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Article

On two recent attempts to introduce animal spirits in macroeconomics: Heresy or enlightened church reform?

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Abstract:

As noted by Alan Greenspan in 2008, one key flaw in standard models is that they treat animal spirits as a simple 'add factor' rather than as a structural one. This paper evaluates the extent to which two recent approaches placing the emphasis on animal spirits – namely Farmer's 'Neo-Paleo-Keynesian' (NPK) project and Akerlof and Shiller's behavioural approach – manage to overcome this flaw. By following the powerful religious metaphor introduced by Farmer, according to which general equilibrium theory underlying standard models should be regarded as a 'church', this paper stresses two points. First, animal spirits turn out to be devilish features that are inconsistent with the church's commandments. Second, by trying to reconcile them with the church, these two approaches are unable to truly reform it as required by Greenspan; rather, they appear to be heretical stances that are forced to violate some fundamental dogmas of the church.

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In the aftermath of the Great Recession (GR), several economists stressed the limitations of standard DSGE (Dynamic Stochastic General Equilibrium) models.[1] One key limitation was underlined by Greenspan (2008, italics added), according to whom such models are unable to accommodate 'animal spirits' as a true 'explanatory variable':

> Current practice is to introduce [...] 'animal spirits' [...] through 'add factors.' That is, we arbitrarily change the outcome of our model's equations. Add-factoring, however, is an implicit recognition that models [...] are structurally deficient; it does not sufficiently address *the problem of the missing variable*.

Such remarks pose a formidable challenge to macroeconomists: in order to improve business cycle analysis their models should accommodate animal spirits as a structural factor.[2]

[1] See, for example, the contributions to the *Rebuilding Macroeconomic Theory Project* in Vines and Wills (2018).
[2] Greenspan follows Keynes's view of animal spirits, according to which they are an 'innate' or spontaneous human feature, such as instinct or sanguine temperament: "Most, probably, of our decisions to do something positive, the

In this regard, a major question arises: is this really a feasible task? One way to answer it is to assess the research strategies pursued by two important current approaches – namely, Farmer's Neo-Paleo Keynesian research programme (Farmer, 2014; 2016) and Akerlof and Shiller's behavioural approach – which, albeit criticising standard models, seek to achieve this goal by amending rather than rejecting the dominant approach completely.[3] On one side, Farmer seeks to introduce animal spirits in the hard core of general equilibrium theory by arguing that the latter is like a 'broad church',[4] in which animal spirits coexist with the orthodox principle of individual rationality. On the other, Akerlof and Shiller, while rejecting this coexistence, broaden economic analysis by endogenizing animal spirits in terms of psychological and neurological factors along the lines of standard methodological individualism (see, e.g., Akerlof and Shiller, 2009).

By relying on the Lakatosian research program (RP) notion, which is advocated by Farmer himself as a useful heuristic tool, and sticking to his powerful religious metaphor, this paper's contribution is to call into question the ability of these approaches to meet Greenspan's challenge. First, contrary to Farmer's 'broad church' argument, they underestimate the tight 'discipline' to which, exactly like the Catholic Church, the neo-Walrasian RP is committed:

full consequences of which will be drawn out over many days to come, can only be taken as a result of animal spirits — of a spontaneous urge to action rather than inaction, and not as the outcome of a weighted average of quantitative benefits multiplied by quantitative probabilities" (Keynes, 1936, p. 161). As we shall see in what follows, the two approaches discussed in this paper depart from this view. While Farmer regards animal spirits as "self-fulfilling beliefs or confidence", in Akerlof and Shiller's broader perspective, they appear as the flip side of individual rationality, as they consist of several 'failings' of a moral or cognitive character. In particular, as Farmer points out in his effective summary of Akerlof and Shiller's stance, their broad definition includes five things: "(1) confidence (beliefs about what will happen can independently influence outcomes); (2) fairness (wage setting depends on concerns for what others receive); (3) antisocial behavior (some bankers are criminals); (4) money illusion (people are confused about money prices versus real prices); and (5) stories (people believe what friends and the media tell them)" (Farmer, 2009, p. 357).

[3] Both approaches can be regarded as part of the process that Roncaglia (2019, chapters 10 and 11) describes as 'weakening' of the basic paradigm of mainstream economics. In particular, they share an interesting property with other emerging subfields or approaches of contemporary mainstream economics, which has been well captured by D'Ippoliti (2020), as follows: namely, being, "'at the frontier of research' they *take the liberty* of innovating by changing a number […] of features" (p. 47; my emphasis) of the basic paradigm. D'Ippoliti (2020, p. 46) also provides an effective summary of the core of this paradigm:

> Concerning ontology, the assumption that the social world is closed and divisible; that is, it can always be analysed by separating out elements to be included in a formal, often mathematical, model, which may allow for calculable risk but not for uncertainty;
> Concerning method, the assumption that social phenomena are best understood starting from the individual (methodological individualism) and that aggregate phenomena are the sum of individual components;
> Concerning theory, the assumptions that there is an exogenously given scarcity of resources, and it is binding (human wants are always greater than the available resources are able to satisfy); people are different for exogenous reasons (heterogeneity); they have given and stable preferences, and these are the only rationale of agency; they are informed and rational and make decisions on the basis of cost-benefit analysis (utility maximization or cost minimization); choice is the only cause of behaviour, all interpersonal interactions can be seen as contracts bargained in competitive markets; and in all (really existing or supposed) markets, equilibrium prices are determined by the equality of the quantities demanded and supplied, and no exchange takes place outside of this equilibrium.

The key issue addressed by this paper concerns whether the 'liberty' taken by authors like Farmer, Akerlof and Shiller is truly effective; namely, whether their departures from this core of mainstream principles are able to generate a truly *alternative* macroeconomics.

[4] In particular, Farmer argues that the current DSGE approach "is a very broad church that includes models which a purely Walrasian theorist might refer to as disequilibrium. Equilibrium, like beauty, is in the eye of the beholder" (Farmer, 2017a, p. 174).

namely, quite rigid commandments and a pope (in the shape of the Arrow-Debreu model, ADM hereafter), which reduce the range of features that it can treat as 'structural.'

Secondly, there is reason to regard these authors more as brave heretics proclaiming something to be true that is incompatible with church *dogmas* than as enlightened reformers taking issue with church *practices*. Like Luther, these authors try to be reformers: just as Luther sought to castigate the corruption of high priests, they castigate the bad practices – intellectual corruption or 'snake oil' – of current mainstream macro models based on the ADM. While Farmer, for example, castigates Lucas's formulation of rational expectations for its reliance on 'magician's tricks' (see, e.g., Farmer, 2017a, pp. 176-7), Akerlof and Shiller castigate the mainstream for explaining fluctuations in terms of changes in fundamentals, such as technological change, rather than in terms of people's actual beliefs (see, e.g., 2009, p. 4). Like Luther, they would like to restore some old benchmark of 'purity' to allow them to improve macroeconomists' practices: i.e., build better models. However, what undermines their reformist plans is that, unlike Luther advocating going back to the original spirit of the Bible, they fight for less clear-cut ideals.

On one side, Farmer wants to reform the Church by developing new formal models, including animal spirits, inspired not by the ADM formalized in the 1950s but by Hicks's important 1939 book, *Value and Capital*. However, his stance is a form of heresy because it amounts to calling into question the dogma of the (current) pope's infallibility; Hicks is not Jesus but only a former pope. On the other side, Akerlof and Shiller advocate church reform by focusing on how real-world agents deviate from the commandments fixed by the Bible and formalized by the ADM itself, and how economists may help them to rid themselves of illusions or sinful experiences. But this approach also represents a form of heresy. Not unlike the Cathars in the Middle Ages, who regarded the 'flesh' as illusion and worshipped God only as pure spirit, Akerlof and Shiller reject the descriptive value of the ADM as defended by standard macroeconomists, for whom, generally, real people 'get it right' and their views converge on the predictions generated by the theory inspired by the ADM itself.

In order to discuss these issues, this paper is organised as follows. Section 1 analyses the commandments of general equilibrium theory. Section 2 shows why animal spirits are in contrast with them. Section 3 discusses Farmer's heretical stance. Section 4, finally, focuses on Akerlof and Shiller's heresy.

1. The commandments of general equilibrium theory

In this section, I explain the basic features of general equilibrium theory (GET), which is widely regarded as the most successful RP in macroeconomics (also labelled as neo-Walrasian RP).[5] Following Farmer, I will regard this standard RP as a 'church'. I suggest that this religious metaphor is something more than a rhetorical flourish and is actually very useful in improving understanding of the current status of macroeconomics, where one can see the strong resilience of the mainstream paradigm; in particular, there is no significant revival of Keynes's *General Theory* or development of alternative methods capable of challenging the dominant

[5] As Leijonhufvud remarked, this is the 'best' RP in town (see ibid., 1976, p. 86). A similar claim is made by Pasinetti, according to whom the ADM represents the "most clearly formulated economic theory so far" (1999, p. 11). Leijonhufvud provides a very useful step-by-step reconstruction of the dominant neo-Walrasian RP. For a recent reassessment, see e.g. Togati (2019).

DSGE models, despite their clear limitations as revealed by the recent Great Recession and the current coronavirus crisis (for interesting analogies between economics and religion, see Davis, 2014, and Rapley, 2017).

Most importantly, it can be argued that both the neo-Walrasian RP and the Church are complex, hierarchical constructions, that display some remarkable common features, such as 'internal strength' and capability of resisting or opposing dissent and pluralism. In particular, they are based on a similar 'act of faith'[6] which glues together a number of principles of their core or 'untouchable deep doctrine' (Davis, 2014, p. 495) and makes it very difficult for critics who call into question just one or two specific features of such constructions to actually win the day.

1.1. The RP notion

To make this point clear, let me start by recalling two basic features of Lakatos's RP.[7] On the one hand, it provides a neutral benchmark for 'internally consistent' theorising:[8] it suggests that, in principle, all 'good' theories should possess various distinct parts, organized in a hierarchical manner, comprising the following distinct parts:

- a 'hard core' including three types of claims: a) metaphysical principles that cannot be refuted in the light of empirical evidence; they underlie what Leijonhufvud (1976) called 'cosmological beliefs', which embody the 'vision' of the economy; b) the postulates needed to 'defend' the cosmological beliefs; c) high-level methodological claims;
- a 'protective belt' (i.e., more specific models, which may be subject to empirical analysis, and methodologies);
- and 'heuristics' (i.e., instructions on how to carry out research).[9]

On the other hand, the RP concept has a holistic nature: namely, it implies that all parts must be considered together. As we see below, this feature highlights two advantages of the RP concept with respect to looser concepts, such as Kuhn's 'paradigm'. First, it considers *all* the various sides of the mainstream approach, which are often singled out separately in the literature, in the light of various authors' specific research interests.[10] Second, it shows the 'structural' limitations of economists like Farmer, Akerlof and Shiller, who seek to construct

[6] In his interesting paper "How economics became religion", John Rapley holds, for example, that the "moral code [of economics] promises salvation, its high priests uphold their orthodoxy. But perhaps too many of its doctrines are taken *on faith* […]. *The hubris in economics came from a false conviction. The belief that theirs was a science. It neither is nor can be one, and has always operated more like a church*" (2017; my emphasis).

[7] For a summary of the basic features of Lakatos's RP, see e.g. Hands (2001, pp. 295-296); Weintraub (1985).

[8] As noted by Roncaglia (2005), in line with post-positivist philosophy, the RP concept shifts the focus from 'objective' standards for evaluating theories indicated by logical positivism, such as that "theoretical assumptions correspond to empirical reality' and ''logical consistency' to 'more complex' standards revolving around 'internal consistency': 'the acceptance or rejection of a scientific research programme is […] considered by Lakatos a complex process, and not an act of judgement based on a crucial experiment, or in any case on well-defined, univocal, objective criteria" (2005, p. 8).

[9] In particular, 'positive heuristics' focuses on beliefs about how the theory should be developed, while 'negative heuristics' identifies the moves that theory forbids.

[10] For example, heterodox theorists disagree on which side should be regarded as the truly distinctive feature of the mainstream approach. For Roncaglia (e.g., 2019, p. 23) this is represented by the utility value theory based on demand and supply mechanisms rooted in the archetypical image of medieval fairs, while for Hodgson (2019) it is the utility maximization assumption that plays this role. Lawson (e.g., 2003) instead underscores standard theorists' commitment to mathematical-*deductivist methods.*

alternative approaches simply by changing a few basic assumptions or building new models.[11] However, such limitations will appear even more pronounced in the light of the religion metaphor, which has the merit of clarifying the reasons of the actual strength of the mainstream RP. In order to discuss this metaphor in greater detail, in the following sections I will show that on each of the RP features listed above what we find in GET has a plausible counterpart in the Church's domain.

1.2. Cosmological beliefs

The first layer of the hard-core claims of the neo-Walrasian RP is constituted by 'grand generalities', such as metaphysical or ontological beliefs about the economy, which Leijonhufvud labels as 'presuppositions' or 'cosmological beliefs'. He underlines that such propositions cannot be inferred from formal models: "[…] these will – if ever made explicit – be less precisely, more informally stated" (ibid., p. 72). The most significant cosmological beliefs concern key features of the real-world economy, such as the following.

A. Stability

Leijonhufvud stresses that to establish the link between theory and the real world the use of metaphors such as the 'invisible hand' or Wicksell's 'rocking horse' is crucial. These metaphors are a way of expressing belief in the internal stability of a decentralized market economy, namely the view that the interaction of autonomous agents produces 'optimal' equilibrium: 'a market economy is a self-regulating (or "equilibrating") system' (ibid., p. 80), as well as the belief that the economic system is capable of absorbing external shocks; that is, that it exhibits 'strong tendencies to converge relatively rapidly to the equilibrium values of its 'real' variables' (ibid., p. 71).

A first key link between GET and the Church's domains can be noted here. At the root of both is a similar act of faith. Just as religious people believe in the existence of God, standard theorists believe in the internal stability of the economy. As pointed out by Leijonhufvud, the use of the invisible hand or the rocking horse metaphor indicates a 'belief that one treats as indubitable for doing equilibrium analysis – an activity which otherwise would be merely an intellectual game' (ibid., p. 80; my emphasis). In other words, in GET stability is not an analytical claim; it is a metaphysical premise that one cannot demonstrate but must just take for granted.

[11] Indeed, most economists focus on models as stand-alone constructions rather than research programmes. For example, Rodrik's recent book on 'economic rules' concerns only the ways economists should use particular models; it simply does not mention similar rules for 'paradigms' or RPs. This is not an oversight. Rodrik clearly dismisses 'paradigm thinking' as a hindrance to understanding because of its tendency to formulate misleading 'universal' theories. In contrast with what I argue here, he holds that theories simply consist of a collection of particular models (see, for example, Rodrik, 2015, chapter 4).

B. Value

Equilibrium on all markets occurs thanks to the smooth working of the price system. Prices are formed according to a theory of value based on the concepts of scarcity and utility.

C. Self-interested agents

Prices govern the interaction of autonomous agents, each seeking to pursue their self-interest. More specifically, flexible prices – in a fully competitive context – manage to coordinate agents' interaction successfully so that one can meaningfully talk about a 'general equilibrium system', which many economists regard as having a unique role in economics, not unlike the belief that 'God is one' in religion: namely, for them GET appears as being nothing short of 'the' system of the world (Samuelson, 1952)[12] or the "Magna Carta of exact economics" (Schumpeter, 1954, p. 968). [13]

1.3. Postulates

The second layer of the hard core of the neo-Walrasian RP is made up of 'postulates' or axioms. Before examining the contents of such postulates in some detail, let us briefly discuss the reasons why reference to postulates becomes inevitable in both economics and religion. They have mainly to do with 'defence' of the cosmological beliefs that are broad and open to controversy.[14] It is clear, for example, that, in the Catholic religion, one thing is the apparent simplicity of the Holy Scriptures and the Commandments inspired by God and another is their interpretation within the community of believers in real world contexts, which necessarily generated controversy over fundamental issues, such as the nature of Jesus Christ or the Holy Trinity. In the course of time, one of the Church's defences against such divisive controversy – which eventually emerged – was to declare the pope's 'infallibility.[15] The same is substantially true for GET. Indeed, like religious beliefs, economic cosmological beliefs are also potentially very controversial; this explains why, after quite a long story, well described by Weintraub

[12] Samuelson noted that, like Newton, Walras 'was the man of genius *par excellence*, but … he was also the luckiest: one finds only once *the* system of the world to be established' (1952, p. 1756; my emphasis).
[13] In other words, this means that, for mainstream macroeconomists like Lucas, GET is not just the best RP but also the 'true' model of the economy or 'the only game in town', its 'truth' or validity being obvious. This is well captured by Roncaglia, as follows: "Axiomatic general equilibrium theory has been considered by many, possibly the majority of mainstream economists, as the frontier of basic research in the field of economics. The label 'general', in particular, has been used not simply in the original meaning of 'inclusive of the totality of the economic system in its interrelations', but also, implicitly if not explicitly, in the meaning of *compulsory* reference for *any* economic inquiry" (2005, p. 348; my emphasis). As I suggested in a recent paper (see Togati, 2021), Lucas's 'true model' claim is certainly not rooted in spontaneous, unanimous consensus (among peers) based on genuine scientific prestige, comparable say to Einstein's relativity insight, due to basic flaws in the standard RP, such as its failure to accommodate money and expectations on the grounds of 'first principles' underlined by Hahn (1982). To emerge as the 'only game in town', the neo-Walrasian RP actually needs institutional features, such as research funding, scientific journals and academic careers, to support this view forcefully. Such features are discussed by Akerlof (2020) and D'Ippoliti (2020).
[14] As Leijonhufvud puts it, "The 'Maximizing behaviour postulate' [is …] an important link in the boundary *defences* of economics" (ibid., p. 75; my emphasis).
[15] According to this theory, the pope enjoys, by divine institution, a supreme power in the care of souls.

(1985) in particular, something similar to the pope's infallibility finally emerged as a major defence in GET, namely the supremacy of the ADM, which lays out the canonical postulates, the 'true' grammar of modern macroeconomics. As Weintraub explains, this model represents the final stage of the process of 'hardening' of GET's hard core, which means that the latter is no longer a matter of controversy.[16]

According to Weintraub (1985, p. 109), the postulates included in the ADM are the following hard-core propositions:

HC1 There exist economic agents
HC2 Agents have preferences
HC3 Agents independently optimize subject to constraints
HC4 Choices are made in inter-related markets
HC5 Agents have full relevant knowledge
HC6 Observable economic outcomes are coordinated, so they must be discussed with reference to equilibrium states.

For the purpose of this paper, which focuses on macroeconomics, I simplify this list by including HC1 among the cosmological beliefs and by grouping the other propositions in such a way as to single out only three fundamental postulates: first, the postulate of 'atomism' which defends HC1 – namely the primacy of self-interested individuals in mainstream economics – by assuming that they act independently to maximize some objective functions and which thus incorporates HC2, HC3, and HC5; secondly, the 'equilibrium' postulate, or the commitment to the study of equilibrium states, which corresponds to proposition HC 6; thirdly, the 'constructive method', a requirement that explanations be couched solely in terms of individuals, which is reflected in HC4.

Based on such postulates, the ADM formalizes the mainstream vision of the economy.[17] In particular, by assuming the existence of a complete set of markets (for all commodities on all dates and with all contingencies), it formally expresses the key hard-core presuppositions – internal stability, utility theory and the role of individual agents – which allow one to single out unambiguously the 'drivers' of standard analysis, namely the so-called 'deep parameters' – individual preferences (assumed to be stable) and resources (such as technology and amount of labour and capital) – which account for the existence of equilibrium in all markets. Although, in general, the ADM allows for multiple equilibria, it can generate a unique equilibrium if extra assumptions on consumer preferences are added.[18]

[16] "It is my contention that the sequence beginning with the Schlesinger paper and continuing through those of Wald, von Neumann, Koopmans, Arrow, Debreu, and McKenzie should be recognized as a hardening of the hard core of the neo-Walrasian program […]. The hard core as presented can be said to have existed only as early as the early 1950s. The recognition that Arrow, Debreu, and McKenzie had accomplished a major feat was precisely the recognition that the hard core of the neo-Walrasian program was, by their work, no longer problematic" (Weintraub, 1985, pp. 112-113; original in italics).

[17] Unlike cosmological beliefs, insofar as they are directly inferred from formal models these postulates are 'precise'. In other words, according to Leijonhufvud, to pass from 'cosmological beliefs' to 'postulates', one needs a formal language of representation, capable of ordering perceived economic realities and defining variables and primitive terms.

[18] In order to achieve uniqueness and stability of equilibrium, consumers' utility functions must be strongly concave and twice continuously differentiable; see, for example, Bisin (2014); Levin (2006). As I argue below, these restrictions are heuristic assumptions that are needed to derive simple macro models from the ADM.

1.4. 'High level' methodological claims

The third layer of the hard core of the neo-Walrasian RP is made up of 'high-level' methodological claims, such as the need to rely on 'models'. It should be noted that, when dealing with this issue, it is difficult to avoid an overlap between hard-core claims concerning models in general and 'lower-level' claims concerning more specific models in the protective belt. In this section, however, I will focus on those aspects of model building that in my view belong to the hard core, because they should not be controversial for economists subscribing to the neo-Walrasian RP. I will discuss what I regard as more controversial aspects in the next section.

Once again, I start by noting that there are important reasons why both economics and religion use models and these are based on similar 'acts of faith'. On one side, all religious education teachers manage to illustrate the basic principles of the Church by relying upon metaphors or parables that work like models or simplified representations of the Bible, aiding understanding of some of its most difficult passages or meanings or overcoming psychological barriers to learning. While different parables are contained in the Bible itself, or may be invented or used by different people, all have the same properties. More precisely, to work as simple models of the Bible they must be rooted in its key hard-core beliefs and must therefore contain nothing that contradicts them.

On the other side, as Leijonhufvud points out, the rocking horse metaphor also helps clarify key aspects of the standard method; namely the ultimate presuppositions (which Leijonhufvud considers 'acts of faith') that guide study of the economy following GET principles. An obvious presupposition is that 'there exists a horse'. A 'horse' is a way of expressing the reliance of economists on 'models'. Since the incorporation of all relevant external factors into a systematic theory is beyond reach, in order to deal with evolving economic systems economists are compelled:

a) to classify relevant explanatory factors into endogenous/exogenous variables;
b) to decompose the economic system into autonomous subsets (for example, monetary/real sectors);
c) to construct a model of the economy explaining its response to any given external shocks;
d) to regard the economy as a self-contained subset isolated from society; from this point of view, economics is separate from sociology and follows an 'internalist' logic.

While different models may be invented, all have the same general properties. In particular, macroeconomic models based on GET must work as 'simple' representations of the ADM because the latter is too abstract and independent from any interpretation to generate useful theoretical claims or policy conclusions directly.[19] This means that such simple models must be rooted in the key hard-core beliefs of the neo-Walarasian RP and must therefore contain nothing that contradicts them. In particular, economists taking the ADM as the key benchmark for macroeconomics should not quarrel about heuristic simplifications – such as

[19] As Debreu himself clarifies, in his book: "The theory of value is treated [...] with the standards of rigor of the contemporary formalist school of mathematics. The effort towards rigor substitutes correct reasoning and results for incorrect ones [...] leads to a deeper understanding of the problems to which it is applied [...]. Alliance to rigor determines the axiomatic form of analysis where the theory, in the strict sense, is logically disconnected from its interpretation" (1959, p. x).

that agents' expectations are rational[20] and that equilibrium is unique and stable, as well as the use of the representative agent device[21] – needed to make a smooth transition from the hard-core abstract ADM world – where fluctuations can simply not occur due to the complete market hypothesis – to simplified macro models in the protective belt helpful to draw practical conclusions. The point is that these are only 'technical' assumptions that orthodox macroeconomists have been forced to adopt in order to build such models. In other words, they should not be controversial because they are not the theory itself, but only what makes its streamlined representation possible. Indeed, without them, there could be no orthodox macroeconomics at all.

1.5. Protective belt and heuristics

As noted above, the other two parts of the neo-Walrasian RP concern its 'protective belt' (i.e., more specific models, which may be subject to empirical analysis, and methodologies) and 'heuristics' (i.e., instructions on how to carry out research). Once again, I start by pointing out broad similarities between economics and religion within these issues. A major point is that, in both fields, the elimination of controversy from the hard core of fundamental metaphysical claims – either through the pope's infallibility dogma or through axiomatization – implies not that there is no room for alternative interpretations of the Bible or economic issues but rather that controversy should be transferred to a pragmatic area. On one side, true controversy in the Church revolves around the ways in which believers should behave in order to carry out 'virtuous' or moral decision-making in real-world life. For example, there may be different 'instructions' on how to avoid the forms of behaviour that may lead a person to commit the so-called cardinal sins, which involve breaches of the Commandments.[22] On the other side, true controversy among orthodox macroeconomists revolves around the way research or model-building should be carried out in light of the 'first' principles, described by the neo-Walrasian RP. Strictly speaking, this RP provides quite clear-cut instructions on how mainstream economists should behave in order to avoid committing what might be labelled as 'researchers' cardinal sins', namely those approaches or forms of theorizing that cause breaches of its basic postulates. Such instructions are summarized by Weintraub in his list of propositions describing the positive (PH) and negative (NH) heuristics of the neo-Walrasian RP (ibid., 1985, p. 109):

PH1. Go forth and construct theories in which economic agents optimize.
PH2. Construct theories that make predictions about changes in equilibrium states.
NH1. Do not construct theories in which irrational behaviour plays any role.

[20] It should be noted that, to work as a link between the ADM and the real world, rational expectations cannot simply be 'correct' expectations, whatever their substantive content; they also imply that agents form expectations on the grounds of the standard model itself.
[21] The representative agent device is justified as necessary simplification to build a simple, unified picture of how the system as a whole works; it implies that structural differences in terms of fundamentals like preferences, income, age, i.e., rich-poor, young-old, born-unborn, do not matter in the aggregate thanks to the stochastic approach, which is able to convert 'empirical' deterministic heterogeneity into 'theoretical' homogeneity. Researchers may well try to model heterogeneity, but what matters is that such models do not affect the view defined by the hard core of GET, that agents are alike at a fundamental level, in particular that they are all maximizers.
[22] Such differences exist because there are many dimensions of morality and because people's understanding of it has developed through time (see, for example, McBrien, 1994).

NH2. Do not construct theories in which equilibrium has no meaning.
NH3. Do not test the hard-core propositions.

It can be argued that this set of instructions allows us to single out two sources of controversy between macroeconomists. The first is the one between mainstreamers and 'heretics': while the former follow such instructions closely, the latter simply do not. The second type of controversy arises within the mainstream itself. The point is that the key heuristic principles may be applied in different ways according to whether one interprets the role of the ADM in 'positive' or in 'negative' terms. This point can be clarified by considering how different mainstream approaches answer the following question: should we take the models derived from the ADM as fully descriptive of actual economies? Monetarists or real business cycle theorists respond affirmatively: they regard such economies as being in continuous full employment equilibrium and thus simply dismiss demand policies as a matter of principle.[23] In contrast, mainstream new Keynesians respond negatively: in their view, such models can be used to understand why such economies may – on occasion and for specific markets – fail to work smoothly and thus justify more activist demand policy stances.[24]

In both camps, while sticking to the basic heuristic principles of the neo-Walrasian RP, economists have various options as to what types of shocks or imperfections should be incorporated in standard models.[25]

2. Animal spirits as devilish features

On these grounds, one sees why animal spirits as defined by the authors considered in this paper can only find room in the neo-Walrasian RP as ad hoc factors. More specifically, following

[23] For these theorists, this means not that their models correctly describe all real-world phenomena but rather that they capture their 'essential' or 'normal' features, including cyclical co-movements and growth accounted for in terms of first principles.

[24] This distinction corresponds to that between 'freshwater' and 'saltwater' economists, summarized by D'Ippoliti (2020, p. 50) as follows:

> mainstream economics departs from the premise that the market functions well in its idealized benchmark model. It then splits up into either a 'freshwater' front, for example, New Classical macroeconomics, which assumes that the idealized model is more or less applicable to reality, and a 'saltwater' front, which considers a collection of instances in which it does not.

[25] A New Classical macroeconomist like Ohanian (2010, p. 48) stresses, for example, that further progress in business cycle theory can be made by shifting the focus from analysis of simple exogenous or 'abstract' shocks to investigation of their 'nature' and 'source':

> The literature on general equilibrium business cycle models has made considerable progress in understanding how different model economies respond to what we call *abstract shocks*: shocks that do not have a precise definition or acknowledged source. This category includes productivity shocks, preference shocks, financial shocks, risk shocks and markup shocks, among others. However, because the focus of the literature has been on studying the effect of different types of shocks in different types of economies, there has been less progress on developing and testing theories about the nature and sources of these abstract shocks.

On the other hand, new Keynesians face the choice which is effectively described by D'Ippoliti (2020, p. 50) as follows:

> Mainstream economists who want to say that the market produces inefficient results…must either conjure some limitations on the side of the individuals, such as bounded rationality, or they must come up with some 'market failures', such as transactions costs or information asymmetry, so that, even if in principle competition would still produce an efficient result, in the specific case under study, it will not.

our religion metaphor, animal spirits turn into a devilish feature that is inconsistent both with the hard core of this RP and/or its heuristic principles.

We can begin by noting that there are at least three reasons why animal spirits, seen by Farmer as 'self-fulfilling' beliefs or confidence (rather than the 'innate' or spontaneous human features emphasized by Keynes) clash with the basic postulates underlying the ADM. First, when adopting Farmer's definition in a macroeconomic context based on the use of aggregates and reference to a high number of heterogenous agents, the nature of animal spirits appears to be inconsistent with the postulate of atomism. As noted, for example, by Major, they imply that 'economic decision-making is intersubjective, based on actors' expectations of others' expectations (Major, 2009, pp. 371-2; see also Best, 2004). What leads agents to seek support for their own decision-making in other agents' opinions and thus influence each other in drawing negative conclusions about the economy as if they are members of a ship's crew? The most likely answer is that there must be some sort of serious information imperfection in sharp contrast with atomism. Indeed, this postulate – according to which, at any single instant in time, agents are autonomous and rational decision-makers in a *substantive* sense, capable of maximizing utility over alternative life courses[26] –makes sense only if agents have full knowledge of all available options. More specifically, there are two basic reasons why in the ADM – and closely related theoretical stances such as the Chicago school – agents' decisions are not influenced by the context. On one side, 'commodities are restricted to market goods without social or ethical aspects' (McFadden, 1999, p. 78). On the other, the perfect competitive assumption underlying the ADM implies that market prices are all agents need to know for their choices and that they can get this information without referring to other agents' views.

A second reason why animal spirits clash with the basic postulates underlying the ADM is that animal spirits cannot, as Farmer claims, play an autonomous role in GET on a par with other fundamentals. This is because they clash with the constructive method based on the principle of methodological individualism, according to which social scientists should seek to understand macro outcomes and phenomena, including expectations, collective beliefs and money, as the result of the interaction of individual optimizing atomistic agents – a principle that has inspired every micro-foundation move since the publication of the *General Theory*. If one accepts this view, then self-fulfilling beliefs cannot really be *autonomous* with respect to the fundamentals, such as agents' preferences, as Farmer's RP implies; rather, they must be reduced *to them*. Assuming instead that investors' beliefs play an autonomous role in the analysis amounts to subscribing to a 'holistic' approach, according to which collective entities are irreducible features. It is an approach which ends up calling into question the primary causal role of GET's true fundamentals (the latter can no longer be so, if other factors can act as the main characters in the play).

Thirdly, animal spirits cannot play an autonomous role in GET, partly because they contrast with the very notion of equilibrium underlying the ADM. This notion has two characteristics. First, it accounts for the 'normal' state of the economy as determined by its deep or 'essential' drivers: the fundamentals generating prices and quantities. Other factors, such as money, expectations and animal spirits, are not part of the model insofar as they are 'phenomenological' and can be ignored insofar as they are unable to influence this normal

[26] "A commodity is a good or a service completely specified physically, temporally, and spatially. For any economic agent a complete plan of action *made now for the whole future* is a specification for each commodity of the quantity that he will make available or that will be made available to him" (Debreu, 1959, p. 32).

state, in which there is no room for crises and other pathologies.[27] Secondly, as already noted, under particular conditions of a formal kind (such as restrictions on consumer preferences), equilibrium can be shown to be unique and stable. This means that, from the 'analytical' or 'theoretical' point of view, it is possible to demonstrate the existence of a unique link between the set of fundamentals and equilibrium outcomes. While it is true that, generally speaking, there can be a lot of Walrasian equilibria for a given specification of preferences and endowments, the possibility of multiple equilibria in this context appears to be only a 'mathematical' result (that is, linked to an absence of restrictions on consumers' preferences). In other words, the given set of fundamentals may generate either multiple equilibria or a unique equilibrium according to specific mathematical properties.

On the other hand, there is no doubting that Akerlof and Shiller's animal spirits, seen as 'failings' of a moral or cognitive character, also appear to contrast with the neo-Walrasian RP. More specifically, they violate its key heuristic principles, thus leading these authors to commit various cardinal sins, such as rejecting hard-core metaphysical principles (e.g., rationality) on the grounds of evidence concerning people's actual behaviour and constructing theories based on agents' irrational behaviour rather than optimization and equilibrium states.

Given this inconsistency between animal spirits and the neo-Walrasian RP, how can Farmer's NPK agenda and Akerlof and Shiller's behavioural approach – which still retain a strong link with this RP – be justified? To answer this question, let us now focus on these approaches in some detail in the light of our religion metaphor.

3. Farmer's heretical stance

3.1. The critique of bad practices

I suggest that this metaphor actually provides a concise but hopefully deep understanding of the apparent 'mission impossible' that characterizes Farmer's NPK agenda, namely his attempt to insert animal spirits in the hard core of the standard macro RP rather than treating them simply as an 'add on' feature.[28] In particular, it shows that Farmer most closely resembles Luther: despite iconoclastic overtones, he keeps believing in God but does not like the current state of the Church. He advocates the reform of practices – new heuristic devices – because the current ones, such as the representative agent device, rational expectations and unique equilibrium, turn out to be corrupt, dirty tricks.[29] He believes that current authorities – the

[27] In other words, it should not be surprising to find that, as noted by Frank Hahn, there is no room for money in the ADM: "The most serious challenge that the existence of money poses to the theorist is this: the best developed model of the economy cannot find room for it" (1982, p. 1).

[28] For this reason, Farmer's NPK agenda in principle represents an important step forward with respect to an extensive existing body of research, developed over the last 35 years, that integrates sentiment, news, self-fulfilling expectations and uncertainty shocks into otherwise neoclassical models and produces Keynesian results thanks only to the introduction of ad hoc features, such as trading frictions (for example, Angeletos and La'O, 2013) or informational imperfections (for example, Benhabib et al., 2015).

[29] It is important to recall the difference between 'heresy' and 'blasphemy'. While heretics keep believing in God but disagree with important Church dogmas or practices, blasphemous people instead reject the very existence of God. Following our analogy between religion and GET, this distinction captures the difference between, on the one hand, Farmer, Akerlof and Shiller, who call into question some aspects of GET but retain its key internal stability assumption, and, on the other hand, economists – including, in my view, Keynes himself – who reject the whole GET approach. In this paper, there is no room for dealing with Keynes's blasphemous stance and how it departs from the heretical approaches discussed here. For a recent discussion of such issues, see Togati (2020).

ADM and high priests like Lucas – are ultimately responsible for this bad state of affairs;[30] his reformist project amounts to going back to a kind of pristine, original Bible:, Hicks's Value and Capital (VC).

3.2. Going back to the original Bible

The key reason why Farmer refers to VC is that it seems both closer to the original spirit of pioneers of the discipline like Keynes and Pigou and – insofar as it lacks the full set of markets and refers to simple temporary equilibrium – much less demanding than the canonical ADM (Farmer, 2017a, p. 174):

> I do not think that the a-temporal, Walrasian fiction of complete financial markets is the right approach. There clearly was no grand market meeting at the beginning of time in which we all traded date-, location- and state- specific commodities into the infinite future. A more reasonable starting point, in my view, is the temporary equilibrium framework constructed by Hicks in *Value and Capital.*

The key analytical purpose for resurrecting Hicks's approach is that it succeeds in justifying the role of aggregate demand in GET (ibid., p. 174):

> In Hicks' framework, market participants come together in a weekly market meeting to trade commodities. The current week is linked to past weeks through stocks of capital goods and financial assets that the participants bring to market. And it is linked to future weeks by the expectations of market participants about future state-contingent prices and future production opportunities. […]
>
> If one agrees to follow this paradigm, one must ask how goods are allocated in each weekly meeting. The Walrasian answer is that prices are adjusted by a fictional auctioneer who ensures that, conditional on the state of expectations, the quantities demanded and supplied of every good are equal. Hicks' answer, developed after reading a draft of the *General Theory*, was that some prices are slow to adjust, and, as a consequence, there may be demand spillovers from one market to another. This is the Patinkin-Clower-Leijonhufvud (PCL) interpretation of *The General Theory.*

3.3. Why is Farmer's RP a heresy?

From the church's standpoint, one can see several reasons for considering Farmer a heretic, as opposed to a Lutheran reformist hoping to achieve true changes. Why? First, unlike Luther, Farmer does not appeal to an unquestionably superior authority; in other words, he seems to neglect that VC is not the Bible and Hicks is not Jesus Christ but, much more modestly, a dead pope.

Secondly, as a member of the church, Farmer does not recognize current papal supremacy, namely the special status of the ADM in deciding what passes for GET. He puts Hicks's temporary equilibrium on a par with it, as if they were two equally plausible formulations of GET, so that theorists can legitimately choose which one fits their stance best. While Monetarists or RBC theorists choose the ADM, Farmer's choice is to use Hicks's framework (together with other models, such as the overlapping generations one).

[30] Indeed, Farmer describes Lucas – who relies upon such heuristic assumptions to start the rational expectations revolution – as a talented illusionist rather than a brilliant scientist: 'Like a good magician who diverts your attention while withdrawing a card from his sleeve, Lucas slipped an assumption into his argument that almost nobody noticed...' (Farmer, 2017a, pp. 176-7). As a consequence, Farmer regards his own contribution as revealing Lucas's 'dirty little secret' (ibid.).

Thirdly, Farmer uses VC as a Trojan horse to relax the strict discipline of the ADM. More specifically, he does so by choosing – not unlike Humpty Dumpty[31] – the meaning of key terms in such a way as to overcome the contrast between animal spirits and GET, as follows.

a) Farmer holds that the introduction of animal spirits to GET is possible 'without giving up on the idea of rational behavior' (Farmer, 2009, p. 357). In his view, rationality does not correspond to Debreu's substantive notion, but appears an innocent formalistic tautology (Farmer, 2017b):

> Rationality means many things to many people and there are both broad and narrow definitions of what exactly it means. Under the broad definition, one that I have always liked, it is an organizing principle that categorizes human action. Rationality means that we always choose our preferred action. What is our preferred action? It is the one we choose.

b) Farmer reconciles animal spirits with a 'weak' notion of rational expectations by interpreting them merely as 'correct' expectations, whatever their content,[32] in contrast with Lucas's holding that they also imply knowledge of the true model of the economy.

c) Farmer's view is that current GET 'is a very broad church that includes models which a purely Walrasian theorist might refer to as disequilibrium. Equilibrium, like beauty, is in the eye of the beholder' (Farmer, 2017a, p. 174). Farmer also reconciles animal spirits with multiple equilibria seen as a theoretical (rather than simply mathematical) result; as outcomes determined by a supposedly broader set of fundamentals, in contrast with the unique equilibrium heuristic assumption underlying standard macro, where equilibrium is unambiguously determined by a narrow set of fundamentals (that is, deep parameters).

In the end, Farmer appears as a heretic in the eyes of mainstream believers because he delivers them an ultimately idiosyncratic message. On one side, he seems to refuse the Bible and advocate apostasy, or even doubt the very existence of God – namely, faith in internal stability – as when he introduces a new metaphor to capture Keynes's view that the system is not self-adjusting (Farmer, 2010, pp. 10-11):

> Keynes had much less faith in the free market. In Keynesian economics, the economy is like a boat on the ocean with a broken rudder. Gusts of wind represent major economic events: a war in the Middle East, a hurricane in the Midwest, an airline pilots' strike. After each shock, unemployment rises or falls permanently and there is no self-correcting mechanism to return it to a unique equilibrium. Just as a sailboat will be becalmed whenever it comes to rest, the unemployment rate can end up anywhere. The classical economists saw the economy as a stable self-correcting system. Keynes did not.

On the other side, he criticizes religious education teachers – namely, mainstream macroeconomists – for adopting wrong parables or simplifications of the current Bible, namely wrong heuristic devices to simplify the ADM.

[31] '"When *I* use a word," Humpty Dumpty said, in rather a scornful tone, "it means just what I choose it to mean – neither more nor less." "The question is," said Alice, "whether you *can* make words mean so many different things." "The question is," said Humpty Dumpty, "which is to be master – that's all."' (Carroll, 1934, p. 205; original emphasis). As noted, Farmer seeks to replace the authority of the current pope with that of a former pope.

[32] "Rational expectations is the idea that you can't fool all of the people all of the time. *Whatever market participants believe* about the future must be consistent, on average, with what happens" (Farmer, 2010, pp. 66-7; my italics).

3.4. Why the new RP will not attract more disciples

It can be argued that, despite his efforts, Farmer's heresy earns him only a Pyrrhic victory, without substantial reformist Lutheran effects. There is no doubt that he is able to construct rigorous, fully worked-out models apparently incorporating animal spirits with all their i's dotted and t's crossed. Indeed, from this formal standpoint, animal spirits and deep parameters – all 'data' in formal models – actually seem to be on a par. However, Farmer's reference to Hicks does not produce any reformist effects on the broader 'structural' issue raised by Greenspan: the point is that, on closer inspection, animal spirits turn out to be inconsistent also with VC. Strictly speaking, it is clear that the latter is quite unlike modern formulations of GET. For example, Hicks does not make a sharp distinction between hard core and protective belt; that is, he relies on 'one-stage theorizing,' in which there is no room for either the complete markets hard core assumption on the one hand and the heuristic rational expectations assumption on the other (i.e., in VC expectations are introduced from the beginning). Moreover, empirical features, such as lagged wage and price adjustments, overlap with abstract thinking: i.e., full equilibrium on Monday (which presupposes fast price adjustment).[33] It is not surprising therefore that, by referring to VC, Farmer manages to sidestep the complex architecture of the contemporary neo-Walrasian RP and seems to gain degrees of freedom with respect to the ADM's strait-jacket. However, there are key reasons why, while apparently relatively flexible, Hicks's framework does not support Farmer's project.

First, VC is a true version of GET, which turns out to be quite in line with the postulates of the ADM itself. Suffice it to note that VC is not just based on a generic view of individual rationality but also crucially advocates a strongly reductionist stance, such as that, in pure theory, there is no room for macroeconomic aggregates, including animal spirits, that are not explained in terms of individual optimizing behaviour. Following the views of economists like Robbins and Hayek, Hicks holds that such aggregates are concepts that the "theoretical economist only employs in his arguments at his peril" (Hicks, 1946, p. 180), for at least two reasons: on one side, they do not exert a direct influence on the decisions of individuals which economic theory focuses upon; on the other, being the product of ordinary language and everyday business life, they are logically imprecise: "There is far too much equivocation in their meaning […]. At bottom, they are not logical categories at all; they are rough approximations, used by the businessman to steer himself through the bewildering changes of situation which confront him" (ibid., p. 171).

Secondly, while implying a lack of markets, Hicks's approach does not allow for informational imperfections that justify animal spirits. He relies on perfect competition, which implies atomistic agents and full knowledge, required for the smooth working of the price mechanism: "our method seems to imply that we conceive of the economic system as being always in equilibrium […]. Nor is it unreasonable to do so. There is a sense in which current supplies and current demands are always equated in competitive conditions" (ibid., p. 131). He also notes that "a general abandonment of the assumption of perfect competition […] must have very destructive consequences for economic theory" (ibid., pp. 83-4).

Thirdly, following this key homogeneity of agents in terms of knowledge, Hicks does not attach any value to agents' empirical heterogeneity, which Farmer relies upon to justify multiple equilibria and the causal role of financial markets and aggregate demand in

[33] As Hicks puts it: "During the 'week' (as I called the single period) production and consumption proceed at prices that are established by trading on its first 'day' (Monday)" (1985, p. 69).

determining income. Indeed, Hicks (ibid., p. 245) himself relies on the representative agent device:

> […] it is one of the most exciting characteristics of (our) method of analysis […] that it enables us to pass over, with scarcely any transition, from the little problems involved in the detailed study of the behaviour of a single firm, or single individual, to the great issues of the prosperity or adversity [...] of a whole economic system. The transition is made by using the single principle […] that the behaviour of a group of individuals, or group of firms, obeys the same laws as the behaviour of a single unit […]. The laws of market behaviour, which we have laboriously elaborated for these tenuous creatures, the representative individual and the representative firm, thus become revealed […] as laws of the behaviour of great groups of economic units.

In the end, while it is true that Hicks ends up by justifying the structural role of aggregate demand in determining income, he does so on the grounds of a key limitation of his single-stage approach – namely the ambiguous overlap between abstract thinking – i.e., full equilibrium on Monday (which presupposes fast price adjustment) – and empirical features – i.e., lagged wage and price adjustment – which later New Keynesians relying on axiomatization and stochastic equilibrium have overcome by clarifying that empirical imperfections of the price mechanism do not stand on the same footing as the hard core 'first principles'. They are therefore quite incapable of justifying the structural role of aggregate demand in GET; they can only account for the slow reaction of the system – defined in structural terms along standard lines and represented by DSGE models – to shocks.[34]

4. Akerlof and Shiller's heretical stance

4.1. The critique of bad practices

The religion metaphor also provides a good understanding of Akerlof and Shiller's behavioural approach. Like Farmer, these authors too, like Luther, continue to believe in God and want to change the church for the better by seeking inspiration from Keynes's *General Theory*. Their reformist proposal is quite simple: macroeconomists should focus upon people's actual sins, especially their mostly erroneous beliefs, which they label as animal spirits, stories or narratives, as Shiller does especially in his 2019 book. They thus castigate the bad practices – intellectual corruption or snake oil – of current mainstream models based on the ADM, which neglect them and explain fluctuations only in terms of changes in fundamentals. As they put it: "The idea that economic crises, like the current financial and housing crisis, are mainly caused by changing thought patterns goes against standard economic thinking" (Akerlof and Shiller, 2009, p. 4). Strictly speaking, as Shiller notes, 'Of course, economists are aware of the narratives associated with events' but they fail to consider them as autonomous causal factors generating such events (Shiller, 2019, pp. 76-79):

> mostly (economists) work on the assumption that the narratives are nothing more than a bit of silliness that follows the discovery of changing real news about deep economic forces […] (presumably caused exclusively by) scientific advances in production, discovery or unexpected

[34] The attempt to regard wage and price rigidities as if they were 'first principles' has led authors of the neoclassical synthesis like Patinkin to rely on static formulations of GET to derive a 'structural' role of aggregate demand through channels such as the real balance effect in the IS-LM and AD/AS models. In contrast, new Keynesians treating such rigidities as protective belt features have dropped such models, which survive only in textbook presentations where ad hoc assumptions, such as the short-run/long-run distinction, are made for pedagogical purposes.

> exhaustion of natural resources, demographic changes […]. But this mode of thinking misses what may be the essential elements that cause change in the economy […] the economic narratives surrounding these events work in predictable ways: they are contagious, they suggest scripts for people to follow, they repeat their messages, and they thrive on human interest. In doing so, they affect society and the course of economic activity in highly consequential ways.

More specifically, Akerlof and Shiller's reformist project involves a U-turn in analytical methods. Unlike standard macroeconomists who rely on a purely deductivist approach based especially on the axioms of substantive individual rationality, Akerlof and Shiller advocate looking inside the black box of animal spirits by developing a rich phenomenology of agents' irrational behaviour in real-world conditions.[35] Indeed, in their view, animal spirits are essentially the flip side of individual rationality, as they consist of several failings of a moral or cognitive character. They stress, for example, that the Great Recession "was caused precisely by our changing *confidence, temptations, envy, resentment and illusions – and especially by changing stories* about the nature of the economy" (ibid., p. 4; my italics).

In particular, Akerlof and Shiller underline that a full understanding of such behavioural features should lead economists to be more open to considering the contribution of 'softer' disciplines:

> In traditional economic theory, motivations come from a priori assumptions regarding what people plausibly maximize. But there is much less restrictive, and more general characterization of the range of possible motivations: that people are motivated though the stories they are telling themselves at the time they make their decisions. In turn, insofar as human thinking can be described as occurring though stories, that means that people are motivated through the stories they are telling themselves. The core of sociology and cultural anthropology is ethnography, whose goal is to uncover and interpret the stories that people are telling themselves. (Akerlof, 2020, pp. 412-413)[36]

4.2. Going back to the original Bible

Like Farmer, Akerlof and Shiller also follow the Lutheran move to restore some old benchmark of 'purity'. It should be noted that – while considering Keynes as our macroeconomic saviour as his policy insights are still useful in curing major evils such as unemployment – the *General Theory* is not their Bible. They regard it as a text denouncing the 'impurities of the spirit and flesh', the myriad of ways in which real-world agents deviate from the commandments fixed by the true Bible, namely the ADM itself. Just as describing the occurrence of sins does not make the existence of God redundant, their definition of animal spirits presupposes reference to the benchmark of full rationality underlying the ADM, which sets the norm of stability or the smooth working of the economy.

The key assumption of Akerlof and Shiller's behavioural approach is that, below the surface of booms and crashes generated by people's illusions and mistakes, there is a 'true' structure of an economy governed by the fundamentals captured by the ADM and revealed by

[35] The attempt to explain agents' beliefs represents one key difference between Akerlof and Shiller's behavioural approach and that of Farmer. In his recent book, for example, Shiller suggests that Farmer's self-fulfilling prophecies arise out of random 'mutations of million narratives' (ibid., p. 74).

[36] In this contribution, Akerlof focuses on the most significant current institutional 'biases against the soft and the new', such as journals' norms for what should or should not be published and mechanisms for academic promotion that cause major 'Sins of omission' and, in particular, "behavioural explanations to be downplayed in economics" (ibid.). See also D'Ippoliti (2020).

efficient financial markets. Indeed, in line with the rational expectations hypothesis, they do not dispute the existence of this structure, which is at least potentially knowable by agents. Unlike theorists like Lucas, they believe that, due to the widespread existence of animal spirits – such as the large number of narratives that go viral, analysed especially by Shiller (2019) – there is no 'communism of models' (i.e., people tend to have erroneous and heterogeneous expectations)[37] and the learning process of such a structure is not spontaneous. Although illusions or mistakes cannot last forever, it is crucial to help people get rid of them and recognize the 'true story' through nudging, education or better information.

On these grounds, one can better understand the real point of departure of the behavioural approach from mainstream new Keynesians. Not unlike the latter, Akerlof and Shiller regard the ADM as an ideal system that formalizes the invisible-hand view and believe that, in order to understand 'how the real-world economy works', a theorist must focus upon deviations from this model. It is by placing the emphasis on a special type of deviation – i.e., those of a moral and cognitive kind – that their approach departs from that of new Keynesians. While the latter focus on minimal deviations by following what Akerlof calls a 'one-deviation-at-a-timism' style (see Akerlof, 2019, p. 172; also, Caballero, 2010), the two authors advocate instead a much broader deviation from the ADM world:

> In our view economic theory should be derived not from the minimal deviations from the system of Adam Smith [...] from pure economic motivation and from rationality [...] but rather from the deviations that actually do occur and that can be observed [...] a description of how the economy really works must consider those animal spirits. (Akerlof and Shiller, 2009, p. 5)

4.3. Why is Akerlof and Shiller's approach a heresy?

It is important to realize that this approach does not achieve true reform either but turns out to be a form of heresy. Strictly speaking, unlike Farmer, Akerlof and Shiller do not question the Bible and current papal supremacy, namely the special status of the ADM in standard macro. The kind of heresy they pursue is more subtle. By extending the range of deviations from the norm and, in particular, holding that people fall systematically prey to illusions (that is, on average real people 'get it wrong'), they resemble the Cathars, a heretical sect popular in the Middle Ages that despised the flesh, regarding it only as illusion, and believed that purification was possible only by freeing the spirit from the body. While the Cathars ultimately worshipped God in the form of pure spirit, in contrast with the Church's position that God also exists in worldly flesh, Akerlof and Shiller regard the ADM as an ideal benchmark, quite separate from actual states of the economy. This contrasts with mainstream new Keynesians who – by focusing on minimal deviations from the ADM – ultimately defend its descriptive value, in particular by holding that, on average, real people 'get it right', as implied by the rational expectations heuristic device underlying all standard models.

Another reason why Akerlof and Shiller appear as heretics in the eyes of mainstream believers is that they too deliver an ultimately idiosyncratic message. On one side, they seem to doubt the very existence of God – namely, faith in internal stability – as when they introduce a new metaphor, i.e., the rollercoaster, to capture Keynes's view that the system is not self-

[37] As Shiller puts it: "Ultimately, the mass of people whose consumption and investment decisions cause economic fluctuations are not very well informed. Most of them do not view or read the news carefully, and they rarely get the facts in any discernible order" (Shiller, 2019, p. 86).

adjusting: 'We started work on this book in the spring of 2003. In the intervening years, the world economy has moved in directions that can be understood only in terms of animal spirits. It has taken a rollercoaster ride'. (Akerlof and Shiller, 2009, p. 1)

On the other side, the inexistence of God appears to be a temporary phenomenon. Indeed, just as the rollercoaster ride implies that excesses or departures from the 'standstill' norm (or from the smooth, gentle ride of the rocking horse) are temporary and must soon come to an end for a return to normal life outside the fairground, the economy is punctuated by a succession of events, such as booms and crashes, that on average tend to confirm the existence of a normal state, captured by the ADM, where, by definition, no such excesses could exist.

4.4. Why the new RP will not attract more disciples

It can be argued that, despite Akerlof and Shiller's professional brilliance and prominence, their heresy is unlikely to have substantial reformist Lutheran effects on macroeconomics, which in a narrow, technical sense, is a discipline characterized by the use of 'simple' aggregate models. Once again, the main reason is that Akerlof and Shiller fail to provide a constructive solution to Greenspan's problem. They actually seem to fall between two stools: while criticizing DSGE models, they do not build alternative, new ones.

This shortcoming reflects the fact that these authors are unable to solve the key problem of integrating various partial 'heterodox' insights into a coherent, unified representation of the economy as a whole, as an alternative to those based on the ADM. In particular, this is true for Akerlof, who is more concerned with traditional macroeconomic modelling than Shiller. In order to clarify this point, it is useful to make a comparison between Akerlof and a new Keynesian like Blanchard.

First, both authors seem to agree that in microeconomic analyses of individual markets any departure from the core mainstream principles – underlying the neo-Walrasian RP and well summarized by D'Ippoliti (see note 3 above) – is possible insofar as the aim is to produce a new separate, self-contained model or partial equilibrium insight concerning the working of particular mechanisms. On one side, Blanchard stresses imperfections in various markets as persistent features: 'Research on labour markets focuses on decentralization and bargaining; research on credit markets focuses on asymmetric information; research on goods markets on increasing returns; research on financial markets on psychology' (Blanchard, 2000, p. 1402). On the other, Akerlof himself has made many significant 'microeconomic' contributions, based on formal analytical tools such as utility functions, to study, for example, markets where sellers of products have more information than buyers about product quality or show – as in the new field of identity economics drawing on social psychology and many fields outside of economics – that individuals do not have preferences only over different goods and services but also adhere to social norms. Moreover, in focusing on the Great Recession, Akerlof stresses that, prior to the crisis, disparate 'subfields' of finance, real estate and macroeconomics – which, following Caballero (2010) can be regarded as the 'periphery' of economics as opposed to the

'core' (represented by DSGE models) – had laid out all the elements that were later deemed to have been the cause of the crisis:[38]

> Reviews post-crash along with the precrash articles themselves indicate that every significant aspect of the crash had been the subject of work by economists: for example, on fire-sale crashes […] on mis-accounting of current profits that would encourage tail risk […] on the housing market […] on conflicts of interest regarding payments to ratings agencies […] and on the interaction between the macroeconomy and the financial system. (Akerlof, 2020, p. 412)[39]

Second, as argued in the previous sections, both authors also agree that the ADM is the 'negative' benchmark for macroeconomists, in the sense that, while having no special descriptive value as for new classical theorists, it helps Keynesian economists to understand why the real-world economy cannot always be in equilibrium and counter-cyclical policies might be needed. The purpose of theory, therefore, is to explain departures from the benchmark due to frictions or imperfections in order to accommodate Keynesian phenomenology of crises (e.g., high unemployment) but without calling into question the hard-core postulates. However, as our previous analysis of the neo-Walrasian RP suggests, the attempt to build an alternative macroeconomics framework starting from the ADM faces enormous constraints. In particular, the problem is how to integrate the various partial equilibrium insights within an alternative representation of the system as a whole, still broadly consistent with the standard hard-core *and* heuristic principles that underlie the construction of simple macro models, such as reliance on rational expectations, representative agents and unique equilibrium. It is here that the two authors part company.

On one side, Blanchard advocates a solution to this problem, which is 'internal' to the neo-Walrasian RP. While in principle stressing the various imperfections, he ends up, however, by placing the emphasis on those imperfections that are consistent with the hard core of this RP, insofar as he hopes 'for an integrated model, based on *only a few central imperfections* (say, those that give rise to nominal rigidities, and one or two others)' (ibid., 2000, pp. 1402-3; emphasis mine).

On the other, Akerlof – while in principle advocating an 'external' solution to the standard RP – is unable to indicate a precise modelling strategy.[40] Suffice it here to note two points. First, for him, there does exist a general alternative macro model in principle but it is not publishable. Having listed the various one-deviation-at-a-time contributions that look like pieces in a puzzle, he argues that models putting the several deviations together do not exist because they

[38] Once having noted that the peripheral literature explored deviations from the core 'but only one such deviation at a time', Akerlof quotes Caballero (2010) for giving the methodological reasons for this modelling strategy: "The periphery is about isolating specific mechanisms. (Therefore) it surrounds the sources of these mechanisms with assumptions designed to kill unwanted effects that would pollute the message" (2020, p. 412). On the emergence of subfields in economics based on the use of standard micro analytical tools, which allow enormous flexibility of application (indeed, they can be used to tackle almost any topic in social sciences), see the insightful remarks by D'Ippoliti, who emphasizes the mechanism of 'axiomatic variation' and draws similarities between the creation of such 'micro' models and Wittgenstein's language games (2020, pp. 45-47).

[39] In a similar vein, Saint-Paul notes: "While the ultimate cause of the (2008) crisis is not entirely understood, many of its mechanisms are familiar to economists. This is because they already had the models to analyse those mechanisms. For example, it has been known for decades that falls in asset prices tend to reduce the wealth of households, which has a negative impact on consumption [...]. Other phenomena such as *contagion* or the epidemic spreading of insolvency […] are less well understood. But many economists have been working on phenomena like asset bubbles and crashes, bank insolvency and illiquidity, bail-outs and moral hazard for decades" (2010).

[40] Akerlof is thus particularly exposed to Farmer's harsh critique: "as […] Tom Sargent tells his students: 'it takes a model to beat a model'. Akerlof and Shiller's book criticizes classical economics but does not offer a viable or coherent alternative" (Farmer, 2009, p. 358).

are outside the range of the publishable due to current biases against soft research: 'There were incentives to present the key pieces of the puzzle, but none to put them together … a model with all the pieces could not have been published; it would have been considered too far from precise, simple ideas … such as DSGE ... and in this way too soft to merit publication' (2020, p. 412).

Second, when trying to discuss the features of this alternative model, Akerlof, however, cannot avoid admitting the cul-de-sac that this puzzle perspective is bound to face. In particular, he cannot get around the basic problem, well emphasized by D'Ippoliti, namely that the individual pieces are too heterogeneous to be really put together: "the various subfields produce contrasting results among themselves" (D'Ippoliti, 2020, p. 45).[41] Having noted, for example, that "models of financial crash differ fundamentally from the standard macro models" in the treatment of equilibrium states (unique vs. multiple equilibria), Akerlof himself remains skeptical on the possibility of a new synthesis: "It is thus difficult, if not impossible, to produce an aesthetically pleasing model that combines the two types of equilibrium. Such a model would be the equivalent of chicken ice-cream" (Akerlof, 2019, p. 179).

One advantage of the RP perspective adopted in this paper is that it provides an analytical justification for this 'impossibility' result: namely, while standard macroeconomic models typically focus on equilibrium, the features that behavioural theorists focus on concern typical 'disequilibrium' phenomena. Indeed, Akerlof and Shiller do not provide an alternative representation of a normal state of the economy with respect to that provided by standard theory. This is in line with their view that Keynes's theory is relevant essentially for dealing with pathological phenomena such as bubbles and fluctuations[42] rather than with the normal or structural working of the economy. Standard tools, such as DSGE models, thus still have a role to play in representing the latter.[43]

5. Conclusion

Following Farmer's powerful religion metaphor, according to which GET is like a 'broad church', this paper has tried to establish whether his research program and Akerlof and Shiller's behavioural approach succeed in reforming the general equilibrium church by building new models, including animal spirits as a structural factor, as required by Greenspan. It draws three main conclusions.

First, it is right to regard the research projects pursued by these authors as Lutheran reformist moves. Like Luther, they call into question the corrupt church authorities who ignore

[41] As D'Ippoliti makes clear, the problem is that with time, "different fields such as evolutionary game theory, behavioural and experimental economics, neuroeconomics, or New Institutional Economics have developed idiosyncratic hypotheses, and typically they have come to rely on methods and assumptions common only in their domain of specialty" (ibid).

[42] More specifically, seen through their lenses, Keynes substantially resembles Pigou, who suggested an approach to business cycles based on psychological factors, such as waves of optimism and pessimism.

[43] Akerlof and Shiller note, for example, that the classical theory "about the economy's stability is remarkably successful. For example, it explains why most people who seek work are employed most of the time – even in the trough of severe depressions. It may not explain, for example, why 25% of the U.S. labour force was unemployed in 1933 at the height of the Great Depression, but it does explain why, even then, 75% of the workers who sought jobs were employed. To our mind macroeconomics concerns *departures* from full employment: failure to be at such full employment must then result from a departure from the classical model" (2009, pp. 2-3; emphasis in the text).

animal spirits, whose consideration is essential to improve understanding of 'how the economy really works'.

Second, there is one major objective reason why such moves are unlikely to succeed in reforming the Church, namely the very nature of animal spirits, which turn out to be devilish features that are inconsistent with GET. The latter does not appear at all as the tolerant 'broad church' advocated by Farmer where almost 'anything goes' but rather as a strictly hierarchical organization with clear commandments and a pope (the ADM).

Third, what undermines these authors' reformist plans is another subjective feature: they lack both the appeal of Luther's ideal and its broad consistency with the Church's truly fundamental dogmas. Indeed, the authors' attempt to reconcile animal spirits with the church leads them to violate two such dogmas. On one side, while Luther proposed returning to a pristine original of what the ancient Church was like – i.e., closer to the spirit of the Bible – Farmer's models appeal to a dead pope (Hicks) against the current pope (the ADM), thus violating the dogma of papal infallibility. Moreover, our analysis suggests one further reason why Farmer's project does not have any notable Lutheran reformist effects: on close scrutiny, Hicks turns out to be quite similar to Debreu. More specifically, the paper has shown that animal spirits turn out to be inconsistent with Hicks's construction too.

On the other side, while Luther fought for the purity of the Church, Akerlof and Shiller's exclusive emphasis on animal spirits as irrational moves implies an over-purified conception of God (namely, the internal stability of the economy); insofar as this amounts to despising the flesh as such, it is heretical. It is one thing to consider real agents as potential sinners who occasionally yield to temptation but are ready to repent; it is quite another is to regard them as being systematic violators of commandments. The reason why this approach too lacks sizeable reformist effects on the church is that it turns out to be quite inconsistent with any formal models resting on some notion of equilibrium and normal behaviour.

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