

# Back to the Future: Lösch, Isard, and the Role of Money and Credit in the Space-Economy

David S. Bieri | August, 2016

Working Paper No. 16-04



WORKING PAPER

# Back to the Future: Lösch, Isard, and the Role of Money and Credit in the Space-Economy\*

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August 2016

## Abstract

The recent financial crisis has been a powerful reminder that the intersectoral flow of funds is also—always and everywhere—a local phenomenon with real effects. Yet, the contemporary canon of regional economic theory has enshrined the classical dichotomy, treating the spheres of money and production as analytically distinct. Consequently, the current literature has little to say about monetary phenomena and their spatial consequences. The widespread disengagement of regional scientists with respect to issues of money, credit and banking represents a radical break with the discipline’s intellectual origins over half a century ago. This chapter re-examines the monetary content of some of the foundational works in regional science. In particular, I argue that August Lösch and Walter Isard, the former a student of Joseph Schumpeter’s and the latter a student of Alvin Hansen’s, both represent important branches in the long lineage of 20<sup>th</sup> century continental and U.S. monetary thought, respectively. In doing so, this chapter also outlines key elements of a research agenda that reengages with regional aspects of money and credit, casting them as central pillars of a Lösch-Isard synthesis.

*Keywords:* Monetary theory, monetary-financial system, non-neutrality of money, geography of money and finance.

*JEL classification:* B20, E12, R30

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\*A version of this paper will appear in the forthcoming volume *Regional Research Frontiers: The Next Fifty Years*, edited by R. Jackson and P. Schaeffer, Advances in Spatial Science: Springer International. I thank the editors for their detailed comments and encouragement on previous versions of this chapter. I am indebted to Scott Campbell for rich discussions of the intellectual history of regional science which were critical to my understanding of the Lösch-Schumpeter connection. I am also grateful for input from seminar participants at West Virginia University’s Regional Research Institute and at Virginia Tech, and from session participants at the 2015 Regional Science Association International meetings (Portland, OR), the 2016 Association of American Geographers meetings (San Francisco, CA), and the 2016 History of Economic Society meetings (Durham, NC).

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“The geographic variations in interest rates are generally a mirror image of the spatial organization of the banking system and of regional differences in the economic structure of production.” – Lösch (1940c, p.26, author’s translation)

“It is invalid to take the position that price and monetary phenomena are merely surface manifestations and reflections of the more nearly basic and underlying relations and interactions of man with his physical environment. [...] Price systems and monetary institutions are in modern society an indispensable set of cultural tools, [...] which strongly shape the evolving organizational form and nature of man’s economic and social activities. [...] To understand and anticipate the interaction of these forces, a knowledge of resources [...], and a knowledge of price, exchange control and monetary mechanisms [...] are each indispensable.” – Isard (1956, p.6)

## 1 Introduction

The contemporary canon of regional economic theory has enshrined the ‘classical dichotomy’ in that it treats the spheres of money and production as analytically distinct. As such, regional theory upholds the neutrality of money in its most basic quantity-theory position that suggests it is only the absolute price level, not relative prices and interest rates, and hence real output, that is affected by changes in the quantity of money, broadly conceived.<sup>1</sup> Regional researchers thus treat the monetary-financial system as the proverbial veil that renders money and financial interrelations a source for short-term frictions at best, but not relevant to the determination of regional market (dis)equilibria. Put differently, the dominant analytical approaches of mainstream regional economics exclusively focus on the real phenomena of a spatial barter economy in which money plays but a perfunctory role. In short, real factors determine real regional variables.<sup>2</sup>

Contrary to this view, I argue that the continued separation of monetary theory from price theory in regional thought represents a radical departure from the intellectual origins of the field of regional science, which has its roots in the pioneering work of August Lösch (1906–1945) and Walter Isard (1919–2010). In combining key elements of interregional trade theory and location theory, both Lösch’s and Isard’s treatment of monetary aspects of the ‘space-economy’ give rise to a *spatialized interpretation of the non-neutrality of money*—an area of research that has gained significant relevance once again in light of recent economic events.<sup>3</sup> Indeed, the disparate regional impacts of the financial dislocations during the crisis were a powerful

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<sup>1</sup>See Patinkin and Steiger (1989) and Klausinger (1990) for complementary overviews on the origins of the term ‘neutrality of money’.

<sup>2</sup>The recent attempts to infuse location theory with monetary analysis in Figueiredo and Crocco (2008) and in Nogueira, Crocco, Figueiredo, and Diniz (2015) represent remarkable exceptions in the otherwise languishing literature on money and its role in regional development. See Dow (1987) and Bieri and Schaeffer (2015) for comprehensive surveys of the literature on the treatment of money in regional economics.

<sup>3</sup>Isard first introduces the expression ‘space-economy’ in his *QJE* (1949) survey article wherein he defines the term as “concern[ing] itself with the local distribution of factors and resources as well as with local variations in prices, and thus with the immobilities and spatial inelasticities of factors and goods” (p. 478). Isard’s usage of the term is clearly inspired by its German origin as *Raumwirtschaft* (cf. Weigmann, 1931). While it has never found wide

reminder that the intersectoral flow of funds—always and everywhere—constitutes a local phenomenon with real effects across space.<sup>4</sup> In many ways, the muted post-crisis responses of monetary aggregates to the large-scale unconventional monetary policy experiments can be interpreted as long-overdue vindication of the critics of the quantity theory (cf. [Minsky, 1993](#); [Marcuzzo, 2002](#)).

In a renewed engagement with regional aspects of money and credit, this chapter re-examines the monetary content in the foundational works of August Lösch and Walter Isard. The former a student of Joseph Schumpeter's and the latter a student of Alvin Hansen's, both Lösch and Isard represent important branches in the long lineage of 20<sup>th</sup> century Continental and U.S. monetary thought, respectively. For our purposes here, we pay particular attention to [Lösch's \(1940a,b,c,d, 1944, 1949\)](#) analysis of the spatial consequences of monetary-financial arrangements on the one hand and [Isard's \(1956, 1960\)](#) exploratory work on the flow of funds across space on the other hand. Above all, with regard to the view that there are important, neglected contributions in Lösch's and Isard's work far beyond their ordinarily acknowledged influence on location theory, this chapter echoes [Ponsard \(2007\)](#) in suggesting that both are “famous, but ignored economists”.

Overall, then, this chapter has two closely related ambitions. First, it aims to document how the monetary content of August Lösch's and Walter Isard's spatial system completely disappeared from regional analysis. In fact, regional theorizing without money has its origins in the microfoundations-equilibrium transformation of the main corpus of orthodox economic theory, which now provides most of the epistemological and methodological underpinnings of contemporary regional science. Following [Storper's \(2013\)](#) terminology, I will refer to this dominant perspective in regional science as ‘new neoclassical urban economics’ (NNUE) whereby spatial heterogeneity of economic activity exclusively emerges from the optimal location choices of atomistic, representative agents (households, firms) and their respective interaction with the economies of agglomeration in equilibrium. As such, regional scientists' increasingly anaemic engagement with monetary issues during the discipline's first half-century is but a direct consequence of the axiomatic embedding of the neutrality of money in the NNUE framework. In the sense of [Schumpeter's \(1954\)](#) distinction between *real analysis* and *monetary analysis*, regional science today has thus completely turned its back on the latter, solely relying on the former apropos the assumption that the region as an exchange economy is fully described in terms of goods and services, and not monetary relations.

The second goal of this chapter is then to argue for the renewed importance of monetary analysis in regional science, placing the element of money “on the very ground floor of our analytic structure, abandoning the idea that all essential features of economic life can be represented by a barter-economy model” ([Schumpeter, 1954](#), p.278). In particular, I will outline a specific way for achieving this aim by re-

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adoption in regional science beyond Isard, a variety of economic geographers with a political economy perspective continue to use the expression (e.g. [Sheppard and Barnes, 1990](#); [Martin, 1999](#)).

<sup>4</sup>As an example of renewed interest in regional aspects of monetary phenomena, the literature on differences in regional price level dynamics has attracted significant new interest in the wake of the crisis. See, e.g., [Del Negro and Otrok \(2007\)](#); [Beckworth \(2010\)](#); [Fielding and Shields \(2011\)](#); [Beraja, Fuster, Hurst, and Vavra \(2015\)](#).

considering the contemporary relevance of the Lösch-Isard approach to *interregional stock-flow analysis*—a key research program that once defined the core of the field (Isard, 2004). As part of this argument, I contend that the intellectual roads not travelled in this regard hold the key to a promising research agenda in regional science.

The balance of this chapter is organised as follows. Section 2 sets the scene by retracing key intellectual developments that have induced ‘monetary amnesia’ in regional science. In section 3, I present a brief genealogy of monetary thought in regional science, ascribing the central views on money, credit and banking in the work of Lösch and Isard to the monetary traditions of Schumpeter and Hansen. Section 4 presents elements of a future research agenda that reengages with regional aspects of money and credit, casting them as central pillars of a Lösch-Isard synthesis. Section 5 offers some concluding thoughts.

## 2 Crisis? What crisis?

Propelled by his own gargantuan effort of transdisciplinary negotiation and discursive institution building, Isard’s (1949, 1956) original grand vision for a ‘general theory of the space-economy’ at once aimed to be *unifying* and *pluralistic*. In essence, the idealized ‘channels of synthesis’ in the Isardian system readily called upon a broad spectrum of intellectual positions from diverse schools of economic thought, at least with regard to their stylized epistemological perspective, if not always their practical methodological approach (cf. Isard, 1960). From inception, the ambition for regional science was to be a larger intellectual enterprise than the sum of its disciplinary parts.<sup>5</sup>

It is in this regard, or perhaps more precisely, in the epistemological pluralism that this vision implies, the field may be facing its biggest crisis and may yet have to overcome its most enduring challenge. After more than sixty glorious years, regional science as a post-war scientific project has reached a historic cross-roads—a juncture that in many ways is characterized by an increasingly polarizing and siloed dialogue between regional economists and economic geographers (Barnes, 2003). While the possible origins of ‘regional science in crisis’ and their jarring consequences were first identified some twenty years ago, (e.g., Isserman, 1993; Lane, 1993; Bailly and Coffey, 1994; Pavlik, 1995; Polèse, 1995) little programmatic progress appears to have taken place since.

While the crisis in regional science (and with it the urgent need for new directions) refuses to go away two decades on, this chapter takes the view that the persistent rumours of the death of regional science are greatly exaggerated. Instead of more apocalyptic prognostication, I hope to delineate a constructive way out of what I see as mostly a self-imposed intellectual cul-de-sac. In particular, I propose a renewal from within that builds on an exegesis of the ideational and institutional foundations of

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<sup>5</sup>Chapter 12 of Isard’s (1960) magisterial *Methods of Regional Analysis*—at close to 200 pages by far the longest, but perhaps least remembered—identifies five ‘channels of synthesis’ that form the interdisciplinary core of regional science method: (i) Interregional input-output analysis; (ii) urban spatial structure; (iii) gravity modelling; (iv) values-social goals framework; and (v) the operational fusion of all previous channels. See also Schaeffer, Jackson, and Bukenya (2012) for a recent discussion of regional science as an integrative social science project.

the field. Rather than a plea for more transdisciplinary cross-fertilisation from related disciplines (e.g., [Bailly, Coffey, and Gibson, 1996](#)), mine is thus a deliberately *narrow* stance vis-à-vis the field's original cast of characters, calling for a more conscious engagement with the history of regional science thought.

In order to contextualize my argument of a 'retrospective forecast' for the next fifty years in regional economic research, we need to briefly engage with the project's primordial epistemological and methodological roots. An important tenor among Isard and his early followers was the shared sentiment to guard against what [Colander \(2014\)](#) has recently criticised as the 'wrong type of pluralism' in the social sciences, i.e., pluralism that is paralyzed by cacophonous conversations and saturated with language games, permitting little actual cross-fertilization of methods and approaches. Indeed, the early conceptualizations of multidisciplinary approaches to regional analysis during the early 1950s were already accompanied by these very concerns. Eventually, these efforts to overcome bounded disciplinarity, epistemological dissonance and methodological differences would culminate in the inaugural meeting of the Regional Science Association in Detroit in late 1954 ([Isard, 2003](#), chs. 2 and 3).

Recently, the intellectual upsets of the financial crisis have added new fuel to this original discussion about disciplinary pluralism in regional science; this time, much of the ideational soul searching is centered around rekindled tensions in the orthodoxy-heterodoxy nexus in economics proper (cf. [Dobusch and Kapeller, 2012](#); [Skott, 2014](#); [Hands, 2015](#)). More specifically, much of this current wave of disciplinary introspection hinges upon an unsatisfactory treatment of the role of the monetary-financial system for the macroeconomy in mainstream economics. In many ways, the analytical integration of the real economy with the monetary-financial economy has emerged (once more) as the 'Holy Grail' of post-crisis economics (cf. [Laidler, 2011](#); [Lavoie, 2015](#)).

Surprisingly, similar developments in regional science and urban economics are noticeable only by their absence. To the contrary, the neoclassical tenets of the NNUE orthodoxy seems to have emerged from the financial meltdown intact, as if vindicated, and any momentum for new post-crisis directions in urban and regional economic theory appear to have been lost. The triumph of *real* analysis over *monetary* analysis in regional science is perhaps best illustrated by the fact that even the solitary mention of 'money' in *Fifty Years of Regional Science* (2004), the predecessor to our book here, is merely using the term as a synonym for informational frictions ([McCann and Shefer, 2004](#), p.183). The entire volume does not contain a single reference to credit (in the financial sense).<sup>6</sup>

Above all, these conceptual lapses constitute missed opportunities to explore in more detail *how theories of money, credit and banking are brought to bear on the analysis of the space-economy*. In this sense, the disciplinary self-examination of the 'regional science in decline' debate of the past two decades has, paraphrasing [Mirowski \(2013\)](#),

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<sup>6</sup>Monetary frictions that are consistent with the neoclassical dichotomy include the slow adjustment of nominal quantities, such as, for example, sticky prices, and money illusion. Importantly, this form of monetary non-neutrality would still be considered part of Schumpeter's real analysis as it predominantly concerns itself with the impact of the nominal money stock on real variables. In the same sense would Milton Friedman's monetarism also be considered as part of real analysis despite its "money does matter" maxim.

created more heat than light, and a perfectly good intellectual crisis may have been wasted in that no significant new research programs have emerged in the process.

To the extent that orthodoxy in economic thought has a tendency to emerge from heterodoxy (Davis, 2008), the early multidisciplinary explorations about the scope of regional analysis present an important juncture for understanding the discipline's current orthodox intellectual core. In this sense, the research agenda outlined in this chapter describes a new heterodoxy that emerges from a return to the heterodox origins from which the regional science project arose. The next section situates the treatment of monetary phenomena in the work of Lösch and Isard within the larger pantheon of the history of economic ideas, thus laying the ideational foundations for a comprehensive research agenda on regional aspects of money and credit.

### 3 Lösch and Isard as monetary thinkers

Broadly speaking, monetary theory traditionally distinguishes between two separate approaches to money. The first, which includes 'metallism', develops monetary theory from the transactions, store-of-value and unit-of-account needs of a basic exchange economy with an exogenous amount of high-powered government money. The second approach, which includes 'chartalism', views money as a hierarchical form of credit which renders it essentially endogenous to the economic system.<sup>7</sup>

Rather than further emphasising their common roots in terms of location theory, one of the central aims to this chapter is to engage with Lösch and Isard in terms their monetary thought. More specifically, I will suggest that both Lösch and Isard can be viewed as important nodes in a long lineage of *chartalist tradition* of monetary theory.

#### 3.1 August Lösch's Schumpeterian heritage

Lösch was a student of Schumpeter's at the Friedrich-Wilhelms-Universität Bonn, obtaining his doctorate in 1932, the final year of Schumpeter's tenure as department chair before taking a position at Harvard. It is precisely during this period that Schumpeter worked most intensively on his grand treatise on money, *Das Wesen des Geldes* ([1943] 1970), which, over the course of its forty year gestation period, experienced an inordinate amount of trials and misadventures and was only published posthumously.<sup>8</sup>

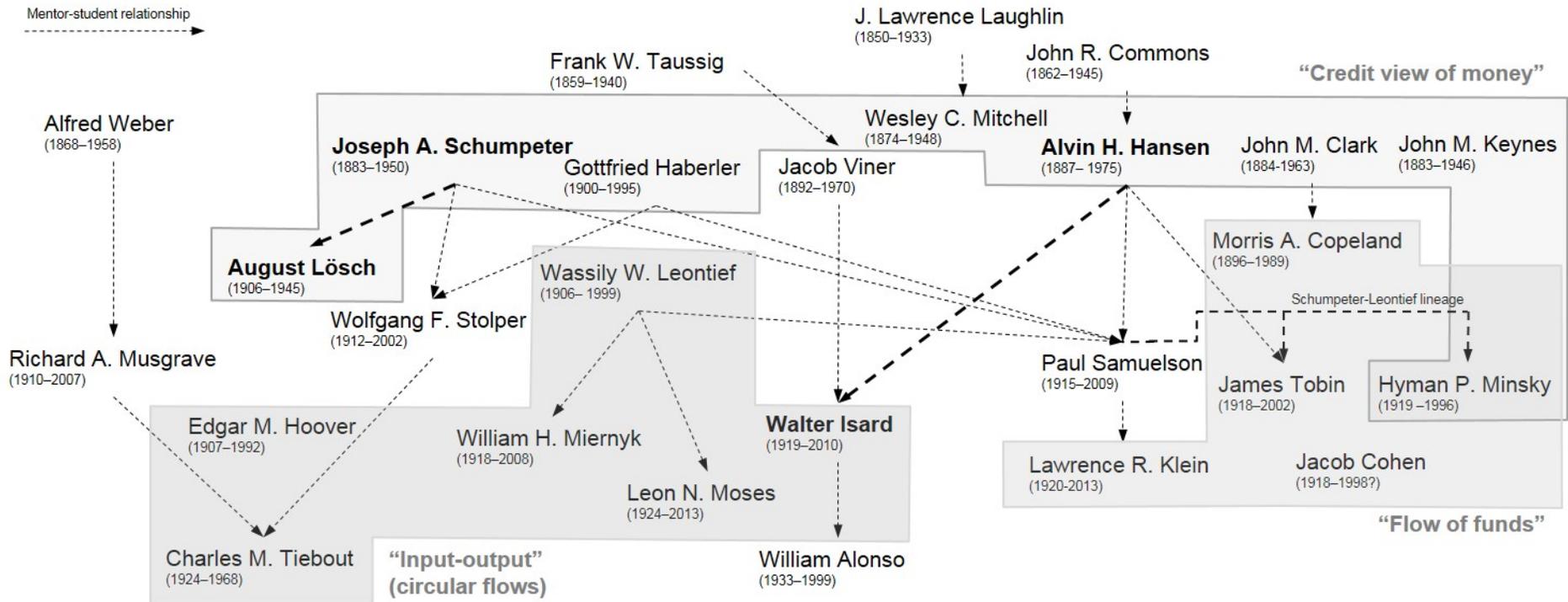
Examining the monetary content of the Löschian oeuvre in more detail, I argue in Bieri (2016) that a hitherto overlooked aspect of his contribution is the development of a spatial theory of price level determination in a way that is consistent with credit theories of money, including the notion of monetary non-neutrality and money that is created endogenously. Indeed, Schumpeter's own monetary insights

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<sup>7</sup>The broad chartalism-metallism dual finds its earliest, modern systematization in von Mises (1917). Schumpeter (1954), arguably a 'chartalist' himself, classified Marx as a 'metallist' and Keynes as a 'chartalist'. See Trautwein (2000) and Arestis and Mihailov (2011) for more detailed overviews in terms of possible classifying the literature on monetary thought, including a good survey on the literature related to the 'credit view' of money.

<sup>8</sup>See Messori (1997) and Alvarado (2014) for a detailed chronology of Schumpeter's struggle with *Das Wesen*, the origins of which can be traced back to his *Das Wesen und der Hauptinhalt der theoretischen Nationalökonomie* (1908).

Figure 1: Lössch-Isard lineage of monetary thought in regional science



Notes: The Lössch-Isard lineage of monetary thought is visualized as a mentor-student relationship, highlighting key areas of research in regional science ('input-output' and the 'flow-of-funds' analysis) where a 'credit view' of money perspective is instrumental to the integration of the spatial linkages between the real and financial sector. See main text for more details. Source: Author's illustration.

have shaped Lösch's thinking on spatial aspects of money and credit to a significant degree. Beyond Schumpeter's direct influence, Lösch's broader intellectual formation takes place during the waning years of the Weimar Republic, a period of intense monetary debate in Germany that—from Kahn, to Lautenbach and Neisser—was marked by a series of neglected contributions to a 'credit view' of money that has recently attracted renewed attention.<sup>9</sup> On these grounds alone, the lack of recognition of Lösch's contributions to monetary theory, let alone his attempt to link the real and financial in a synthesis of location theory with modern credit theory represents a historical curiosity, if not a puzzle.<sup>10</sup>

Once in the New World, Schumpeter remained an important element in the development of Lösch's career and theorizing; it was not only with the help of his old mentor that Lösch was able to spend two extensive research stays in the U.S. on a Rockefeller Fellowship (1934-35 and 1936-37), but access to Schumpeter's own academic network—from Haberler, to Taussig and Hoover—became instrumental for much of the novel theorizing that shaped both the first and second editions of his path-breaking *Die räumliche Ordnung* (1940c; 1944).<sup>11</sup>

Figure 1 illustrates Lösch's rich lineage of monetary thought as a central node in a dense network of mentor-student relationships among a wide spectrum of monetary theorists on both sides of the Atlantic, all of whom, to varying degrees, can be grouped as espousing a 'credit view of money' during the interwar period. Specifically, Lösch's (1940a,b,d) work on money, credit and financial markets acknowledges the importance of capital flows throughout the urban hierarchy, highlighting the spatial relationship between financial variables and institutional functions, such as interest rates or credit intermediation. Furthermore, Lösch (1949) recognizes that money and credit are fundamentally hierarchical in nature and that all money is credit money, even state money. The Löschian perspective on money and credit will be discussed in more detail in section 4.

### 3.2 Walter Isard and the influence of the 'American Keynes'

In tracing Isard's monetary heritage, Alvin Hansen's influence stands out above anyone else. In his own account of Hansen's vital role during his intellectual formation at Harvard, Isard refers to Hansen not only as the source for contemplating monetary factors as causes of the regional business cycle, but also as a "towering exception amid the widespread continued ignorance among Anglo-Saxon economists" with regard to the importance of location theory (Isard, 2003, p.9).

At Harvard, Isard also came to study under Abbott Usher, who, in addition to his famous work on the transformational role of technology, was in the midst of a large project on the history of the early credit system in Europe (Usher, 1943) when Isard

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<sup>9</sup>Laidler and Stadler (1998), Klausinger (1999), and Laidler (2012) for a discussion of neglected contributions to monetary theory by German economists during the interwar period.

<sup>10</sup>See Bieri (2016) for more discussion of this point in particular.

<sup>11</sup>It is clear from Lösch's own records (partly published in Riegger, 1971) that Schumpeter was more than an academic mentor, but also a personal inspiration and close friend with whom he resided several times in Cambridge, Mass. during his Rockefeller fellowship stays.

arrived in Cambridge. Perhaps more importantly, Usher became, after the death of his European-trained colleague and mentor F. W. Taussig, something of a resident expert on the work of the German Historical School, particularly the work of Gustav Schmoller, who emphasized the effects of space on the trajectory of economic development (Molella, 2005).

As with Lösch, a closer examination of Isard's main works reveals the clear intellectual imprinting of the mentors on the student's work—a fact that is best witnessed by the dedication of *Location and Space Economy* (1956) to both his teachers Hansen and Usher. It is Usher's influence that gave the impetus for Isard's foundational *QJE* (1949) article wherein he introduces an English-speaking general interest audience to the nuances of German location theory, including the work of Lösch. At the same time, however, Isard credits Hansen for kindling his interest in locational analysis and its relevance for to national policy (Isard, 2003, p.8).

Although Hansen is mostly remembered for his 'Keynesian' stance in the context of post-war U.S. public policy, earning him the popularized moniker of the 'American Keynes' (cf. Breit and Ransom, 1982), a central component of Hansen's work during the interwar period propounded a continental-style monetary theory of the business cycle—work that has regained prominence today in the context of a recent revival of his term 'secular stagnation'.<sup>12</sup> As a representative of the banking school tradition, Hansen played a pivotal role in the transformation of 20<sup>th</sup> century monetary thought, advocating Keynesian fiscal activism and strong monetary restraint for economic stabilisation (Mehrling, 1997, 1998). Indeed, Hansen's banking school position on the monetary transmission mechanism and credit creation is perhaps most clearly visible in Isard's own position regarding the importance and role of monetary institutions for interregional flows.

After taking courses at Harvard, Isard moved to Chicago to study for a Ph.D. where, in addition to Frank Knight and Oskar Lange, Jacob Viner soon became Isard's most important (monetary) point of reference (see also figure 1). And perhaps in equal measure because of Viner's complex and contested role in defining the Chicago Monetary Tradition (e.g. Nerozzi, 2009) and Isard's own early exposure to Keynesian thinking at Harvard, he eventually positions himself against some of the Chicagoan tenets regarding "how money matters". For example, Isard rejects Viner's ([1937] 1975) assertion that there are "problems which fall within the domain of international trade and which distinguish it from domestic and intranational trade, particularly those associated with monetary phenomena." (Isard, 1954, p.320n).

Little later, in his seminal *Location and Space-Economy* (1956), Isard takes an even stronger monetary stance, suggesting that "[it is] invalid to take the position that price and monetary phenomena are merely surface manifestations and reflections of the more nearly basic and underlying relations and interactions of man with his physical environment" (Isard, 1956, p.6). By the time *Methods of Regional Analysis* (1960) is published as an explicit sequel to *Location and Space-Economy*, Isard has

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<sup>12</sup>See Summers (2014a,b) for the contemporary revival and re-interpretation of Hansen's interwar idea of 'secular stagnation' in the context of the post-crisis limits of monetary policy to accomplish much more with interest rates at their lower bound.

integrated his ideas on the regional role of money and credit into a ground-breaking treatment of the regional flow of funds, where linkages between the institutional evolution of money, credit and banking and the spatial structure of moneyflows form central pillars of the analysis.<sup>13</sup> As discussed more extensively below, Isard understood that the structure of regional economic activity is influenced by how institutional components of the monetary-financial system (financial instruments, financial markets, monetary and financial intermediaries) promote the interregional mobility of funds and, by extension, the mobility of funds among the various sectors of the space-economy.

## 4 Integrating Lösch and Isard: Elements of a synthesis

In an extension of Schefold's (1997) characterisation of Schumpeter as a 'Walrasian Austrian' and Keynes as a 'Classical Marshallian', Lösch and Isard might each be viewed as 'Austrian' and 'Classical' with respect to their monetary ideas in general and their positions on the non-neutrality in particular.<sup>14</sup> In addition to details about Lösch's and Isard's intellectual lineage, figure 1 also provides a conceptual mapping of key areas of regional research where a monetary and credit perspective on the linkages between the real and financial sector offer significant promise. In particular, such work would focus on how structural linkages identified by input-output analysis tie in with regional moneyflows studies within the larger context of a 'stock-flow consistent approaches' (SFCAs) to macroeconomic modelling.<sup>15</sup>

### 4.1 Monetary hierarchy and spatial non-neutrality in the Löschian system

With regard to Lösch's (1940c,d, 1949) pioneering analysis of the spatial consequences of monetary-financial arrangements, I document elsewhere (Bieri, forthcoming, 2016) how this work contains hitherto neglected important theoretical insights for theorizing the flow of credit money across space. Specifically, I show that these lesser-known aspects of Lösch's work are broadly consistent with a spatialized version of (Post) Keynesian monetary theory, in particular with regard to some aspects of liquidity preference, the loan-to-deposit causality, and circuitist notions of the flow of funds

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<sup>13</sup>Throughout, I adhere to Copeland's original terminology in his seminal *Study of Moneyflows in the United States* (1952) which uses 'moneyflows' as one word, rather than a hyphenated or two-word term.

<sup>14</sup>The mainstream claim about the original classical economists' adherence to the 'classical neutrality postulate', i.e., that money-stock changes affect only the price level and not real output and employment, is subject to much debate (Humphrey, 1991).

<sup>15</sup>In their most general form, SFCAs to macroeconomic modelling are based on the strict discipline of social accounting matrices (SAM), relating all the flows and the stocks of an economy. SFCAs have their origins in the pioneering work of Copeland's (1947, 1952) flow-of-funds analysis and have recently re-gained prominence among, particularly among Post Keynesians, as a heterodox methodology for macroeconomic modelling based on stock-flow relationships, the flow of funds, interrelated sectoral balance sheets, and double-entry matrices. See Caverzasi and Godin (2015) for a survey of this literature.

(cf. Dow and Earl, 1982; Arestis, 1988, 1996; Chick and Tily, 2014).<sup>16</sup>

At the same time, Post Keynesian monetary theory also implies what can be considered a ‘hierarchy of monies’ in that the modern monetary system is a hybrid, that is part public (‘outside money’, a net asset to the private sector) and part private (‘inside money’).<sup>17</sup> It has both public and private liabilities that circulate as money (Bell, 2001; Mehrling, 2013). Indeed, two specific aspects of Lösch’s analysis of the spatial consequences of monetary-financial arrangements provide a useful lens for linking the hierarchy of money to the spatial structure of the financial system.

First, Lösch (1949, 1954) recognizes that money and credit are always and everywhere fundamentally hierarchical in nature and that all money is credit money, even state money. Table 1 illustrates the hierarchy of money in the Löschian system as a spatial monetary order where money and credit are created by different financial institutions at separate levels of the hierarchy. The Löschian monetary pyramid can be read both institutionally and, perhaps more importantly, in a functional manner, i.e., in terms of what constitutes money and credit as an accepted mean of settlement. In fact, with regard to the spatial propagation of changes in the price level, Lösch observes that the “shifting of the price level occurs only with credit creation; that is, with a hierarchy of different kinds of money, whereas in a region with a uniform currency, the price waves started by a shift in purchasing power necessarily suffice for transfer” (Lösch, 1954, p.227).

A central feature of this monetary hierarchy is the fact that the distinctions between money and credit are not strict and largely depend on the specific vantage point from within each layer of the system. In this system, gold and deposits at the Bank for International Settlements are the ultimate money because they are the ultimate means of international payment. Currencies, both international money and national money, are deemed a form of credit insofar as they are promises to pay gold. Similarly, further down the hierarchy, bank deposits are viewed as a form of private credit money, effectively promises to pay currency on demand and thus twice removed from the promises to pay ultimate money. Private money in the form of debt obligations or securities is then a promise to pay currency or deposits over some specific time horizon.

Another crucial feature of this hierarchical view of money lies in the fact that at each layer the ‘moneyness of credit’ depends on the credibility of the promise by a given issuer to convert a specific form of credit into the next higher form of money. In other words, what counts as money and what counts as credit depends on the layer of the hierarchy under consideration, on what counts as ultimate means of settlement. The translated and augmented version of Lösch’s original table in the bottom

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<sup>16</sup>Throughout, I will use the convention of using the capitalized, non-hyphenated version of writing ‘Post Keynesian’, largely in keeping with the self-identification of the thinkers who use the label. See Davidson (1991), King (2002, pp.9–11), and Lavoie (2014, pp.42–45) for a discussion of the deep semantics behind the four different ways in which the term can be written (hyphenated or not and capitalized or not).

<sup>17</sup>The distinction between ‘outside money’ and ‘inside money’ goes back to seminal work of Gurley and Shaw (1960). In this context, ‘outside money’ is either of a fiat nature or backed by some asset that is not in zero net supply within the private sector, whereas ‘inside money’ is an asset backed by any form of private credit that circulates as a medium of exchange.

Table 1: Hierarchical money in the Löschan system

1. Geld höchster Ordnung:	Weltgeld	(Bargeld: Gold; Buchgeld: BIZ)
2. Geld hoher Ordnung:	} Teilgeld	} Großraumgeld (£, <i>RM</i> ) Nationalgeld (Banknoten, Zentralbankgut- haben, mitunter entsprechendes Regionalgeld)
3. Geld mittlerer Ordnung:		
4. Geld unterer Ordnung:		
5. Geld unterster Ordnung:		
		Privatbargeld (private oder fis- kalische Schuld- urkunden, beson- ders Wechsel)

Translated (and augmented) version:

} Outside money*	1. Highest-order money:	Global money	(Currency: Gold; credit money: BIS <sup>†</sup> )
	2. High-order money:	} Regional money ('partial money')	} International money <sup>‡</sup> National money
	3. Mid-order money:		
} Inside money	4. Lower-order money:		Private credit money
	5. Lowest-order money:		Private money
			National commercial and retail banks, regional and local (community) banks Private or fiscal debt obligations, in particular commercial paper

Notes: This 'monetary order' links the hierarchy of money on the left hand side to the spatial structure of the financial system on the right-hand side. \* 'Outside money' is either of a fiat nature or backed by some asset that is in positive net supply within the private sector, whereas 'inside money' is an asset backed by any form of private liabilities (credit) that circulate as a medium of exchange, an analytical distinction first introduced by [Gurley and Shaw \(1960\)](#). <sup>†</sup> BIZ/BIS: Bank für Internationalen Zahlungsausgleich/Bank for International Settlements, Basel, Switzerland. <sup>‡</sup> Corresponds to both 'top currency' and 'patrician currency' in the terminology of [Cohen's \(1998, 2003\)](#) currency pyramid. Source: Original table with monetary hierarchy in [Löschan \(1949, p.59\)](#). Author's translation and adaptation.

panel of Table 1 reveals that the Löschian monetary hierarchy maps directly into a Post Keynesian-Minskian perspective of monetary hybridity according to which the credit pyramid oscillates between a condition where money is ‘scarce’ and one where credit is ‘elastic’ (Wray, 2009; Mehrling, 2013).

Second, Lösch’s (1940c,d) work on financial markets acknowledges the importance of capital flows throughout the urban hierarchy, highlighting the spatial relationship between financial variables and institutional functions, such as financial regulation. Indeed, Post Keynesian monetary thinkers assign functional and institutional variation one of the most influential pathways for change in real-financial linkages (e.g. Dow, 1982; Chick and Dow, 1988, 1996). Another important, related perspective that is consistent with Lösch’s work comes from Minsky’s (1991, 1993) re-emphasis of Keynes’ (1930) fundamental insight that the non-neutrality of money needs to be a “deep part of the system, not an afterthought in a capitalist economy” (Minsky, 1996, p.78). Indeed, the similarities between Lösch’s monetary thought and that of Minsky are far from coincidental: as figure 1 illustrates, both were students of Joseph Schumpeter’s (Lösch at Friedrich-Wilhelms-Universität Bonn, and Minsky at Harvard).<sup>18</sup>

## 4.2 The flow-of-funds perspective and Isardian monetary space

In what follows, it will be useful to recall that Isard shared with Lösch the intellectual heritage of accessing location theory via the comparatively mature analytical apparatus of interregional trade theory.<sup>19</sup> Deeming to him the “most prominent living location theorist”, Haberler suggests that Isard has succeeded “more than anyone else to combine trade and location theory in a comprehensive general equilibrium model comprising more than two countries and commodities as well as the space factor” (Haberler, 1961, p.5n).

For the purposes of our discussion here, I want to highlight the conceptual importance of Isard’s synthesis in terms of linking two separate but related strands of examining the sectoral structure of the regional economy. More specifically, Isard connects the structure of regional production with its corresponding moneyflows, and, in doing so, he aligns the flow-of-funds accounting pioneered by Copeland (1947, 1952) with Leontief’s ([1928] 1991) conceptualization of the economy as a circular flow upon which all input-output methods, once the analytical workhorse of regional scientists, are based.

Figure 2 illustrates the core of this flow-based interregional system in the Isardian space-economy. Both graphics are reproduced from the first edition of Isard’s seminal *Methods of Regional Analysis* (1960)—a fact that is worth highlighting here since the analysis of regional moneyflows had all but disappeared by the time the 7<sup>th</sup> and final edition of *Methods* (1998) was published.<sup>20</sup> The upper portion of the figure underlines

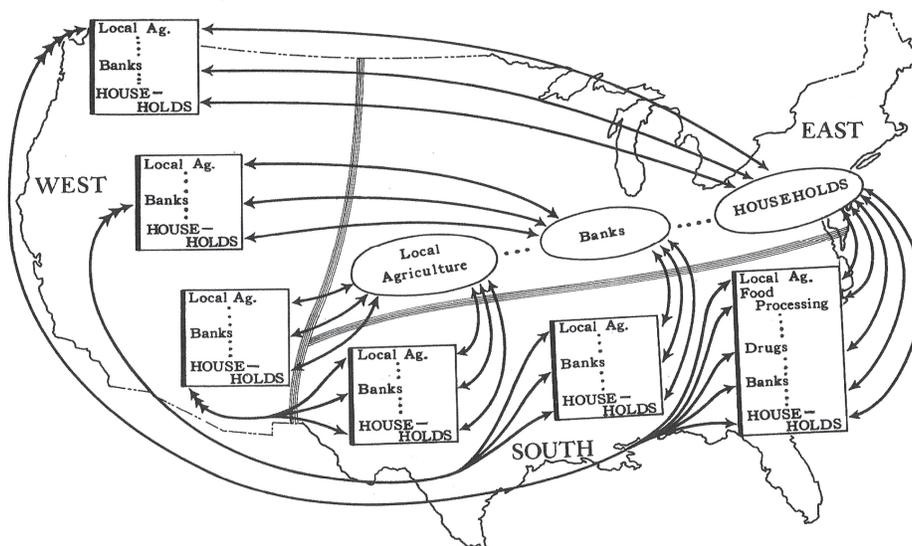
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<sup>18</sup>The Lösch-Minsky relationship and its deep connection to the misadventures of Schumpeter’s *Das Wesen des Geldes* ([1943] 1970) are discussed in more detail elsewhere (Bieri, 2016).

<sup>19</sup>In this regard, both Lösch’s and Isard’s foray into location theory can be viewed as the template for Krugman’s (1998) discovery of space as the ‘final frontier’.

<sup>20</sup>Perhaps mirroring much of the ‘monetary amnesia’ that befell regional science over the last half century, this

Figure 2: Moneyflows across the space-economy



(a) Moneyflows across sectors

SECTOR RECEIVING, BY CATEGORY OF TRANSACTION		East							South			West						
		1. Local Agriculture	2. Food Processing	20. Drugs	35. Banks	36. Investors	37. Other Investors	NONLOCAL AGRICULTURE	NUCLEARONES	GOVERNMENT	HOUSEHOLDS	1. Local Agriculture	35. Banks	HOUSEHOLDS	1. Local Agriculture	HOUSEHOLDS	TOTALS	
EAST	1. Local Agriculture																	
	A. Commodity Exchange																	
	B. Investment Account																	
	C. Insurance																	
	K. Demand Deposits																	
	L. Time Deposits																	
	Grand Total																	
	35. Banks																	
	A. Commodity Exchange																	
	O. Corporate Securities																	
P. Mortgages																		
Q. Consumer Credit																		
Grand Total																		
HOUSEHOLDS																		
A. Payroll																		
B. Investment Account																		
Grand Total																		
WEST	1. Local Agriculture																	
A. Commodity Exchange																		

(b) Regional flow-of-funds matrix

Notes: Panel (a) illustrates a set of hypothetical interregional moneyflows across different sectors of the economy. Panel (b) presents a schematic representation of a corresponding flow-of-funds matrix across different sectors of the space-economy. Source: Isard (1960).

the weblike connectivity of interregional moneyflows that arises from the balance-sheet relations of different sectors of the space-economy. The lower portion of the figure provides a regional money flow matrix representation of economic activity that is consistent with and expanded and refined by [Cohen \(1968, 1972, 1987\)](#).

The most important aspect of Isard's theoretical innovation lies in his vision to base interregional analysis on the implicit linkages of the three major national accounting statements, i.e., the national income and product accounts, the input-output tableaux, and the flow-of-funds accounts. In particular, his insight of complementing standard input-output relationships with monetary stock-flow data was well ahead of its time and essentially anticipates what the rapidly expanding field of Post Keynesian stock-flow-consistent models—except for the fact that the latter have yet to develop a regional perspective! In bringing together the Isardian approach with the Löschian system, the next section now attempts to delineate the broad contours of a research agenda of the role of money and credit in the regional economy.

### 4.3 Linking regional moneyflows and the hierarchy of money

While the Löschian hierarchy of money provides the institutional and functional vector that underpin the spatial non-neutrality of money, Isard's regional flow-of-fund linkages form the accounting lens through which its outward appearance becomes empirically tractable. [Figure 3](#) visualizes the key components of this Lösch-Isard system wherein the financial accounts follow funds as they move from sectors, such as households or firms that serve as sources of funds (net lenders), through intermediaries (financial institutions) or financial markets, to sectors that use the funds to acquire physical and financial assets.

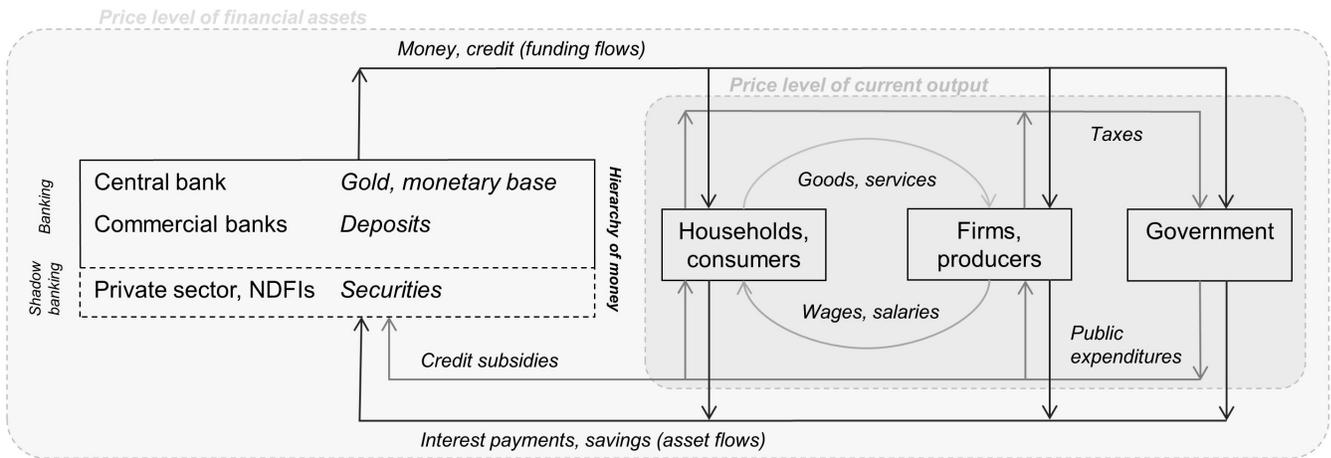
In particular, the focus on the sources and uses of funds in the lower panel of [Figure 3](#) helps to emphasise the two key elements of the Löschian monetary system introduced above, namely, the hierarchical relationships between different forms of money and credit on the one hand and the (spatial) non-neutrality of money via the price level of output and the price level of financial assets on the other hand. In this setting, the non-neutrality of money arises from the simple fact that, for each sector  $i$  in region  $j$ , real transactions and financial transactions are closely linked as investment ( $I$ ) and increases in financial assets ( $A$ ) equal saving ( $S$ ) and increases in financial liabilities ( $L$ ) such that  $I_{ij} + A_{ij} = S_{ij} + L_{ij}$ .

Much of what both Lösch and Isard had originally envisioned by way of integrating the real and the financial for regional analysis took several decades before it was formalized by two Nobel Laureates, Leontief and Klein, in terms of an interface between input-output and flow-of-funds analysis (cf. [Klein and Glickman, 1977](#); [Leontief and Brody, 1993](#); [Klein, 2003](#)). Despite these advances, it took several additional decades plus a major financial crisis before the importance of real-financial linkages, particularly financial flows and the composition of sectoral balance sheets, was more broadly recognized. A good six decades since it was originally conceived, flow-of-funds analysis is at long last experiencing veritable renaissance, propelled by

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development remained unremarked in all of the major reviews of the book.

Figure 3: The hierarchy of money and the flow of funds



	Financial sector		Households		Firms		Government	
	<i>Use</i>	<i>Source</i>	<i>Use</i>	<i>Source</i>	<i>Use</i>	<i>Source</i>	<i>Use</i>	<i>Source</i>
Real transactions	$I_{fin}$	$S_{fin}$	$I_h$	$S_h$	$I_f$	$S_f$	$I_g$	$S_g$
Financial transactions	$A_{fin}$	$L_{fin}$	$A_h$	$L_h$	$A_f$	$L_f$	$A_g$	$L_g$

for each sector,  $I_i + A_i = S_i + L_i$  such that:

<i>Surplus</i>	$S_i - I_i = A_i - L_i$	: non-financial sources → net financial savings	<i>Money outflow</i>	$A_i - L_i > 0$
<i>Deficit</i>	$L_i - A_i = I_i - S_i$	: financial sources → product expenditures	<i>Money inflow</i>	$L_i - A_i > 0$

*Notes:* Schematic representation of the flow of funds across different sectors of the economy, paying particular attention on the hierarchical relationships between different forms of money and credit. The lower portion of the figure presents a sectoral flow-of-funds table that is consistent with the money-flow accounting pioneered by Copeland (1947, 1952) and its extensions by Cohen (1972, 1987). See main text for more details. *Source:* Adapted from Bieri (forthcoming).

flurry of academic and policy interests aimed at understanding central aspects of the financial crisis that the conventional equilibrium-based mainstream models were not able to capture by design (e.g. Palumbo and Parker, 2009; Bezemer, 2010; Winkler, van Riet, and Bull, 2013; Borio and Disyatat, 2015).<sup>21</sup>

Table 2 summarizes our preceding discussion in terms of the most important conceptual differences between the orthodox view of money in regional science and its Lösch-Isard alternative. In particular, table 2 compares these competing paradigms of monetary theorizing along key dimensions, namely, money, interest, prices, and the nature and structure of financial intermediation. Indeed, of the “continuing muddles in monetary theory”, as Goodhart (2009) puts it, several are particularly relevant for the regional analysis of money because they are so deeply embedded in the theoretical fabric of NNUE view of money. Above all, this includes the analysis of the monetary base multiplier of bank deposits, the current three-equation neoclassical consensus, assuming perfect creditworthiness, and hence no need liquidity intermediation and the analysis of the evolution of money. For each of these dimensions of monetary analysis, the last column of table 2 outlines a few high-level areas of theoretical and empirically inquiry that are implied by the Lösch-Isard view. While too numerous to be elaborated in detail, I shall briefly discuss a few of the topics for expositional purposes.

For example, the financial crisis has reminded policy makers just how much the dynamics of regional cost of living adjustments depend on a clear understanding of house price movements, particularly in the U.S. where the recovery of house prices has shown substantial regional heterogeneity. Even in the absence of nominal exchange rate movements and trade barriers, some of the observed deviations from regional purchasing power parity (PPP) are even more persistent than their international counterparts. Indeed, relative price levels among U.S. cities have historically shown mean reversions at an exceptionally slow rate, seemingly in contrast to recent evidence of falling transportation cost and the strong regional integration of the U.S. economy (e.g. Cecchetti, Mark, and Sonora, 2002; Chen, Choi, and Devereux, 2006). While non-traded local goods and services are one common real sector explanation for such deviations from PPP, the two-price level perspective of the Lösch-Isard view would suggest additional monetary phenomena, such as regional asset price inflation in the housing market, as an alternative causal pathway.

Similarly, discussions about regional differences in interest rates commonly assume that such divergences strictly reflect real factors, above all the balance between *ex ante* saving and *ex ante* investment which drive equilibrium in the goods market. Thus, in the standard view of real analysis, by construction, there is no difference between saving and financing (Borio and Disyatat, 2011; Borio, 2014). The monetary analysis of the Lösch-Isard view, by contrast, would highlight that such regional interest rate differentials represent a purely monetary phenomenon whereby variations in local credit conditions, not informational frictions, drive a wedge between the market rate and the (unobservable) natural rate.

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<sup>21</sup>See Bieri (forthcoming) for a discussion of the Leontief-Klein connection to Minsky’s (1977, 2008) financial instability hypothesis. Cf. also the ‘flow of funds’ box in figure 1.

Table 2: Key dimensions of the monetary space-economy

	<i>Orthodox view</i> (NUUE-NEG)*	<i>Lösch-Isard view</i>	<i>What are the (monetary) questions?</i>
<i>Nature of analysis</i>	“Real”	“Monetary”	
<i>Economic fluctuations</i>	Business cycle <sup>†</sup>	Interaction between financial cycle, business cycle	(i) Finance-growth nexus of regional development; (ii) regional economic adjustment;
<i>Money</i>	Neutral, exogenous <sup>‡</sup>	Non-neutral, endogenous	(iii) geography of money and inflation (e.g. regional money multiplier); (iv) optimal regional currency areas;
<i>Interest</i>	Natural interest rate <sup>§</sup>	Market interest rates	(v) regional interest rate differentials; (vi) regional capital market integration;
<i>Prices</i>	One price level (real output)	Two price levels (Financial assets, real assets/output)	(vii) regional cost of living differentials; (viii) spatial purchasing power parity, law of one price;
<i>Financial intermediaries</i>	Reduction of frictions, information asymmetries	Credit creation, transfer of purchasing power	(ix) regional transmission mechanism of monetary policy; (x) structure of financial intermediation (e.g. spatial disparities in credit creation by non-depository financial institutions); (xi) regulatory arbitrage across space;
<i>Deposits</i>	Sectoral endowments	Created by loans	(xii) regional deposit concentration; (xiii) spatial disparities in the ‘moneyness’ of deposits;
<i>Source of investments</i>	Savings	Financing flows	(xiv) regional discrepancies in liquidity preference; (xv) regional flows of finance vs. collateral; (xvi) spatial distribution of credit subsidies;
<i>Flow of funds</i>	Current account, net capital flows	Gross capital flows	(xvii) regional balance of payments (BoP); (xviii) classical ‘transfer problem’ vs. monetary approach to BoP; (xix) regional reserve flows.

Notes: \*\*“New neoclassical urban economics” (NNUE) and new economic geography (NEG). <sup>†</sup>Real business cycle theory in the tradition of new classical macroeconomics. <sup>‡</sup>Includes superneutrality of money, i.e., real variables are not only unaffected by the level of the money supply, but also by the rate of money supply growth. <sup>§</sup> The natural interest rate is unobservable, reflecting only real factors. Explanations for the source of divergences between the market and the natural rate differ between the Lösch-Isard view and the conventional view. See text for more detail. Source: Author.

## 5 The Future

Overall, a return to the foundational works of Lösch and Isard offers important opportunities for regional science's next half-century. Methodologically, the future of regional science thus lies in a rediscovery of the project's "macro-foundations", particularly in terms of its national accounting traditions that provide the intellectual undergirding for much of the work on input-output analysis and the flow of funds. Epistemologically, the future of regional science also ought to be more pluralistic by including heterodox approaches, such as Institutional, (Post) Keynesian, and socio-economic perspectives. With regard to the particular re-engagement of monetary analysis in Schumpeter's original sense, regional scientists could play an important role in this intellectual effort, not at least because these lesser-known aspects of Lösch's and of Isard's work are consistent with a spatialized version of central tenets of heterodox monetary theory.

In linking the structure of intersectoral money and credit flows with the structural relationships that govern the intersectoral flow of goods and services, the Lösch-Isard analytical framework outlined in this chapter aligns well with the renewed academic interest in modelling the pathways between financial markets and the macroeconomy.<sup>22</sup> Furthermore, this chapter has also identified a research agenda associated with the development of a spatial theory of money and credit as key research frontier for the next half-century of regional science. Specifically, I have argued that a re-engagement with the monetary foundations of the intellectual touchstones of regional science could yield a wide array of promising theoretical and empirical research for the future.

In addition to providing directions for the future, a return and re-interpretation of the foundational texts in regional science could help establish a much needed compass to anchor the enterprise more solidly in the intellectual space of its peers—something that has long been identified as being critical for reverting the discipline's decline, or—perhaps more optimistically—for living up to its full promise and potential (e.g. Isserman, 1993; Lane, 1993; Isard, 2004). While the reigning paradigms in regional science will not be changed overnight, it is my hope that this chapter marks a modest new beginning, not only in terms of a specific details of a revival of Lösch's and Isard's monetary tradition, but also in providing the impetus for a reconceptualization of a disciplinary grand narrative in regional science—in particular, a narrative that is faithful to the intellectual tradition of comparative political economy, including a growing '(regional) varieties of capitalism' literature and a (re)discovery of traditional business cycle and institutional thinking among urban and regional scholars.

In conclusion, then, the approach presented in this chapter argues for a return to the ideational roots and for a re-projection of the fundamental ideas whereby regional aspects of money and credit are re-cast as central pillars of a Lösch-Isard synthesis. As such, for spatial economists and economic geographers alike, regional science remains *the* systematic project tasked with advancing the theory and measurement of the *space-economy*.

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<sup>22</sup>See Morley (2016) for an overview of the recent literature on macro-finance linkages.

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