The metaphorical characterization of equilibrium, economic crises, and business cycles.

1. Summary of the research plan

The recent financial and economic crisis has brought to the fore the difficulties current economics has in explaining —let alone forecasting— such events. Some economists reacted by arguing the case for alternative approaches, drawing in particular on Marxist and Keynesian ideas. Instead, our proposal takes a historical perspective: we want to inquire into the reflection on crises at the time of the shaping of modern economics, namely towards the 1870s when the 'marginalist revolution' in economics took place. This was also the time when crises theories started to be recast in terms of theories of the business cycle. Our aim is to examine the theoretical paths that have been followed and those that have been discarded in the actual historical development of the discipline, in order to enable an assessment of the potentialities that have been lost.

The focus will be on the following problem. Economic crises have recurred at semi-regular decennial intervals during most of the 19^{th} century. Economists and commentators have produced multiple explanations of the phenomenon, which was often interpreted as being caused by something breaking the equilibrium that characterizes the normal state of the economy. These writers therefore postulated the existence of a relationship between crises and equilibrium (or 'normality') which, however, was rarely specified in a precise manner.

We aims at characterizing more precisely the nature of this relationship, as seen by different economic schools and within the main European national traditions in economics in the decades around 1870. Around that time, in fact, both the notions of 'equilibrium' and 'crises' began to change and acquire the features they have today. Economics started to be mathematized, and both these concepts began to be defined in mathematical terms. The transition took time, and some passages were not spelt out very precisely. We therefore want to circumvent the problem of the insufficient specification of the main concepts by using a new approach: we propose to inquire into the metaphors used to express these concepts both in the academic and in the more popular literature, in French, German, English and Italian.

The literature on metaphors stresses that the use of tropes transferring the properties of some object to another object does not fulfil only a purely ornamental function but serves different purposes: for instance illustrative (it conveys meaning by explaining something new by means of something with which the reader is more familiar), rhetoric (by persuading the reader by reference to a better established science), heuristic (by understanding an object by means of a comparison with another, or by transferring a selected set of properties from an object to another), analytical (by modelling an object in terms of another), or epistemological (by transferring to one process the kind of laws governing another one). We thus believe (also based on previous studies we have conducted) that the analysis of the metaphors used in our chosen context will reveal at a very deep level the views of our writers on crises, on equilibrium and on their relationships.

Besides trying to resolve with a new method the history of economic thought problem of understanding the evolution of, and the relationship between, the notions of crises (later business cycles) and equilibrium and normality, we also think this approach will unearth some metaphorically formulated perspectives that have been discarded in the process of focusing on mechanical analogies but would perhaps enable both contemporary economists and the laypublic to look with different eyes at the problem of the economic crises that still affect our economies.

2. Research plan

2.0 Statement of the problem.

In 1844, discussing *National distress: its causes and remedies*, Samuel Laing described "the alternations of hot and cold fits of commercial depression and excitement, to which the country has been, for many years past, periodically subject" (Laing 1844, p. vi). He was not talking of simple accidental oscillation in the state of trade, but in using the terminology associated at the time to recurrent fevers (e.g., malaria) he stressed at once their gravity, violence, and the approximate regularity in their recurring. Similar characterizations, although sometimes stressing different features, were common throughout the nineteenth century. Claims that economic crises (or commercial distress, panics, revulsions, convulsions, depression, as they were denoted at different times) periodically disrupt the regular course of business date back at least to the end of the eighteenth century (Sinclair 1796, p. 23), as do the first attempts to characterize their features (soon revealing common traits in their morphology) and especially to supply an explanation not only of crises themselves but also of their recurrence. Progress was slow in the first decades of the century, but by the middle of the century it was fairly largely agreed that crises tended to recur with a decennial rhythm, that they were a consequence of what happens during the prosperous phase (often characterized as 'excesses'), and that in their aftermath more viable conditions of trade were re-established.

The rapid acceleration of the literature (often of a topical character[1]) throughout the nineteenth century witnesses of the importance generally attributed to the subject. Nevertheless, specific explanations of the phenomenon differed,[2] as did the suggested remedies and the very notions of crises. A survey of the definitions of the term 'crisis', however, boils down to two major families: those defining crises in terms of one or another of their features (e.g., disruption of credit, stoppage of exchanges, fall of prices), and those defining them as disturbances (or the result of disturbances). Among the latter, some writers explicitly defined crises as a disturbance to the equilibrium of supply and demand (most of the writers in this group were German-speaking), others defined them as disturbances to an ill-defined 'normal' or 'healthy' state of affairs (see Besomi 2012b, 80–84). Sometimes, one can easily recognize 'equilibrium' in this generic 'normal' state, in particular as 'normal' was understood as a theoretical norm (not to be confused with today's statistical sense of the term); in other cases the conceptual relationship between 'normal' and 'equilibrium' is more fuzzy, although often the features of the 'normal' have common traits with the features associated with equilibrium. Be it as it is, more often than not the idea of 'crisis' has something to do with the notion of 'equilibrium' or at least of a 'normal state' of the economic system.

This relationship between crises, equilibrium and the 'normal' is not well defined, in part because all these notions were undergoing conceptual changes, in particular in the second half of the nineteenth century and in the early decades of the twentieth. Moreover, the relationship is not even symmetric: while crises theorists often referred to equilibrium in order to identify the cause of disruption,

[1] As noted by John Mills in 1868 (p. 11), "It is scarcely a matter for surprise, and still less for regret, that every commercial crisis occurring in this country is promptly followed by a literature of pamphlets, discussing the phenomena and their supposed causes, while they are yet a matter of painful interest to the public mind". For a rough bibliometric quantification see Besomi 2012b.

[2] This was noted by contemporary writers, as for instance McCulloch ("On this question, various and contradictor opinions have been formed; and if the notorious fact of the public distress has united the sentiments of all parties on this single point, they seem to differ as widely as ever in their judgements as to the causes of it" (McCulloch 1816, p. 375) and Duncan ("According to Hudibras, and other learned authorities, 'every why has a wherefore;' and so various are the theories which have been formed on this subject, that it might almost be added, that 'every man has a wherefore'" (Duncan 1842, p. 5).

equilibrium theorists carefully avoid referring to crises, except for blaming them to causes exogenous to the proper working of the system.

The present project aims at examining the problematic aspects of this relationship, focusing in particular on the decades around the so-called 'marginalist revolution' in economics. To do so, we propose to use an approach that has rarely been resorted to in a systematic way —namely, we want to circumvent the insufficient determinateness in language (and sometimes in analysis as well) that characterized the early approaches to both equilibrium and crises and the conceptual evolution of these very notions by means of a thorough examination of the metaphorical transfers these writers used to conceive and express their ideas, using as a corpus the literature (specialistic, but also in newspapers) in French, German, English and Italian.

The objectives we think of achieving are the following:

a) The proposed research contributes to the history of economic ideas by an in-depth examination of:

a_1) the systematics of the core beliefs of crises theories in the late 19th century and of the early stages of business cycle theories;

a_2) the relationship between the 'normal' (often clad in metaphors referring to health, soundness, solidity, good weather etc.) and equilibrium;

a_3) the mapping of the relationship between crises and equilibrium in different economic traditions.

b) The methodology of inquiry is innovative in that it provides the first systematic survey of metaphors used in published sources: although there are some examinations of metaphors in the economic literature (see section 2.1 below), they tend to follow the usage of one specific metaphor (or a group or related metaphors) rather than considering them synchronically and diachronically at once.

c) The proposed research contributes to the discipline of economics at large by ascertaining which paths in the development of the notion of crises (and business cycles) have been discarded, and whether these could have some pertinence for the reflection on more recent economic crises.

d) The proposed research enables the public at large to interpret **current debates on crises by providing a description of the meaning and usage of the metaphors for crises that historically were developed as a guidance to the fundamental issues at stance.**

In the following part of this section we explain more in detail 1) why we have chosen to discuss the problem of the relationship between crises and equilibrium; 2) why we focus on the decades around 1870; 3) why we think the analysis of metaphors is the best method for tackling the problem we have chosen to discuss. The results we expect to reach are further explained in section 2.5.

a) Why this subject?

'Equilibrium' is a central concept in most theoretical approaches to economics, although different traditions of thought understand it in different ways: classical economists interpreted it either as the natural order of things, or as a gravitational concept indicating the state towards which the economic system tends, or in dynamic terms (Tieben 2012), or again in terms of the conditions at which the system can preserve and reproduce its own state (Lunghini 1988); since the 1870s, 'marginalist' economists understood it as a mathematical condition or as the solution of a system of equations, or as a position of rest (Dore 1984), as a balance of forces, or again as a state where there are no tendencies to change. Notwithstanding the differences in interpretation, most economic theories are constructed precisely around the equilibrium concept. Its attributes may be (again, depending on the traditions of thought to which the theories belong) a general well-being, the clearing of markets, the smooth running of business, the absence of non-frictional unemployment, optimality in some sense: all features very suitable for an ideological interpretation of the working of the economic system —often described as the 'normal' state of the system, introducing a term that requires clarification especially in its relationship to the concept of equilibrium. Most economists believe that the economic system tends towards a state of equilibrium; a few consider instead such a condition to be unstable, provided that it can be reached at all.

Yet the economy is fairly frequently (and almost regularly) subject to disturbances of various degrees of seriousness, or to remarkable fluctuations in time. Such events are characterized by the interruption of credit, trade and production, unemployment of labour and capital, loss of income, gluts of markets —in short, the opposite of what is supposed to take place in equilibrium. Such conditions have been denoted as crises or as the downward phase of business cycles. Equilibrium on the one hand, and crises and cycles on the other, are antithetical, yet complementary, concepts: the crisis can only be understood by comparison to equilibrium. During the crisis equilibrium breaks down,[3] and the economists who believe that the economy tends towards equilibrium have to introduce within their theoretical system the possibility that equilibrium is temporarily broken (due e.g. to friction or temporary maladjustments, or to external or political disturbances) in order to account for crises (or, for the writers reasoning in terms of 'normality', one must be able to account for the anomaly); on the contrary, economists who believe that the economic system's equilibrium is unstable, must explain why the economy fails to break down but continues to function, even if not in an optimal way.

Arguably, it is precisely in the relationship of crises and equilibrium that is one of the most fundamental dichotomies in economic thought. As Keynes loosely[4] but elegantly put it:

> On the one side are those who believe that the existing economic system is, in the long-run, a self-adjusting system, though with creaks and groans and jerks, and interrupted by time lags, outside interference and mistakes. [...] These authorities do not, of course, believe that the system is automatically or immediately self-adjusting. But they do believe that it has an inherent tendency towards self-adjustment, if it is not interfered with and if the action of change is not too rapid. On the other side of the gulf are those who reject the idea that the existing economic system is, in any significant sense, self-adjusting. They believe that the failure of effective demand to reach the full potentialities of supply, in spite of human psychological demand being immensely far from satisfied for the vast majority of individuals, is due to much more fundamental causes. (Keynes 1934, 486–87)

It goes without saying that Keynes placed himself among the 'heretics' of the second group. The dichotomy, however, originally depicted by Löwe (1926) was explicitly accepted as fundamental also by 'orthodox' writers such as Hayek (1929) or by business cycle theorists such as Mitchell (1927, pp. 3–4), Bouniatian (1922, pp. 3–4), Harrod (1934, p. 469), and especially Kuznets (1930).

b) Why the decades around 1870?

For the theory of equilibrium, the early 1870s are usually seen as a watershed. It is the time when, almost simultaneously, Menger (writing in German), Jevons (writing in English), and Walras (writing in French) introduced similar concepts of marginal utility that broke with the classical tradition of political economy and eventually led to formalizations (in explicit analogy with physical laws) by means of equations, the solution of which define the equilibrium state of the system. The new paradigm became established by the turn of the century (the Jevonsian and Mengerian versions) or a few decades later (the Walrasian version). This led to the abandonment of the old approach to equilibrium and to a complete redefinition of the scope, method and language of economics.

Around 1870, the approach to crises also began to change. In the early part of the nineteenth century, most writers treated crises as anomalies, deviations (caused by exogenous events or bad policies, especially protectionism or mismanagements of the currency) from the condition of progress that characterizes the 'normal' state of an undisturbed economy. Towards the middle of the century, the

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[3] Such a statement would hardly have been disputed until the advent of equilibrium and real business cycle theories in the late 1970s and early 1980s. The latter, in particular, has reversed the previous approach by describing each stage of the cycle (indeed, and position of the economic system) as an equilibrium reaction to changes in aggregate productivity (technology shocks).

[4] The passage is cited from a radio talk; hence the use of the intuitive term 'self-adjustment' in contrast with the more technical expressions 'equilibrium' and 'stability'.

dominant view considered that crises were the result of an intrinsic tendency of a credit economy to 'overtrade', that is, to enter into speculative trading in a spiral of inflation supporting further speculation in turn again increasing prices until the situation would become unsustainable. The crisis would then be the elimination of such excesses, bringing the system back to 'normal' (or to equilibrium) at the price of temporary losses, bankruptcy and unemployment. The emphasis was on the inflation of trade and its consequent collapse, not on the conditions of recovery, although it was clearly recognized that such events repeat with some regularity in pattern and timing. It is around 1870 that some writers (beginning from Mills 1868, followed by Bagehot 1873) started to consider not prosperity, but the entire cyclical process, as the 'normal' state of the economy. By the end of the century, business cycles theory was well on the way to replacing the theories of crises; with the growing professionalization of economics that was taking place at the same time, the reference to the ill-defined 'normal' state of the economy was substituted by a more rigorous terminology, bringing equilibrium explicitly into the theoretical frame.

c) Why metaphors?

The usage of images from outside the disciplinary domain is found almost universally in the economic literature (and also in most other disciplines, hard sciences included[5]): in journal articles, textbooks and treatises, pamphlets and newspaper articles; in the work of the pioneers as well as in the most recent literature; in all languages; in different uses, in particular as metaphors, analogies, similes or metonymies. They are applied with different purposes: to take up Hoffman's conveniently concise list, "scientific metaphors have been shown to serve a remarkable variety of functions:

(1) To suggest new hypotheses, hypothetical concepts, entities, relations, events, or observation terms,
(2) To predict and describe new phenomena or cause-effect relations,
(3) To give meaning to new theoretical concepts for unobservable or unobserved events,
(4) To suggest new laws or principles,
(5) To suggest new models [or] refinements of old ones,
(6) To suggest new research methods or ideas for experiments or hypothesis tests,
(7) To suggest choices between alternative hypotheses or theories, often a choice between more and less fruitful metaphors,
(8) To suggest new methods for analyzing data,
(9) To contrast theories or theoretical approaches,
(10) To provide scientific explanations in the form of metaphoric re-descriptions,
(11) To suggest alterations or refinements in a theory,
(12) To suggest new theories, theoretical systems, or world views. In a sense, metaphors, images, and models are embryonic theories in that they can lead to the generation of mathematical or other formalisms which other theorists then can use, perhaps without explicit reference to the initial images or models" (Hoffman 1985, pp. 332–333). Metaphors (let us, for the sake of brevity, use this term to encompass all forms of transfers from one domain to another via figures of speech[6]) are thus frequently powerful ingredients of the thought process, be it in the phase of its creation or of its transmission.

The present research proposal is based on the idea, forcefully stressed by metaphor scholars in various fields (from philosophy of science to linguistics), that metaphors enter at a very deep level in the understanding of problems and in their subsequent conceptualization, and that for this reason the analysis

5 See a list of disciplines in which the usage of metaphors has been documented in Hoffman 1985, p. 329.

6 This practice is followed routinely by the journal *Metaphor and the social world*, acknowledging that the border line between metaphors and other types of figurative language is often blurred and inviting researchers to extend the domain of inquiry into different types of tropes in so far as they are relevant to the process of interaction of thought and language (Cameron and Low 2011).

of metaphors enables researchers to disclose the most fundamental principles of scientific theories. The metaphor is not only conducive to concepts formation, but provides the guiding thread to the interpretation of the world (Blumenberg 1997, p. 88).

Prior to 1870, as the language of economics was literal and often not precise, the full implications of the notions of 'equilibrium' and 'crisis' were usually somewhat vague and gave much room for interpretation.[7] Even after that time, when the analytical language of both equilibrium theory and crises/cycles theories became increasingly formalized, the pre-analytical premises of economic theories are often not explicitly expounded and left hidden in the assumptions guiding the formulation of models. The figurate language used throughout the entire century (and, of course, beyond) is often revealing of the underlying interpretation of the working of the economic system, sometimes in very broad terms (one of the features of metaphors is that they are semantically richer than concepts) and sometime in its details (this is most often the case since the beginning of the 20th century, as with the increasing weight of formalized models metaphors tended to be substituted in part by analogies[8]). A study of the usage of figurate language is therefore one of the keys for exploring the deep-lying premises on which specific theoretical approaches are built, and to answer the questions 'what *are* crises and business cycle?', and 'what role do they play in the unfolding of the economic system's dynamics?'

Consider, as an example, the pair of metaphors 'health' and 'disease' applied respectively to the 'normal' or to the equilibrium state of the system and to crises and depressions. The image is ubiquitous: we find it in the main European languages (English, French, German and Italian) since the early seventeenth century till the most recent literature.[9] Its precise meaning and way of usage changed in time following the evolution of these notions in their original domain, yet the very pairing reveals the antinomic coupling of equilibrium and crisis in economics, which most mainstream equilibrium theorists would be very reluctant to admit in plain words. The idea of 'disease' opens to the possibility (or indeed necessity) of 'remedy', but also of 'death' (the term 'crisis' itself originate from the Greek word meaning 'decision', and in its original medical connotation indicates the point at which a diseased organism either heals or dies), while the idea of 'health' suggests that the system should not be tampered with, and that the conditions for a good working of the economy are satisfied and should be preserved.

2.1 State of the research on the subject

While there exist a few ponderous studies of the concept of equilibrium in different economic traditions[10], a systematic and comprehensive history of the theories of crises and cycles is still wanting. There is only a handful of book-sized histories of the subject: one was written at the end of the 19th Century (the still unsurpassed Bergmann 1895), one surveyed monetary theories in the nineteenth century (Miller 1827, part IV), one surveyed the state of contemporary business cycle theory, covering the

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[7] The notion of 'equilibrium' first appeared in an economic dictionary only at the end of the 19th century, and it was written by an advocate (Davidson 1894). Entries on 'crises' date back to 1835 (see Besomi 2012b for a discussion).

[8] The pendulum, for instance, was at first used broadly to describe a fluctuating behaviour tending nevertheless towards equilibrium, while in the hands of econometric modellers it inspired the precise mathematical form of the equations: see Louçã 2001 and Besomi & Scott, in preparation.

[9] From Gerald Malnyes *Canker of Englands common wealth* discussing "the vnknowne disese of the politicke body of our weale publicke" (1601, p. 3) to Evangelatos & Carayannis's discussion of the transfer of the disease image and epidemiological analogies to economic crises (2014).

[10] This sentence is the very title of one of the most recent and complete works on the subject, Tieben 2013; much older, yet comprehensive, is Magaud 1950. Other books covers specific traditions of thought: Donzelli 1986 discusses neoclassical economics, the volume edited by Sebastiani 1992 covers Keynesian economics, Finkelstein 2000 discusses the mercantilists, several writings focus on general equilibrium theory (for instance Bridel 1997 on the early years, Ingrao & Israel 1990 and Weintraub 1991 cover the entire range).

interwar years in its first edition and subsequently updating it with the developments of Keynesian economics (Haberler 1937), a fourth one (the little known Shukla 1968) cursorily summarizes the main classical approaches and a few writers in the early business cycle tradition to focus on Keynes and post-Keynesian writers, four focus on a specific aspect in the early debates, namely Say's law of markets (Sowell 1972, Hutt 1974, Bridel 1977, and Kates 2003), while the only recent attempt to survey the entire field was written by an engineer (Tvede 2001), who offers interesting insights but also suffers from severe shortcomings (see Besomi 2003). There are of course several chapters in books, entries in dictionaries and essays in journals outlining the history of cycles and/or crises theories. Notably, however, the discussions of crises/cycles in relation to equilibrium are very scarce in spite of the suggestion by Löwe (1925) and Hayek (1933) that a classification of business cycle theories should focus on the fundamental problem of how the behaviour of the economic system is conceived with respect to the theoretical norm. Three entries on cycles in economic dictionaries tried different approaches: Altschul 1933 and Niggle 1999 focused on the stability or instability of equilibrium as making crises incompatible with, or theoretically conceivable within, the theoretical framework, while the long essay by Thomas Balogh (1956) discussed the matter from a particular notion of equilibrium, Say's law of markets. Weintraub discusses a closely related problem —namely, the relationship of equilibrium and dynamics beginning from the mathematical treatment of the latter in the interwar years— in a book published in 1991.

The notion of 'normality' (in the sense of 'theoretical norm') has not been explored in detail, in spite of having been the counterpart of the notion of 'crises' throughout most of the 19th century (as Samuelson later pointed out, "pathology illuminates normalcy"[11]), having been referred to in the work of early 20th century business cycle theorists such as Hawtrey, Robertson and Hayek, and having entered monetary theory terminology as the Wicksellian and (separately) Sraffian 'normal rate of interest'. There is only one book devoted to the topic, and it was written in 1906 (Pinkus), as well as an article by Oppenheimer (1911).

As to metaphors, the general literature (in particular philosophical and linguistic) is immense: fairly comprehensive reviews of the various approaches can be found in Ortony 1993 and Gibbs 2008; a more recent selected bibliography was compiled by O'Donnel 2013. Specifically to economics, there is some interesting literature[12] on the general significance of figurate language in economic thought (McCloskey 1985 and 1995 and Klamer *et. al.* 1988 with particular emphasis on its rhetorical role; more generally, Henderson 1994 and Lunghini 2013), on the construction of economic models (Morgan *et al.* 1999, Morgan 2012, Gilboa et. al 2014), on linguistic aspects (Herrera-Soler and White 2012), on the transfer of knowledge from biology and physics to economics (Cohen 1994; Finkelstein 2002, Mirowski 1994), and on mathematical formalism (Weintraub 1991, 2002). There is also a vast literature on specific aspects of metaphors (for instance, there are detailed explorations of issues concerning the mechanistic metaphors in Adam Smith; Marshall on mechanistic vs. biological analogies; Schumpeter and evolutionary biology); the mechanistic metaphor, in particular, has been explored in some detail (e.g. Lowe 1951, Sebba 1953, Thoben 1982, Oetsch 1993, Mirowski 2006).

Of direct interest to us are the studies on the metaphorology of equilibrium and crises/cycles. There are an old book (Dumontier 1949) and a few papers dedicated to the metaphors of equilibrium (in particular Mouchot 2000, and Mirowski & Cook 1990). Interesting, but scattered and unsystematic, observations can be found in writings concerned with specific authors or schools in the volumes on

[11] Samuelson 1963, p. 534n; see also Canguilhem 1966, and for a short discussion in English of the rise of the concept of normality in the 19th century see Hacking 2002, Ch. 19.

[12] For the sake of brevity, reference is made only to book-lenght writings.

equilibrium cited above. As to the metaphors for crises and cycles, besides a few studies on figurate language in specific economists (e.g., Le Gall 1999, and Cot 2013) and a masterly analysis of the pendulum metaphor at the origin of the early mathematical model of business cycles (Louça 2001 and 2007), the financial crises of the end of the 20th and beginning of 21st century have drawn the attention of commentators who, however, have focused more on linguistic[13] than on heuristic, methodological or analytical issues.[14]

The existing literature has scarcely touched upon several themes that are of interest for this project: the usage of metaphors for crises in the Victorian period (with the exception of Alborn 2001); the transition form a metaphorical to an analogical usage of figurate language in the shift of emphasis from crises to cycles theories; the topic of our research, namely the metaphorical rendition of the relationship of equilibrium and crises, is practically virgin ground.

2.2 State of the research on this subject by the research team

Members of our team have years of research experience precisely on the topics of the inquiry, although they have so far worked in isolation while the project requires to find the connections among these streams of research.

The main expertise of the applicant, Roberto Baranzini, concerns the most important and difficult propounders of the marginalist approach to equilibrium, Léon Walras. Roberto Baranzini is one of the most eminent proponents of the scholarly approach that has led to subvert the previous interpretation of the writings of Léon Walras (Baranzini 2005a, 2008a, 2016). By examining Walras's texts in their historical context and adopting the author's own epistemological approach, Baranzini (together with Pierre Dockès) made apparent the divergence between Walras and the subsequent marginalist tradition (Baranzini 2011), with which he used to be fully identified. This applies in the first place to Walras's successor in the Lausanne Chair, Vilfredo Pareto: in spite of using the same language (the mathematical formulation of general economic equilibrium), the two economists differ in their semantics and perhaps also in their ontology (Baranzini& Tatti 2002, Baranzini & Bridel 2003 and 2005, Baranzini 2008b, Baranzini & Allisson 2016).

With respect to the topic of this research project, Walras's position is that of an innocent link between the French liberal school (the *économistes*, as they were known at the time), with their understanding of equilibrium as the natural state of the economy and correspondingly of crises as mere disturbances, and Pareto, who was the true marginalist of the Lausanne school of economics.

The notions of equilibrium and crisis have already been studied in this context, but nothing has yet been done concerning their associated metaphors. Baranzini will therefore inquire into the transition of metaphors from the *économistes*, in particular J.-B- Say and F. Bastiat, to Pareto, via Walras.

A research topic that has kept the co-applicant, Harro Maas, busy for years is the economics of William Stanley Jevons, another of the three original propounders of the marginalist approach to equilibrium, has been Jevons's graphical depiction of the phenomenon of the business (or trade) cycle, and his efforts to get to grips with its multifaceted nature. Jevons's first extensive efforts to understand economic crises as cycles stem from his unfinished "Statistical Atlas" project, an ambitious effort in the spirit of William Playfair, to map the socio-economic history of Britain in a set of plates (Maas 2002, 2005, 2012). Largely unexplored remained and remains Alfred Marshall's use of Jevons's project for his The Economics of Industry (1879, co-written with his wife Mary Paley Marshall) and for his much later work on industry and trade (1919). While Jevons is searching for strictly mechanical explanations of

[13] Linguists have been very active in analysing the language of contemporary crises in the daily or financial press: see the writings cited in footnotes 16 to 22 below.

[14] An exception is Ceffa & Rovere 2015.

business cycle phenomena, using the balance as his main tool of understanding (Maas 2001), Maas's aim in his contribution to this project is to investigate how Marshall reinterprets Jevons's Statistical Atlas project along biological and organical metaphors to get at a very different understanding of recurring movements in the economy. A second aim is to tally Marshall's endeavour with his understanding of equilibrium in his Principles of Economics, written between his youthful and mature works on industry and trade.

For this project we plan to hire as a senior researcher Daniele Besomi, surely one of the foremost authorities on the theories of crises in the nineteenth century and the theories of cycles in the interwar years. Among his writings relevant to the present research plan we have some papers relating to several writers and theories on crises in the period of interest, of which the award-winning 2010a as well as 2010b, 2010c, 2012c.

Besomi has also written some surveys of the entire field centred precisely on our theme of interest, namely, how crises and cycles are understood with respect to the theoretical norm: in 2006a he discusses the epistemic aspects of this issue, while in 2008a and more extensively in 2008b he outlines and categorizes the theories of crises with respect to their relationships to equilibrium. In 2012a he discusses the historiographic position emerging from this approach to other classificatory enterprises. Also focusing on the relationship of cycles and equilibrium are Besomi 2007, 2006b, 2002 and 1999.

As to metaphors, Besomi authored a long paper on the disease metaphor for crises in the nineteenth century (2011), and one on the weather metaphor in the same period (2014). His 2012b paper discusses the usage of the various terms used in economics from the 18th century onwards to account for crises, cycles and related phenomena, also inquiring on the original metaphors in the etymology of such words. He is currently writing on the pendulum metaphor in economics (Besomi and Scott, in preparation) and on the metaphors for equilibrium and crises in the writings of Wilhelm Roscher around 1860 (Besomi and Hagemann, in preparation). He has presented some papers at conferences on out topic: in particular one on "Tradequakes, financial storms, and commercial tides: metaphorical characterizations of crises in the 19th century" at the 2014 ESHET conference in Lausanne, and one on "Metaphors for crises" at the conference 'Languages of crises" at York University (March 2016).

2.3 Detailed research plan

Discussing the metaphors for equilibrium and for crises/cycles requires in the first place to find the relevant instances of figurate language in the economic literature. Thanks to their expertise in the writings of Walras and Jevons, in the literature on which they relied and in their first commentators, the applicant and the co-applicant have of course acquired an extensive and detailed preliminary knowledge of what to look for in the literature on equilibrium. Researchers at the CWP have already collected and classified over 1,000 quotes on crises and cycles containing metaphors or other figurative language. The first step consists therefore in systematizing this body of information, and enlarging the search for other sources.

It should be noted in the first place that this is not merely a matter of listing examples of figurate language: "the finding of data is a hermeneutic act to be applied to the corpus by means of the understanding of the text, its referential meanings, its semantic and ideological associations, and its themes' structuring into their possible metaphorical value".[15] Not all metaphorical instances, therefore, are of interest to us. While linguists are interested in the mere presence of metaphors in the widest sense

[15] "Il reperimento dei dati è atto ermeneutico che si esercita sul testo attraverso la comprensione della lettera, dei suoi significati referenziali, dell'articolazione semantica e ideologica, dello strutturarsi dei temi nel loro possibile valore metaforico" (O. Besomi *et al*., 1995, p.1).

of the term,[16] we are only interested in the use of figurate language that has some relevance in the process of thought and/or communication: we are looking for metaphors helping in the process of discovery, or for understanding specific mechanisms, or for exemplifying and expounding results by making them similar to something with which the reader is more familiar, or again for transferring procedures from other domains of knowledge. For instance, phrases like “the pendulum has now begun to swing in the other direction”, used by an Anonymous in 1899 to indicate that business has become prosperous after having been depressed for some time, are of moderate interest for our research, as they only indicate that a turn of events is as unsurprising as the pendulum changing direction; on the contrary, the same expression used as follows is meaningful to us: “There is nothing improbable in this; the pendulum swings one way because it had swung the other way before; each swing is the cause of the next” (Erdos 1971, p. 386). The first of these two examples simply records a change that had taken place in the past, while the second refers to a causal mechanism linking the upward and downward movement. Our search for metaphors, therefore, will not consist in the mere recording them, but will require a preliminary sifting and evaluation of their relevance, and an assessment of their role in the argument.

One of the main issues to be examined consists in the very broad ‘root metaphors’ (Black) or ‘conceptual metaphors’ (Lakoff & Johnson) which define the most basic understanding of the subject matter of the discipline. The various specific metaphors used to describe ‘equilibrium’ or ‘crises’ belong to a small number of alternative visions concerning these phenomena: some are mechanical, others interpret the economic system as an organism, others still compare it to a ship at sea that must be governed, others again to a building with specific requirements for its stability, or to a casino. Numerous historical studies have argued that since the marginalist revolution in 1870 the mainstream notion of equilibrium essentially relies on physics (see the references given in Le Gall’s quick survey 2002), with a few relevant exceptions including Marshall’s organicistic analogies. Crises and cycles were also subjected to a shift towards the mechanistic analogy, in particular at the hands of the econometricians in the 1930s who modelled their understanding on the pendulum (Louça 2007). Nevertheless, the move has not fully conquered the field: linguistic studies have shown that, at least so far as the financial and economic press is concerned, the recent crises have been discussed by means of metaphors derived from roots other than mechanical: the medical metaphor (referring the economy to the pathology of an organism) is still very much present;[17] there are also references to turbulence in fluids,[18] wars or physical conflicts,[19] bad weather or natural disasters,[20] meltdowns[21] and others,[22] among which the existing examples of mechanical metaphors are not prominent. This is worth exploring, because it seems to indicate a mismatch between the mechanistic worldview characterizing equilibrium (that is, the very

[16] For instance, linguists would record the presence of images indicating spatial movement, associating upward and forward movements with some positive feature and downward or backward motion with negative characteristics; this approach also includes in the count of metaphors verbs such as ‘drop’, ‘fall’or ‘plummet’ (the general reference is Lakoff & Johnson 1980; examples in this perspective applied to the recent economic crises are Charteris-Back & and Ellis 2001, Esager 2001, Bickes et al. 2014, or Chow 2014, p. 8).

[17] Charteris-Back & Ellis 2001, Šeškauskienė & Urbonaitė 2007, Silaški, & Đurović 2010, Bounegru & Forceville 2011, Esager 2011, Puehringer & Hirte 2013, Soddemann 2013, Whang *et al*. 2013, Bickes *et al*. 2014.

[18] White 2004, Arrese 2015. Notably, this metaphor characterizes part of the technical literature modelizing economic dynamics by means of nonlinear functional equations: Louçã 1997.

[19] Kelly 2001, Charteris-Back & Ellis 2001.

[20] Charteris-Back & Ellis 2001, Kelly 2001, Zanini 2009, Silaški, & Đurović 2011, Esager 2011, Bounegru & Forceville 2011, Puehringer & Hirte 2013, Soddemann 2013, Bickes *et al*. 2014.

[21] Kelly 2001, Horner 2011, Stronach et al. 2014.

[22] See e.g. the summary table in Arrese and Vara-Miguel 2015, p. 5.

heart of economic theory) and other perspectives characterizing crises and cycles, indicating that there is still a theoretical yawn between equilibrium and crises theories—in metaphorical terms, it is as if the laws of physiology could not account for disease or if the laws of acoustics would break down in cacophony.[23]

As to the procedure for collecting figurate images, it should be noted that the search for metaphors in corpora cannot, at the present stage of technological development, be automatised. There does not yet seem to exist an efficient software for identifying metaphors with a reasonable degree of completeness and accuracy (for a survey see Berber Sardinha 2012). The method to be employed starts from an accurate knowledge of the sources constituting the corpus of relevant texts for the task at hand, the extraction of the metaphors therein via an accurate reading of texts, the exploration of other contemporary texts looking for similar metaphors with the help of proximity search engines where available. As the reading and the metaphor list expand, more instances are likely to be found (especially because, as it was noted, metaphors tend to cluster:[24] Cameron 2008), thus widening the list further. This method is admittedly slow in the initial phases. But historians of economic thought have to read their sources anyway, and the time invested in the preliminary stages of the research will be made up in the analytical phase.

The corpora to be explored are readily available in libraries. Swiss libraries will be able to help to a large extent, and several very rich collections are digitized and searchable via the web.[25] Other digital collections will require instead visits to specialized libraries abroad (e.g., the Library of Congress or the British Library). Moreover, some pamphlets and newspapers sources of the late nineteenth century, which can not usually be borrowed, will require researchers to spend some time in French, British, Italian and German libraries (see list in the attached calendar).

While the corpus of documents on which the research will be based may seem very large, we have carefully thought about it and came to the conclusion that it is within our reach. First, we applicants and the senior research know our materials very well, and already have very precise information on which texts should be examined; Second, as already stated, we have already collected a large number of metaphors: not only part of the work is already done, but we have already developed a research strategy and have formed a very precise estimate of the time involved in the collection of further materials.

The second step will consist in analyzing these materials, focusing especially on the explicit or implicit intersection points between the metaphors on equilibrium and on crises. Of particular interest will be the pairs of metaphors contrasting these two notions. The equilibrium = health and crisis = disease comparisons has already been cited above. Other notable couples are: storms vs. fair weather; rough vs. calm sea; solid money vs. the quicksand of paper money; or the pendulum, used to indicate the stability

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23 The analogies are drawn from Canguilhelm 1966, Engl. transl. pp. 52–55.

24 Looking for 'financial storm', for instance, would return among numerous others the following hit: "We have been embarked upon a sea of paper money for years. We have suffered periodically financial crashes and revulsions, tossed upon its uncertain waves, blown up and down by the breath of speculation. We are still at sea, and in the beginning of a terrific financial storm, and the question is whether we shall seize the rudder and direct the ship, or suffer it to go without direction, to founder and make shipwreck of all public and private securities and values, to become the prey and spoils of wreckers along the shore" (Spaulding 1869, p. 115). This in turn suggests other metaphorical associations that can be further explored.

25 For instance the Kress and Goldsmith libraries, JSTOR, several collections of British and American newspapers (Access newspapers archive, ProQuest historical newspapers, Chronicling American: Historical newspapers online (free), Newsvault (Gale)) and periodicals (19th Century UK periodicals, Academic search complete (Ebsco), Historical periodical collection (Ebsco), American periodicals series online, British periodicals, Periodicals archive online), the digital archive of the Italian daily *Corriere della Sera* and more generally the emeroteca digitale at Braidense library, books can be downloaded and searched from Gallica, the Internet archive, Google books etc.

of equilibrium or, conversely, the persistence and rhythmicity of fluctuations or again, as a middle way, economic fluctuations around equilibrium. Some contrasts between equilibrium and crises (or the features eventually leading to a crisis) have metaphors on one side only, the other being term of literary language, such as in ‘gambling speculation’ vs. ‘legitimate trade’.

This analytical part of the research will require pulling together information gathered from different corpora: those concerning equilibrium and those concerning crises/cycles, based on different languages (in particular French, Italian, German and English, possibly also of Russian) and on different epochs (before and after the marginalist revolution, and before and after the invention of the business cycle). Indeed, one of the points of interest is to inquire whether different traditions in economics (different schools, but also different national approaches to the discipline) at different times are characterized by different uses of metaphors.

In detail, the analytical work will proceed via the identification of the property (or properties) of the ‘source’ term in the original domain of the metaphor that is (are) transferred to the ‘target’ in the economic domain. Statements such as ‘crises are the storms of the commercial world’[26] are meant to transfer to ‘crises’ some properties of ‘storms’. ‘Storms’, however, have different features that might be suitable to characterize crises. One specific writer selects some (or, as in the case of the example, does not specify which property has been chosen). Here lies at once the danger and the power of metaphors: the danger is that some of the properties of the source can be misleading if applied to the target; but other properties, which the original writer ignored or dismissed, may be powerfully suggestive to other writers who can transfer them to the target and use them to understand aspects that were missed before. This is precisely what happened with the crises = storm metaphor: in the 1830s, storms were evoked for their *universally* destructive power; a few decades later, they were seen as *selectively* destructive (or as cleaning the atmosphere from its impurities), affecting only weak or corrupted businesses and thus clearing the ground for a more solid economy; another few years later, storms were also seen to be irrigating the soil and thus facilitating the sprouting of new vegetation/businesses. The same source was thus used to transfer rather different properties to the target, actually giving rise (or at any rate reflecting) different theories of crises.[27]

Being built in triplets (source – *tertium comparationis* – target), metaphors tend to form tangled webs. Not only each source has different properties that can be transferred to one target, but the same (or a similar) property can be found in other sources, and different targets may share the same property: for instance, both financial crises and business cycles tend to recur with some rough periodicity, which in turn may be described by means of planetary orbits, the sequence of seasons, waves and tides, the pendulum, periodic comets, or intermittent fevers—each carrying different emphasis. Our analytical work will thus consist in reconstructing this web of relationships, examining in particular the slightly different but all important implications of the choice of one metaphor instead of another,[28] in particular at the intersection of the couples of metaphors describing ‘equilibrium’ and ‘crises’.

In order to make this research more extensive and thorough, we want to hire two research students, who would engage into Ph.Ds writing dissertations precisely on this topic and on this epoch. One of them will focus on the usage of metaphors in the literature on equilibrium and ‘normality’ in French and English, the other on the literature on equilibrium, ‘normality’, crises and cycles in the

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[26] The example is modified for clarity from “one of those storms in the commercial world which are known as ‘commercial crises’”: Bowen 1856, pp. 13–14

[27] For a full discussione see Besomi 2014.

[28] For instance, being passively dragged into the ‘vortex of speculation’ is rather different from willingly taking part into a (morally reprobable) ‘gambling speculation’, and the ‘fever of speculation’ is a different disease than a ‘madness’ or ‘mania of speculation’ as the latter imply some form of irrationality absent from the former.

German language. The former is likely to meet with more mainstream approaches, as the French and British traditions tended to consider crises as anomalies (or as the result of anomalies) with respect to the system's tendency to equilibrium, while the latter is more likely to meet writers who would admit that the economic system incorporates centrifugal forces capable of keeping the economy out of equilibrium: it is indeed in the German tradition of thought that crises were more frequently understood as part of the normal unfolding of the capitalist process, and it is here that the first 'mature' business cycle theories originated (Tugan-Baranowsky, Spiethoff, Schumpeter, to cite only a few). Together with the expertise of the applicants and the senior researchers, this should cover most of the ground, at least so far as the main European languages are concerned.

Our own analytical work will find a cradle in a dedicated conference we are planning to organize, where the research group, other members of the CWP, invited speakers and guests will present papers discussing the following topics:
1) methodological issues: metaphors and economic thought
2) metaphors of equilibrium around the times of the marginalist revolution
3) metaphors of crises around the time of the birth of the business cycle
4) crises: triumph vs. nemesis of equilibrium theory
5) Cycles as a middle way between crises and equilibrium (discussing e.g. the writings of Tugan-Baranowski, Aftalion, Mitchell)
6) from metaphor to analogy: figurate language in business cycle theory
7) pervasive metaphors (the changing meaning of the metaphors used to describe crises, cycles or equilibrium since the origin; or, in other words, metaphors seen in their context)

This should give some of the other doctoral students at the Walras-Pareto Centre to produce, as a complement of their doctoral dissertations, papers on the metaphorical aspects involved in the topics of their theses (only when relevant to our object of research).
Some potential participants have already expressed interest in presenting papers: Harald Hageman, Cécile Dangel-Hagnauer Luca Fiorito and Annie Cot. Others are being contacted

2.4 Timing

We expect this project to unfold in 3 years, probably from January 2017 (the few months between communication of the acceptance of this plan and the following January would give us time to advertise the Ph.D. positions and select suitable candidates.

The first year will probably be taken up mostly by the collection of materials, by all participants, while the analytical stage will take place in years 2 (here probably overlapping with further parsing of the corpus) and 3.

The conference/workshop will have to take place during the second half of year 2: late enough to allow participants to gather materials and write papers for it, and soon enough to permit the editing of the proceedings (the indexing will need much care, as it is one of the instruments enabling navigation between different terminologies and metaphors: see e.g. the indexes in Besomi 2012 as lauded by King 2012).

As to the detailed workload (see also separate calendar):

Roberto Baranzini, applicant, will co-ordinate the research, contribute two papers on metaphors of equilibrium and crises in Say, Bastiat and Walras and in Walras and Pareto, and co-edit the proceedings volume. His commitment will amount to 10% of his employment.

Harro Maas, co-applicant, will assist in the co-ordination of the research, contribute two papers on Marshall's relation to Jevons in his thinking on equilibrium and cycles, and co-edit the conference proceedings. His commitment will amount to 10% of his employment.

Daniele Besomi, senior researcher, will write a book on the metaphors for crises in the second half of the nineteenth century, and co-edit the conference proceedings.

The two Ph.D. students, junior researchers, will work 100% at the CWP in Lausanne to the preparation of dedicated dissertations as specified in the text above, and will assist in the preparation of the conference.

2.5. Relevance of the research

We expect this research to produce as scientific results:

1) in terms of contributions to our specific sub-discipline, the history of economic thought, with respect to our period of choice, we expect:

a) to be able to contribute to defining the notion of ‘normality’ in its problematic relationship to equilibrium. Although the problem has hardly been discussed, it is clearly at the heart of the large share of theories of crises of the 19th century and early 20th century that were formulated in terms of deviation from the normal state of the economy.

b) To considerably contribute to the understanding the development of crises and cycle theories with respect of their relationship to equilibrium/normality. This is a problem that in the 1920s and 1930s was generally recognized as the fundamental issue in business cycle theory, but which has since received little attention.

c) To contribute to the literature on metaphors with a systematic approach that so far is lacking. Methodologically, this will be a novelty.

2) In terms of formation and publication, the result will consist in the training of two doctoral students, and their two Ph.D. dissertations; a monographic book on the metaphors for crises and cycles in the second half of the nineteenth century, by our senior researcher; a specialized conference, plus a book collecting its proceedings (we emphasize that this will be of a strongly monographic character). Possibly also some articles to be published separately (this depends on the wealth of the materials that will be found). Surely members of our team will take part in general history of economic thought conferences, organizing thematic sessions.

3) In terms of contribution to economics at large, we feel that the problems we are planning to discuss has implications also for the understanding of contemporary economic crises. When, in November 2008, Queen Elizabeth II asked before the LSE faculty why nobody was able to predict the financial crisis that was unfolding under their eyes, economists had to face the fact that their models of financial markets did not allow for disequilibrium situations to amplify and bring the system to its knees rather than to converge back to equilibrium. This is precisely the kind of question we are asking. Our conjecture is that the contemporary approach results from some choices made at the time of the channelling of both equilibrium theory and crises theories on paths that were determined by the selection of specific metaphorical views, largely based on a mechanistic approach to the discipline. Although we will not be concerned with the recent crises and will not be able to answer directly the Queen’s question, we believe that the method of approach could be viable for understanding the relationship of crises to the contemporary theoretical thought on equilibrium, as suggested (section 2.4 above) by the mismatch between the conceptual metaphors used for equilibrium and for crises, which indicates that in spite of the concepts being obviously related the theory of equilibrium cannot incorporate a theory of crises.

In this perspective, this research has some potential for having a broader impact and being of public interest. As metaphors may provide building blocks (often at a very fundamental level) for the construction of theories, e.g. by comparing the undulating alternation of prosperous and bad times to the oscillation of the pendulum, by working them out backwards they can also be employed to illustrate the general perspective of these very theories to laypeople, especially considering that contemporary theories of the working of markets (of goods as well as financial) are beyond the understanding of non-specialists because of their highly technical character. One of the team (Besomi) has already published a series of 15 popularizing articles on 'metaphors for crises'[29] in a weekly magazine in Ticino, each describing the changing meanings associated to the metaphors of waves and tides, storms, explosions, earthquakes, unsteady foundations of prosperity, gambling and lotteries, vortices, natural selection and the weeding out of bad plants, comets and eclipses, the pendulum, and diseases. Readers welcomed the series precisely because the articles enabled them to figure out the fundamental view behind the various (and changing) explanations of the phenomena.

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[29] These articles (in Italian) were the complements to a previous series on "the semantic of crises", explaining the origin and meaning of terms such as crisis, distress, panic, bubbles, stagnation, depression, cycle, recession, and economic fluctuations. Both series can be downloaded from the same web page http://www.danielebesomi.ch/diagrams/Cicli_e_crisi/

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