an emergent. As a result, ontological reduction of any emergent totality to the pre-existing elements alone, considered apart from their being relationally organised, is proscribed. (Lawson 2016: 5)

It is ultimately money's pervasiveness as the generalized medium of exchange that enables it to function as the regular, uniform, and widespread mechanism for individuals to relate and interact in a specific way, enhancing complex phenomena (Hayek [1967] 2014). This establishes 'a coherent structure of causally connected ... parts' (Hayek n.d.: 4). Complex systems such as this display significant ontological and emergent properties (Hayek [1964] 2014; Lawson 2012). This suggests that money does not merely redistribute and communicate hard-to-articulate knowledge. It rather generates higher order knowledge as a conditioned and procedural social outcome from those 'coherent structures' and social relations that did not previously exist, and it is not commensurable or reducible to the sum of the separated knowledge held by individuals. Market characteristics of goods, their technological properties, their relative scarcities, value added in alternative uses and other economic knowledge crucial to impart rationality to markets can only arise and be *constituted* through specific recurrent patterns of social and mental (monetary intermediated) relations that are sustained through money exchanges and debt relations. Money does indeed utilize and incorporate contextual and tacit knowledge into the system of social relations (Horwitz 1992). But the social outcome is a structural or 'organizational system' that is far more complex than its constituent parts (Lawson 2016).

In other words, economic knowledge is not explicable by nor fully intrinsic and contained in ourselves and our consciousness, but possesses a crucial social structure and procedural relational aspect (Marx [1973] 1993). Hence it is not merely an unstructured aggregation or the outcome of a communicational process of scattered epistemic bits. Outside those specific relations enhanced by money, such an epistemic structure that sustains and coordinates markets

would be absent. If you take apart the epistemic pieces and detach the individuals who use money and comprise the relational monetary components of markets, and arrange them in an arbitrary fashion *without* money as the specific manner in which they relate; it is implausible that the causal power and ontological properties of the knowledge we produced under those monetary relations will re-emerge (Lawson 2012, 2016). The monetary social structure makes the difference for the rationality and the epistemic resources available. Therefore, ontologically and epistemologically money should never be considered neutral. The crucial role of money consists in becoming a novel system of social relations that encourages the assembly and constant rearrangement of knowledge.

Consequently, money prices do indeed play a signaling function. However, they do so through the expression of money prices as symbolic representations of the new epistemic relations. Prices then represent the ever-unfolding complex epistemic phenomena that stem from the myriad of interactions of our minds. Prices are signaling outcomes of market complexity. They symbolize in a numeric fashion the emergent and richer epistemic order, or the new ontological properties being generated through money's use and the continuous rearrangement of our mind–mind relations. Hence most of the economic knowledge required to sustain a rational order cannot be said to exist anterior to and dissociated from the processes of money-exchange relations. Economic knowledge is an ontological property of the actual use of money in society and is then *indivisible* from the system of social relations money and debt relations engender.

Separated acts of exchange performed through money might indeed allow participants to be somewhat able to transmit and articulate their tacit and subjective knowledge into the price system (Horwitz 1992). Nevertheless, when those transactions and relations form part of a homogenous and coherent network of social competitive relations (as under money), the interconnected whole will possess properties different from and greater than the sum of its parts (Hayek [1964] 2014).<sup>8</sup> The market knowledge formed through monetary interactions cannot be scaled back or reducible to the agents involved in producing it. In fact, it represents a *disjunction* between the micro and macro levels of analysis.

Economic knowledge is better conceptualized as a complex phenomenon and an exclusive emergent property of a structure of social relations sustained by the use of money. Its relationship with the knowledge disseminated and held by individuals' prior to the social interactions enabled by money is a *nonscalable* relationship and cannot be described by aggregation or conveyance. In sum, money and prices cannot be said to be social institutions that simply communicate and redistribute knowledge. This section has showed that knowledge not only possesses tacit, social and institutional properties as suggested in Section 4. But furthermore, the 'social production' of complex economic knowledge and

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<sup>8</sup>This does not suggest that money does not play a role in allowing individuals' knowledge to be 'captured' into the system of prices and to bring personal knowledge to a social use (Horwitz 1992).

the constant rearrangement of disseminated knowledge that produces 'collective market wisdom' and unprecedented market outcomes, are in themselves a complex organized system of monetary and debt social relations, indivisible from the properties of money explored.

## 6. Concluding remarks

This paper has explored a complexity theory and ontological rationalization to conceptualize money's unique social dimension and its exceptional impact on coordination through the generation of knowledge – aspects that have been neglected both by economists and sociologists. I suggested that prices signal such emergent complexity by becoming the new guiding signs for the subsequent adaptations of our personal economic plans. Money is a social institution that creates and constitutes a new system of social relations (systematically connected parts). Therefore, it generates knowledge as a complex relational phenomenon. The indivisible relationship between money and epistemic complexity suggests that prices are far more than the numerically codification or non-linguistic translation of tacit disseminated knowledge.

Systems theory suggests that an analogy for understanding money's most critical higher order role should not be limited to its similarities to language as a medium of communication (Horwitz 1992). The linguistic analogy should be complemented with the sociology of knowledge and the 'growth of knowledge' theory within the scientific community (Polanyi 1951). Money is what ultimately makes the social and epistemological advantages of the market possible. This paper showed that the use of money in society is invaluable if we desire to enhance social coordination, cooperation, and market rationality through the production and transformation of epistemic resources. We cannot deliberately move away from, or eradicate money from society and pretend that our social intelligence or collective wisdom will stand unscathed. Our social complexity and economic knowledge are fundamentally dependent upon money. Eradicating money would eliminate the only mechanism beside of language by which novel social relations are extended into wider realms of the social life, and thus would severely curtail our social intelligence. Without money, the higher order phenomena built upon our tacit knowledge, skills, and organized relations – which we call the market economy – would never exist.

Money plays a significant role in aiding not only the communication of hard-to-articulate knowledge, but also the emergence of complex cognitive resources that enlarge and sustain coordination *beyond* what individuals could have achieved separately, consciously or through language. Far from being irrelevant to economic decision-making, money becomes the medium of relations by which economic rationality and market knowledge can exist, making it indivisible from coordination, and macroeconomic outcomes. I argued that economic knowledge, which is vital for coordination (Hayek 1945), is in itself a

higher order outcome and constituted by a system of intricate social relations sustained by money. Economic knowledge is therefore a system of monetary relations. Money does more than merely sustain a process of interpreting and communicating what is held in our minds. By creating an orderly system of interactions, money allows for a constant assembly of knowledge, which generates further epistemic resources that are ontologically diverse and qualitatively distinct from the ones held by the agents. Money is vital to coordination since it is the generative mechanism that shapes market interrelations, affecting the structure of knowledge.

Societies unintentionally attain a new and wealth-enhancing form of social freedom and enhancement of our epistemic abilities beyond the possibilities we had prior to the use of money as system of social relations. Money therefore sustains a unique epistemological ecosystem through relating and combining our knowledge in non-linear manners, producing epistemological totalities unattainable outside the use of money. Institutions such as money might restrain freedom and our range of action. But paradoxically they also free us from our own individual cognitive limitations, enabling a new kind of social and intellectual-cooperative freedom and rationality to develop – what Polanyi (1951) denominated ‘public liberty.’ It is a unique social liberty that, when exercised through money, contributes to the formation of distinctive wealth-enhancing higher level social orders and therefore far from an insignificant ‘neutral’ symbolic ‘veil.’

## Acknowledgements

The author would like to thank Victoria Finn and two anonymous referees for constructive comments and suggestions that have greatly improved this paper. I thank also Harry David for editing assistance.

## Disclosure statement

No potential conflict of interest was reported by the author.

## Notes on contributor

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