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ANALYSIS OF THE FINANCIAL CRISIS, OR CRISIS IN FINANCIAL ANALYSIS?

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13

15 **ABSTRACT**

17 Purpose – *The goal of this chapter is to discuss the foundations of*
19 *'modern finance', its paradigm and conceptual framework, its methods*
and tools, its practices and results, its governance and regulation.

21 Design – *The first part presents the characteristics of 'modern finance'*
23 *and its negative effects. The second part analyses the efforts made to*
remedy those effects and argue about the need for a real reform.

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25 Findings – *Several aspects are pointed, for example an unreasonable*
'normality', incentives that encourage excess, the spread of subprime
crisis, etc. The contemporary finance is a 'giant with clay feet'.

27 Social implications – *We need to proceed with a dual reembeddedness*
29 *of finance in the economy and economy in society.*

31 **Keywords:** Finance; conceptual framework; paradigm; crisis; social
reembeddedness

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1 *'It looks like the worst of the major crises is behind us'* said a well-known
economist (Sorman, 2008) in spring 2008. The author, a champion of liber-
3 alism, stated that *'the economy is no longer a matter of opinion but a*
science'. While most economists were less conclusive and somewhat more
5 cautious in their opinions, there are still plenty of them who, especially
when it comes to finance, have long since adopted a rather haughty posi-
7 tion, considering that finance is now a separate scientific discipline, just like
physics or biology, calling on similar approaches to those applied by the
9 so-called 'hard sciences' in terms of epistemological paradigms, conceptual
frameworks and empirical validation protocols. This scientific posturing
11 has resulted in a widespread mathematisation of finance, which previously
made do with simple actuarial calculations and which, in just a few
13 decades, has virtually taken over the entire scope, leading to some impress-
ive modelling and a tendency to talk about the 'arrogance of finance'
15 (Bourguinat & Briys, 2009).

The goal of this chapter is not to embark upon another biased challenge
17 of the use of a highly formalised modelling and analysis approach but to
question that applied since the founding works of Markowitz (1952), Tobin
19 (1956), Modigliani and Miller (1958), and those that followed, including
Sharpe (1964), Fama (1970), Black and Scholes, 1973) and Ross (1977).
21 I intend to set out a few thoughts on this scientific movement, dubbed
'modern finance' or 'scientific finance' by its supporters, highlighting the
23 differences that set it apart from the 'traditional finance' that preceded it¹
and from contemporary issues; this comparative essay has been written in
25 the light of the current global financial crisis, the scope and impact of
which have led to questions as to whether 'analysis of the financial crisis'
27 is not in fact the reflection of 'a crisis in financial analysis'.

The first part of the chapter will present the characteristics of 'modern
29 finance' and its negative effects. I will then look at the efforts made to try
and remedy those effects and talk about the need for a real reform of finance.
31

33

'MODERN FINANCE' AND ITS NEGATIVE EFFECTS

35

37 Firstly, I will draw up a comparison of the characteristics that seem to
define 'modern finance', highlighting its most significant features, then I
will take the subprime mortgage crisis to illustrate this analysis, as this
39 is recognised as the trigger of the recent banking crisis and ensuing stock
market and economic slump.

A FEW MARKERS AND COMMENTS

This presentation will respectively deal with:

- the epistemological posture,
- the conceptual framework for formalisation,
- the ‘toolkit’ used by researchers and practitioners,
- regulations, professional conduct and ethics,
- governance and regulation.

The Epistemological Posture

Traditional or classic finance, as developed over a number of centuries (Braudel, 1967–1979), never really questioned its epistemological posture. However, if we observe the institutions in place or the practices of the stakeholders involved, we can note the importance of contingent factors (regulations, customs, etc.) that really ‘embed’ finance within the social fabric. Commercial law has been marked by this, referring to *affectio societatis* when a company is founded, approaching the client-banker relationship from a *fiducie* (or trust) angle, severely penalising the bankrupt, deemed to have damaged the relationship established in the trust.

Modern or scientific finance, sustained by its aim of becoming a real science, did away with these contingency factors to try and become a universal discipline, like its model, physics. It thought it had achieved this by applying mathematic formalisation comparable to that used by its model. In doing so, it committed a major epistemological error stemming from the specific nature of human and social sciences (HSS), not because those sciences refuse all rational approach to the subject under study, but because they are directly related to it.

(a) The argument sometimes known as the ‘Levi-Strauss theorem’ applies to HSS: it says that ‘*when an observer is of the same kind as the observed phenomenon, he/she is part of the observation*’ (Levi-Strauss, 1950). This does not only apply to the study of populations in distant countries but to all of us, especially those studying the economic world. This proximity between researchers and stakeholders is not without risk: it specifically raises serious epistemological, methodological and deontological questions in the fields of the HSS most concerned, such as psychoanalysis, pedagogy or – most relevant to us here – finance.

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1 (b) A second observation, related to the previous one, concerns the
 3 complex and sometimes reciprocal relationship between facts and their
 5 representations, especially in terms of predictions. In the so-called
 7 ‘exact’ sciences, the facts are what they are and the representations we
 9 produce, made up of expressions, may be simplistic or more sophisti-
 cated, enabling those who issue or receive them to understand the
 subject of the study without that subject being modified (apart from
 some very minor exceptions, e.g. modifications to a subject under study
 due to laboratory conditions).

11 I often give the example of a ‘badly behaved’ volcano. To summarise, a few years ago,
 13 a volcano started rumbling and, given the risk of an eruption, the government commis-
 15 sioned an appraisal by two well-known personalities. The latter gave conflicting
 17 opinions – for one of them, an eruption was imminent while the other said there was
 no risk. Applying the principle of precaution, the authorities evacuated the area but no
 eruption occurred. The subject under study (the volcano) was ‘doing its thing’ regard-
 less of the given representations. On the other hand, if a finance minister or central
 bank governor issues an opinion on a particular economic phenomenon, especially a
 financial matter, it is clear that this representation of the future will have a direct impact
 on its realisation.

19 In fields related to HSS, facts and their representations are often inti-
 21 mately linked, sometimes taking the form of ‘self-referential speculations’
 23 (Orléan, 1999) leading, as a result of mimetic behaviour, to self-fulfilling
 25 prophecies. This concept was identified in sociology a long time ago, most
 27 notably by American sociologist/epistemologist Merton (1948).² Therefore,
 the prediction contributes to the construction of reality. This specific
 feature of HSS was particularly well highlighted, for financial markets, not
 only by the work of researchers such as Orléan (1999), but also by testimo-
 nies from practitioners such as Soros (1998). Hence, the inclusion of finance
 within the scope of HSS leads to a ‘need to take mimetic and self-referential
 rationalities into consideration’ (F. Lobez – discussion with the author).

31 (a) A third observation, which is also congruent with the previous two, can
 33 be made on the complementary nature between the ‘processes’ and the
 35 ‘products’ of activities relating to ‘knowledge of action’ in HSS. The
 37 production ‘process’ of a given product (goods or service) is itself a
 39 social product ‘induced’ relative to the main product. This process-
 product interaction is especially sensitive when the main product is
 immaterial in nature and therefore directly relating to human activity.
 We can then legitimately ask whether, as in Escher’s images, the repre-
 sentation of a phenomenon not only interferes with that phenomenon,
 but – to a potentially vital degree – blends into it or even replaces it.

1 However, this specific feature of HSS is not without risk: the researcher
 3 may move on from thinking ‘I believe it because it’s true’ to ‘it’s true
 because I believe it!’ The limits are that of good old-fashioned self-
 5 persuasion ... or more precisely, a switch from an attitude based on
 Reason and experience to another founded on Revelation and affirmation,
 7 with the risk of not venturing out from that ‘enchanted’ world (as defined
 by Gauchet, 1985).

As we will attempt to show below, this appears to be particularly true
 9 of finance.

11 *The Conceptual Framework for Formalisation*

13
 15 Classic finance developed within a relatively simple conceptual framework.

- 17 • distinction between equity and borrowings
- 19 • distinction between the ‘equity financing’ and ‘debt financing’
- 21 • lender’s risks measured in terms of liquidity (at the different maturity
 dates) and solvency; the latter could be consolidated with a guarantee
 (mortgage or pledge), insurance or deposit.

23 Modern finance has simultaneously simplified and complicated this
 conceptual framework.

A. The simplifications are often major and cover, on the one hand, the
 25 conceptualisation of risk and, on the other hand, the distinction
 between assets and debts according to their term.

- 27 a. Risk analysis, the main element in any financial theory, focuses on a
 perception of risk limited to the variability in the flow of income
 29 generated by a given financial asset and therefore that asset’s return
 rate. The other dimensions of risk – especially a borrower defaulting
 31 with respect to their creditor – were initially either neglected (seen
 as ‘incidents’ occurring outside the usual framework), taken into
 33 consideration in interest rates (which could be differentiated accord-
 ing to the borrower’s capacity), or dealt with separately. In this
 35 simplified approach, debts are thus seen as ‘risk-free capital’ (i.e.
 remunerated at a fixed rate or at least a rate established *ex ante*),
 37 contrary to equity which is ‘risk capital’ (i.e. subject to the risk of
 variability in remuneration rates).

39 As we know, Markovitz’s major contribution (1952) – earning
 him the Nobel Prize for Economics – was to consider the rates of

1 return on risky assets as random variables – ‘*Let Y be a random*
 3 *variable, i.e. a variable whose value is decided by chance*’ (Markowitz,
 5 1952) – opening the way for a ‘mean-variance’ approach to the
 ‘return-risk’ pairing. This initial posture has remained fundamental
 and is sometimes even used as a general definition of financial risk.³

b. The distinction between assets and debts according to their term,
 7 pitching ‘equity financing’ (long-term assets vs. so-called ‘permanent’
 9 capital) against ‘debt financing’ (assets vs. liquid or short-term fund-
 11 ing) is no longer seen as major. As such, the working capital require-
 13 ment approach is neglected to the benefit of a more global ‘resource
 15 pool-jobs pool’ approach (Levasseur, 1976). This second simplifica-
 tion adds to the first, refocusing financial analysis on the expected
 return from assets, and risk in terms of variability of that return and
 the effect of financing structure; the latter is considered as neutral
 (outside tax biases) in the well-known demonstration given by
 Modigliani and Miller (1958).

17 B. However, increased complexity appears to more than have made up for
 19 the simplification described above. Here, I will limit myself to listing a
 21 few of the main steps taken in the 1970s and 1980s when the major
 components of modern financial theory were established, on the basis
 of the founding works of the 1950–1960s (among others, see the work
 of Tirole, 2006).

- 23 ○ a deepening of portfolio theory (Fama, 1970; Myers, 1977, etc.)
- 25 ○ the theory of rational optional pricing (Black & Scholes, 1973;
 Merton, 1973)
- 27 ○ the signalling theory (Ross, 1977)
- the theory of the firm (Jensen & Meckling, 1976)
- the pecking order theory (Myers & Majluf, 1984)

29 These developments occurred at such a rate that we can qualify the period
 31 in question as exceptional, leading modern finance to claim the status of a
 separate scientific discipline, setting itself apart from economic and man-
 33 agement sciences.⁴

It should be noted that this construction, however rich it might be, is
 35 mainly based on the fundamentals initially referred to. ‘*It is as if the agents*
 37 *were aware of the actual structure of the economy in which they were acting*’
 (Rainelli, 2008). This explicit or implicit assumption of a universe that
 already existed before research began to look at it brings us back to the
 39 epistemological debate that pitched ‘positivists’ against ‘constructivists’ for
 decades (Le Moigne, 1994–1995). In HSS, the debate was apparently

1 clarified by Levi-Strauss's theory: as the observer is an integral part of the
phenomenon observed, the representation that they give of it helps to 'con-
3 struct' it. In finance, this 'truism'⁵ was highlighted in the works of research-
ers such as Orléan (1999), MacKenzie (2006)⁶ and Amatte (2009)⁷ and by
5 practitioners such as Soros (1998).

7

The 'Toolkit' Used by Researchers and Practitioners

9

11 Analysis, modelling and forecasting tools have significantly developed
over the last few decades in the field of finance, with creativity seemingly
boundless. When modelling finance, the perception of a structured universe
13 with random variables leads to immoderate use of axioms and probability
calculations, which now appears highly debatable.

15

An Unreasonable 'Normality'

17 As we have seen, the fundamental basis of the portfolio theory is founded,
since Markowitz (1952), on a 'mean-variance' analysis supposed to repre-
19 sent the 'return-risk' pairings that characterise the various types of asset on
the financial market. According to him, virtually all work on modern
21 finance has been devised on this same basis and has, explicitly for certain
and implicitly for others, considered that the laws of probabilities con-
23 cerned were 'normal' laws or came very close to 'normality'.

This explicit/implicit assumption comes with huge advantages in terms
25 of modelling and calculation. Researchers in finance have made the most of
it and from the thesis presented by W. Sharpe in Chicago in 1959 to the
27 latest finance theses defended in Paris, London or Shanghai, hundreds of
papers have built something akin to a 'cathedral' devoted to modern
29 finance. Observers of this impressive construction can only admire its
breadth and the apparent rigour backed by sophisticated formalisation.

31 Nonetheless, those same observers might take a closer look and wonder
about the conceptual framework and analysis tools used and in that case
33 will be astonished by the narrow scope of the initial basis – especially how
risk is focused on the variability of return rates alone – and on the sys-
35 tematic use of Gaussian laws as a matter of course (as implied by their
assumed status as 'normal laws').

37 Yet, in my view *the realm of finance does not seem to be governed by these*
normal laws; it is this finding that forms the main criticism of so-called
39 scientific finance, because it refers to the fundamentals of the conceptual
framework and formalisation tools defined by Markowitz.

1 My position is backed by three successive observations:

- 3 1. in fields of the earth sciences, many phenomena – and not the least
5 important – are not related to laws of probability as simple as normal
7 law. To take meteorology as an example, a scientific field to which mar-
9 ket finance is often compared: despite the powerful calculation resources
11 available, attempts at modelling and forecasting come up against diffi-
13 culties inherent to the complexity of the processes at work. This is not
15 Laplace-Gauss’s reassuring context but instead a configuration linked to
17 catastrophe theory (Thom, 1972–1983); modelling has to include analy-
19 sis in term of fractals (Mandelbrot, 1973) rather than conventional
21 probabilities.
- 23 2. in the field of life sciences, this situation is even more marked. In biology
and the related disciplines (medicine), modelling has undergone signifi-
cant progress over the last few decades within the framework of major
finalised research programmes (e.g. cancer or AIDS). Even more so than
in physical sciences, the processes of evolution of living species are com-
plex and rarely fit in a Gaussian analysis framework.
3. in the field of HSS that concerns us here, this finding is even more strik-
ing and appears to be directly related to Levi-Strauss’s observations and
the epistemological consequences in terms of bijective relations between
the researcher and the phenomena observed, through the co-construction
of those phenomena and their representation.

25 In finance in particular, as we have seen with different authors
expressing it in their own words (P. Jorion, D. A. MacKenzie, A. Orléan,
27 R. J. Shiller, G. Soros, N. N. Taleb, etc.), this permanent interference is the
source – with mimetics amplifying the self-referencing – of cumulative
29 phenomena frequently seen in the form of ‘bubbles’. This clearly falls out-
side the reassuring context of normal laws and comes closer to the more
31 turbulent realm of storms or indeed chaos. This leads us to the use of
the tools mentioned above (R. Thom, B. Mandelbrot) to represent
these evolutions.

33 Analysis instruments such as ‘*Value at Risk*’ (*VaR*), until recently seen
as the ultimate steering tool, are now criticised and users are rightly taking
35 an interest in the potentially damaging consequences of events that were
seen as rare and therefore neglected. Even supporters of probabilistic calcu-
37 lation agree: ‘*On financial markets ... we are looking very closely at these
rare events. The financial crisis has renewed interest in these questions*’ (El
39 Karoui, 2009). The conventional image is often that of turkeys, well fed
every day but sacrificed once a year for Thanksgiving. For them, VaR is

1 excellent, bordering on 99.7! We could use similar examples such as reserve
parachute or airbags ... all items with low probability of use but where the
3 consequences may be dramatic. See the 'black swans' that Thaleb (2009)
talks about when reporting the criticism made by Mandelbrot (1997).

5 Likewise, with regard to accounting, the hasty application of 'fair
value' – and more generally the IFRS standards – drew criticism (Bignon,
7 Biondi, & Ragot, 2009; Capron et al., 2005; Casta & Colasse, 2001;
Colasse, 2009; Marteau & Morand, 2009).

9 Hence, the excessive 'normality' on which the entire scientific finance
edifice has been built actually weakens it: despite the considerable develop-
11 ments it has been subject to, the entire finance conceptual framework is
akin to the legendary 'giant with feet of clay'.
13

15 *Incentives that Encourage ... Excess!*

17 While researchers have taken portfolio theory to the extremes of sophistica-
tion, practitioners have developed a vast number of management instru-
19 ments which, in their view, can serve as incentives for the stakeholders
concerned, rewarding their performance which is itself a guarantee of the
smooth functioning of the markets. This direction, congruent with the poli-
21 tical philosophy of the liberal model, is not debatable in itself.

23 However, these new tools have often been the source of disruption or
difficulties, the origin of which lies in their design, structure or the condi-
tions in which they are used. I will list of few here:

- 25 • remuneration methods (bonuses, stock options, etc.) for market opera-
27 tors and their leaders encourage them to take very risky positions
and with unreasonable volumes.⁸ One of the specific – often
29 criticised – features of these remuneration methods is that they are
asymmetrical: even though amounts are often very high, they reward
31 gains but do not penalise losses (other than potential reputation loss). As
a result, the incentives encourage risk-taking. It is a situation that could
33 possibly be acceptable in a 'normal' universe, exterior to the agent.
However, it cannot be accepted when we acknowledge that the financial
35 markets are neither 'normal' nor exterior to the agents operating
on them.
- 37 • market intervention techniques (e.g. short selling) clearly illustrate the
potential for drift; the self-referencing postures taken by certain are
39 amplified by the mimetic behaviour of others and can result in 'self-
fulfilling prophecies' or even price manipulation.

- 1 • the creation of special purpose vehicles (SPV) has enabled the develop-
 2 ment of a series of operations not subject to any control (see below).
 3 • the ‘too big to fail’ approach results in governments propping up large
 4 financial establishments, given the systemic risk that their failure would
 5 incur, and has also encouraged risk-taking.⁹
- 7 There are plenty of other examples; together, they form an image of a very
 8 well-developed, quite animated financial landscape but one that shows all
 9 the signs of excess.

11

Regulations, Professional Conduct and Ethics

13

14 When it comes to economic behaviour, it is not always easy to draw the
 15 line between aspects related to the regulations in force, those related to pro-
 16 fessional conduct (deontology) and those linked to the personal ethics of
 17 the agent in question.

- 19 • Regulations are more or less stringent according to country – and per-
 20 iod. They express the public authorities’ reaction after a crisis and thus
 21 tend to flourish at regular periods (e.g. Sarbanes-Oxley Act in the United
 22 States and the LSE law in France after the 2001 recession).
 23 • professional codes of conduct express self-regulation among the agents
 24 themselves, in the form of codes of ethics and recommendations on ‘best
 25 practices’, a mixed bag making up the ‘soft law’ that replaces or com-
 26 pletes public regulations.
 27 • personal ethics go beyond regulations and codes of conduct and concern
 28 the behaviour of the agent in line with their own set of values, shaped by
 29 their history, education and philosophical positions.

31 At this level, I will merely outline a few thoughts:

32 Traditional finance put great focus on these different aspects to the
 33 extent that it became known as ‘institutional finance’, taking a different
 34 form from one era to another, from one country to another and even
 35 within one country, from one sector or social group (usages) to another.

37 Modern finance, taking the posture of a ‘scientific’ discipline, freed itself
 38 from these aspects, seen as obstacles to the universalisation required by
 39 any science worthy of that name. As such, the regulations-professional
 conduct-ethics triptych has been minimised:

- 1 • public rules guarantee the smooth running of the market. Furthermore,
3 compliance with the terms of a regulatory provision does not always
5 imply compliance with the spirit of that provision. In fact, it is the role
7 of tax experts to seek out ‘deadweights’ so that their clients can benefit
9 from an advantage or evade a constraint (e.g. tax) with no bearing on
the spirit that led to the introduction of the provision in question.
- 7 • professional organisations are not referred to; codes of conduct express a
‘soft law’.
- 9 • personal ethics are those of *Homo economicus* described by the doctrine.

11

Governance and Regulation

13

15 Here I will look at the ways a sector of activity is organised and at the
different levels of management, governance and regulation systems
(Pérez, 2003–2009).

17

- level 1 concerns the management of entities by their directors
- level 2 is governance, seen as ‘management of the management’ by an institutional system and behavioural practices
- level 3 is regulation of the sector in question by specific provisions (professional orders, administrative bodies and legal bodies)
- at higher levels (4–5) we find ‘meta governance’ with the harmonisation of the regulatory devices and the international agreements that condition them.

25

27 Due to its sovereign dimensions – via currency and the protection of
savings – finance has always been a very closely monitored sector, at all
the levels mentioned above.

29

31 Traditional finance was, as I have recalled above, very institutional, with
states playing a significant role that has been more or less implicit depend-
ing on the period and the configurations adopted. For example, in France
various bodies regulate different aspects of the financial sector: banking
33 commission, insurance commission, the AMF (stock market regulator)
and so on.

35

37 Modern finance has had to take on-board this requirement for regula-
tion in the sector via the central banks and stock market authorities.
However, we witness a growing proportion of operators, products and
actions related to financial activity falling outside the scope of these
39 controls and thus the controls themselves. Among the most significant
examples, there is the aforementioned use of SPV, often domiciled in

1 tax havens, escaping restrictive regulations. More generally, *shadow bank-*
 3 *ing* concerns a growing portion of the contemporary global finan-

5 cial universe.
 Moreover, we will see that the increasing sophistication of financial
 7 activities makes it difficult to comply with one of the principles guiding
 multivariate systems – the principle known as the law of requisite variety
 9 defined by Asby¹⁰; a difficulty that results in insufficient internal control, as
 illustrated by the Kerviel affair, and incomplete controls between agents or
 sub-systems, as illustrated by the subprime mortgage crisis, which I will
 analyse below.

11

13

15 AN EXAMPLE: THE SUBPRIME MORTGAGE CRISIS

17 Since summer 2007 and even more so since autumn 2008, the contemporary
 world has been subject to a severe crisis that began in the banking sector
 19 and was initially limited to the United States (the so-called subprime mort-
 21 gage crisis) but later spread to the entire global financial system triggering
 a major recession with drastic social and political consequences. We can
 23 thus ask the following question: ‘what does this financial crisis teach us,
 especially with regard to the evolution of finance and its claim of
 being “scientific”?’

25 Much has been said and written about this affair, sometimes by those
 who shortly before were lauding the dynamics and creativity of modern
 27 finance. However, well before the current crisis, researchers had already
 drawn attention to the issues at stake. In France, for example, M. Aglietta,
 29 H. Bourguinat and E. Briys, F. Morin, A. Orléan, O. Pastre, or outside
 France, the Observatoire de la Finance (Geneva – CH) and its review
 31 *Finance et bien commun* (Finance and the common good, P. H. Dembinski),
 or in the United States the work of P. Jorion, de Shiller and de Taleb
 (see Bibliography).

33 To focus on the key points, I will explain the extent and uniqueness of
 this crisis by breaking it down into three successive components, each one
 35 fed by and amplifying the previous one.

- 37 • its beginnings in a compartment of the American mortgage market,
- its contamination of other compartments of finance,
- 39 • its spread to the rest of the world.

1 *The Beginnings of the Subprime Mortgage Crisis Lie in a*
3 *Shift in the Debt Paradigm*

5 There are many debt techniques and procedures, varying according to the
7 society in question and its institutional and regulatory systems, culture and
9 the conduct of the agents concerned (Pérez, 1973). However, we can place
11 these different forms of debt alongside a few simple principles that govern
13 most transactions made between economic agents in contemporary indus-
15 trial societies.

17 The first is the consideration of a decision by a lender to grant a loan
19 according to the borrower’s capacity for repayment.

21 The second is the assessment of that capacity taking into account future
23 evolutions in the borrower’s income and expenditure and thus their saving
25 capacity; the loan granted can be seen as anticipated savings flow (annuities
27 law).

29 The third is protection against the risk inherent to all estimates of future
31 events, by taking a number of precautions:

- 33 • firstly, limiting expenditure to service the loan granted (interest served
35 and repayment portion) to a ‘reasonable’ fraction of the agent’s income
37 for the given period.
- 39 • secondly, obtaining a guarantee (pledge, mortgage, etc.) on the item
41 funded by the loan – or on other property – and making sure that the
43 value of those items, if they were sold (on secondary markets), is suffi-
45 cient to cover the debt maturities.
- 47 • finally, if necessary, other institutional instruments may be called on
49 (insurance, third-party guarantee, etc.) to reduce the risk or cover it at
51 reasonable cost.

53 All of these principles and the ensuing measures form the classic
55 debt paradigm.

57 It was this classic paradigm that was compromised with the arrival of
59 subprime mortgages. For this category of loan, from the outset seen as
61 ‘inferior to better loans’ (hence the name), the first two principles of the
63 classic paradigm were cast aside; the loan was no longer viewed through
65 the conventional annuities law but from the viewpoint of the durable good
67 (real estate) to be acquired and the presumed increase in the market value
69 of that good. In this new debt paradigm, the security system is in fact the
71 opposite of the previous configuration: the first dimension (link between
73 debt servicing and the agent’s income) was neglected to the benefit of

1 the second (link between the debt and the asset); a stock-based approach
 3 replaced the flow-based approach. The other institutional security instru-
 5 ments (insurance, guarantee, etc.) are not called on, except in excep-
 7 tional cases.

9 This paradigm shift is clearly debatable in ethical terms. Failure to con-
 11 sider the borrower's repayment capacity in line with future income and
 13 expenditure flows implicitly recognises that the durable good thus funded
 15 will one day have to be sold to cover the debt maturity. When real estate
 17 prices are rising, this new paradigm can work for so long (wealth effect)
 19 but it obviously stalls when there is a downturn in the real estate market; in
 21 fact, this downturn is inherent to the very functioning of the system and
 23 leads to mortgaged goods being seized from defaulting borrowers and their
 25 homes being sold.

Practices in the subprime mortgage sector further aggravated the ethi-
 cally debatable direction taken by the new debt paradigm:

- 17 • mortgage applications filled in superficially – or sometimes falsely
- 19 • loans covering up to 100% of the value of the property – or even more
- 21 • deferred repayment going beyond reasonable periods
- 23 • variable interest rates, starting with abnormally low rates (*teasing rates*)

25 It is significant that a certain number of intermediaries that put together
 27 subprime mortgage applications – commercial agents paid on percentage –
 29 disappeared without leaving an address after the outbreak of the affair.
 31 In these cases, it is no longer a matter of debatable business ethics but a
 33 question of breach of trust and criminal law.

35 *Contamination through Securitisation or Market Transfer of the* 37 *Lender's Risk*

39 The classic debt paradigm, the conditions of which are described above,
 41 has a corollary aimed at the evolution of the loan once it has been taken
 43 out. It is usually the credit institution – which defines the conditions of the
 45 loan – that oversees its implementation until its term. It therefore assumes
 47 what we can call the 'lender's risk' in return for which it receives interest
 49 including a portion above the base rate (reflecting the cost of time or a 'pre-
 51 ference for the present' discussed by I. Fisher in 1907) as a complement
 53 (*spread*) and corresponding to a 'risk premium' that varies according to the
 55 quality of the loan and the measures taken to secure it.

1 Against this background, it was normal for ‘subprime’ loans, which are
3 riskier than the loans granted to better clients (‘prime rate’) to be subject to
5 higher spread; thus subprime interest rates are, by definition, higher than
7 the prime rate.

9 This kind of situation was acceptable as long as the institutions granting
11 these subprime mortgages pretty much indiscriminately were able to
13 assume the consequences themselves. They were running a higher risk and,
15 in return, they benefited from higher remuneration. All perfectly normal!

17 The balance was upset when securitisation began. The principle of this
19 kind of operation is well-known.¹¹ Whenever a certain number of bilateral
21 debs between a lender and a borrower can be compared in terms of rate,
23 term and quality, it can be feasible to offer them in the form of representa-
25 tive securities that can be traded on the financial markets. The securitisation
27 of debt is not in itself condemnable; it can even contribute to the improved
29 functioning of the economic system by providing better liquidity, adding an
31 additional element to the ‘trading instruments’ identified by F. Braudel.
33 However, this kind of transfer of receivables/payables to the financial mar-
35 ket can only be acceptable if the conversion does not denature the items
37 involved and maintains their main characteristics.

39 In fact, what happened with the securitisation of subprime mortgages
41 was quite the opposite. We would have thought that the institutions grant-
43 ing them would put them together in a uniform package, but clearly the
45 securities issued against this set of doubtful debts would have had trouble
47 finding a buyer, unless the remuneration conditions absorbed the full
49 spread assigned to the subprime mortgages. The approach taken by the
51 institutions issuing doubtful debt meant transferring the risk at least cost,
53 that is retaining a portion of the initial spread. To this end, the techniques
55 used may appear quite sophisticated at first glance but were really quite
57 simple. Subprime mortgages were mixed with other, less doubtful debts
59 then these sub-packages were themselves broken down into tranches. In the
61 end, the securities issued against a varied set of receivables (*Asset Backed
63 Securities – ABS*¹²) could no longer be linked to the risks inherent to the
65 nature of the subprimes they included.

67 Hence, securitisation resulted in a contamination of the risks linked to
69 subprime mortgages. The ethical dimension of this contamination is evident
71 and, all other things being equal, can be compared to viral infection. The
73 very fact that they carried out these financial engineering operations implies
75 that the heads of the institutions concerned clearly knew what was
77 involved, namely the transfer to the financial market of the risks inherent
79 to subprime mortgages by concealing them in a composite package of

1 receivables; an operation that may have justified a substantial risk premium
 3 but one that was inferior to that initially demanded on the subprime
 mortgages.

5

7 *The Spread of the Subprime Risk through the Globalisation of*
Financial Markets

9

11 Securitisation led to financial markets being contaminated with the risks
 inherent to subprime mortgages; the globalisation of those financial mar-
 13 kets did the rest, making sure the risk spread to the rest of the planet. To
 stay with the medical metaphor, the infection became a pandemic.

15 The mechanisms of propagation are quite simple: the interconnection of
 financial markets, the dematerialisation of market operations and ever-
 17 increasing data processing capacities enabled the introduction of continual
 arbitration processes for the various saving-investment products, the vehi-
 19 cles offering them and the markets listing them. A fund manager, regardless
 of size, seeks to obtain the best conditions (profitability, risk, availability,
 21 etc.) for the sums being invested; that is basically their job. As such, from
 the large American investment funds, handling more than a hundred billion
 23 dollars of retirement savings, to the company, local authority or associa-
 tion looking to make the most of their reserves amounting to several
 thousand euros, investors have a vast choice of investment opportunities.

25 *Asset Backed Securities* were of course among the opportunities on offer
 and appeared very attractive in terms of risk and return, the analysis matrix
 27 forming the basis of portfolio theory since Markowitz (1952). This favour-
 able leaning towards ABS was reinforced by a number of initiatives taken
 29 by the professionals:

- 31 • action by the rating agencies (Standard & Poor's, Moody's, Fitch) whose
 job is to asset the quality of securities on offer so that investors are as
 well informed as possible;
- 33 • the emergence of *Credit Enhancement*, new specialised (monoline) entities
 making sure that a given security comes with a sufficient guarantee to
 35 allow for better rating by the aforementioned agencies;
- 37 • the creation of new investment product compartments – such as
 'dynamic money-market funds' mainly made up of fully secured securi-
 ties but potentially including a small portion of other products (the
 39 'dynamic' element) with better apparent return though in theory not
 incurring a greater risk than the 'classic' money-market funds.

1 We could provide plenty of other examples like this as the financial
industry has been highly creative over the last twenty years. These initia-
3 tives mutually reinforced one another: the application of a credit enhancer
allowed for a better rating of a security issued in ABS form, making the lat-
5 ter eligible for dynamic money-market funds, which were put forward as a
non-risky, income-earning investment, the whole set-up appearing coherent
7 and well controlled.

8 However, in ethical terms, these various initiatives and practices need to
9 be balanced.

11 – At the end of the financial chain – where the ‘producers’ (of new finan-
cial products) are found – it is clear that those behind these innovations
13 knew exactly what they were doing, namely helping to reduce the risks
incurred by maintaining a returns differential higher than the cost
15 inherent to the risk reduction operation. Their practices were therefore
efficient in terms of portfolio theory. Nonetheless, they are still
17 debatable from an ethical viewpoint, insofar as the risk reduction trans-
action was more apparent than real, with the event generating the risk –
19 the risk of default by borrowers with subprime mortgages – concealed.

– At the other end of the chain – where we find the ‘consumers’ (of securi-
21 tised assets) – it is clear that they are not directly liable but are instead
victims of the construction, which – as I said above – appeared soundly
23 built and well controlled. At the most, we could criticise their lack of
vigilance, a criticism they could counter, arguing that guarantees were
25 provided with the existence of an AAA rating or the application of a
credit enhancer.

27 In fact, the debate about ethics and the financial crisis should largely
29 focus on the auxiliary stakeholders;

- 31 • if the credit enhancers had done their job, they should have reached as
far as the event generating the subprime risk and therefore challenge the
33 shift away from the classic debt paradigm. Few subprime mortgages
would then have been enhanced, or their insurance cost would have
reduced their appeal for the issuing institution;
- 35 • if the rating agencies had done their job properly, they would have acted
in the same way and downgraded most ABS securities comprising sub-
37 prime mortgages, indicating a substantial default risk.

39 On the contrary – as we know – the various categories of intermediary
were very flexible, or indeed lax, with their actions and evaluations, directly

1 contributing to the fabrication of the ‘giant with clay feet’ that is contem-
 2 porary finance.

3

5 **THE CHALLENGES FACING MODERN FINANCE:**
 6 **A DRIVE FOR REAL REFORM**

9 The first part of the chapter presented the characteristics of ‘modern finance’
 10 and its negative effects, as illustrated by the subprime mortgage crisis. In this
 11 second part, I will look at the efforts made to remedy the negative effects
 12 and, on finding them inadequate, I will discuss the need for real reform
 13 affecting the policies governing finance as well as the conceptual framework
 14 of this area of knowledge and the training of stakeholders concerned.

15

17 *The Discordant and Generally Inadequate Reactions of*
Stakeholders and Researchers

19 The financial crisis was initially linked to subprime mortgages but went on
 20 to trigger a major financial and economic downturn. The effects of the glo-
 21 bal recession can still be felt (e.g. the Greek crisis) and it is too soon to ana-
 22 lyse all of its aspects and draw all the conclusions. The months and years
 23 to come will no doubt see a number of events that will modify the context
 24 of the recession and hence the analysis we can make of it. Nonetheless,
 25 researchers, especially in the field of social sciences, cannot avoid reference
 26 to such a far-reaching phenomenon, modifying not only the conditions
 27 under which economic systems function but also the analysis matrices con-
 28 cerning them, and indeed the underlying epistemological, theoretical and
 29 normative postures. It would thus appear appropriate to provide some
 30 thoughts to contribute to the debate.

31 Financial stakeholders – professionals in the sector and those responsi-
 32 ble for its regulation – and researchers in finance do not have the same
 33 responsibility (or the same status); it is thus preferable to look at the reac-
 34 tions of these two categories separately, reactions that are discordant and
 35 inadequate given the importance of the challenges to be met.

37

38 *Inadequate Practical Responses*

39

It is clear to all observers that the global financial crisis has political, legal
 and ethical dimensions, some of which are explicit and others implicit, and

1 related to the way that the financial and economic system functions on a
2 global level. Let us look at some of those dimensions:

- 3
4 (a) on a regulatory level, what new measures have been introduced in light
5 of the current crisis, which demonstrates the excesses of deregulation?
6 This is open to debate but the problem is an international and political
7 one. An effort clearly has to be made to close the loopholes in the cur-
8 rent regulatory systems (off-balance sheet entities, tax havens, shadow
9 banking, etc.).

10 To date, a number of measures have been introduced in several
11 countries, especially the United States and Europe. For example, the
12 pressure applied by the United States on different countries, resulting
13 in the gradual lifting of banking confidentiality in those countries (e.g.
14 Switzerland). Likewise the amount of the fines to be paid for various
15 offences – on the basis of an agreement with the legal authorities to
16 avoid prosecution (as permitted by the American legal system) – now
17 reaches substantial levels, sometimes billions of dollars.

18 However, serious limits still remain, in two respects:

19 – on the one hand, not all countries are concerned; in fact, within a
20 given country, a particular zone may benefit from an exception
21 (such as the Channel Islands in the United Kingdom, the state of
22 Delaware in the USA).

23 – on the other hand, most of the measures decided fall short of what
24 is actually required (the separation of speculative activities and com-
25 mercial activities in banks has only led to half-measures, despite the
26 consensus among most observers and analysts on its necessity).

27 Measures between countries are discordant and uncoordinated thus
28 leaving a number of gaps in the supervisory mechanisms, meaning they
29 are pretty much ineffective.

- 30 (b) in terms of professional conduct, the weaknesses seen in the financial
31 sphere have largely undermined the self-regulatory systems of the pro-
32 fessions concerned and it is likely that this discredit will persist for
33 some time.

34 What is more, the professional bodies have a natural tendency to
35 become pressure groups serving their members, with professionals in the
36 financial sector able to mobilise considerable know-how and resources
37 for lobbying work. Close observation of the processes used to devise reg-
38 ulatory measures in this sector highlight the effects of this lobbying
39 before the sovereign authorities and largely explains the half-measures
described above concerning the separation of speculative and commercial
business.

1 (c) in terms of personal ethics, among the stakeholders in the chain of
 3 operations making up the financial crisis, like that of the subprime
 5 mortgage crisis, many of them can question their own conduct – from
 7 the broker that sold a mortgage to a clearly insolvent family and took
 9 his commission, to the ‘financial genius’ who worked out how to conceal
 11 the risks inherent to those mortgages by diluting them in an ABS
 package, and including the analysts at work within the credit enhancers
 and rating agencies and who were very lax in their duty of supervision.
 Looking beyond one particular form of personal conduct, and without
 going as far as the more criminal behaviour of Kerviel or Madoff, the
 current crisis has called into question what M. Weber called ‘the spirit
 of capitalism’.

13

15

A Divided Scientific Community

17

19

21

The scale of the global financial crisis and its devastating effects led to a
 challenge on the conceptual framework of finance as an object of scientific
 knowledge and as a set of professional practices. However, the criticism
 currently aimed at modern finance is not consistent and can be split into
 three groups, corresponding to successive levels of questioning.

23

(a) Questioning of practices alone

25

27

29

On this first level, supporters of modern finance consider that the
conceptual framework and the exceptional ‘toolkit’ forged over the last
 few decades are not to blame. If errors or failings have occurred, they
 are to be blamed, not on the analysis framework or the tools, but on
 individual people. History, and especially in finance, has shown that
 there are always people seeking to play with the rules, such as Jérôme
 Kerviel, or to fraud savers such as Bernard Madoff.

31

33

35

Human nature being what it is, if those people did not have high
 enough ethical standards to prevent their inappropriate conduct, the
 supervisory and control systems simply need strengthening and proper
 sanctions introduced for clear breaches. This alternative – ‘*Ethics or
 Stick*’ – is agreed on by all, even the most liberal circles, at least in
 official statements.

37

(b) Questioning of the tools and models without changing the paradigm

39

On this second level, criticism is more precise; without questioning the
 foundations of the conceptual framework – that is the paradigm – we
 can criticise the toolkit or, at least, a particular component. Analysis,

1 modelling and forecasting tools have significantly developed over the
last few decades with creativity seemingly boundless. In terms of risk
3 modelling, the perception of a universe structured around random vari-
ables led to the immoderate use of axioms and Brownian motion laws,
5 which now appears to be highly debatable (Bourguinat & Briys, 2009;
El Karoui, 2009; Mandelbrot, 1995, 2005; Taleb, 2008; Walter & de
7 Pracontal, 2009, etc.). The current range of tools used (actuarial princi-
ples and probabilities) should be expanded to take in other mathemati-
9 cal tools (games theory, fractals, etc.)

Mathematicians, who have gradually acquired a dominant position
11 in the field of finance research, fully support this questioning which,
once past errors have been admitted, grants them an almost unlimited
13 'market'. As an example, take the statement made by a colleague in a
large Parisian university: *'It is time for the finance sector to use models
15 that have proven their value to the same extent as those developed in
other sensitive industries such as the nuclear industry or pharmaceuticals'*
17 (E. Jouini, colloquium on the reform of finance, November 27, 2009).

(c) Questioning of the current paradigm

19 On this third level, criticism is more radical and more global: it is not a
matter of failings which can be pinned on individual conduct such as
21 Madoff, or biases related to particular modelling tools (e.g. VaR), but
instead the challenging of the very foundations of the current concep-
23 tual framework, that is the paradigm.¹³

The philosophy of sciences, Kuhn (1983), which looks at the times
25 of crisis encountered by a science during its evolution, states that there
is a 'scientific revolution' when a scientific theory established by time –
27 forming a paradigm – is rejected to the benefit of a new theory – a
new paradigm.

29 At the present time, few finance researchers recognise themselves in
this level of questioning of the founding paradigm of modern finance;
31 they were mentioned above: M. Aglietta, E. Briys, P. H. Dembinski,
G. Giraud, P. Jorion, D. A. MacKensie, F. Morin, A. Orléan,
33 O. Pastre, H. Rainelli, R. Shiller, N. N. Taleb, among others, but
differences – or even significant divergences – exist between them, so
35 they cannot be seen as a united front.

We should not therefore be surprised by the permanent nature of
37 the so-called *mainstream* current, that is acceptance of the first level of
criticism and, to varying degrees, of the second level, in academic
39 finance today. This configuration of the scientific milieu can be illu-
strated by the awarding of the 2013 Nobel Prize for Economics to three

1 American academics, E. Fama and L. P. Hansen (both from the
 2 University of Chicago) and R. Shiller (Yale). As observers stated: *'The*
 3 *three winners are from different schools of thought: the first two are neo-*
 4 *classicists – supporting the rationality of economic agents – while the*
 5 *third is a believer in behavioural finance, considering that the rationality*
 6 *of economic agents is not systematic'.*

7 The Royal Swedish Academy of Sciences, which awards the prize,
 8 resorted to understatement to gloss over this disparity: *'The Laureates*
 9 *have laid the foundation for the current understanding of asset prices. It*
 10 *relies in part on fluctuations in risk and risk attitudes, and in part on*
 11 *behavioural biases and market frictions'.*¹⁴ We have rarely seen this kind
 12 of recognition of the plurality of conceptual frameworks for a single
 13 scientific goal.

15 **FOR A REAL REFORM OF FINANCE**

16
 17 My proposal is based on two complementary lines: of interest respectively
 18 for the academic world (for a new paradigm) and for the professional
 19 sector (for reembeddedness); I will then bring these two lines together in a
 20 conclusion on the training of financial experts.

23 *For a New Paradigm in Finance*

24
 25 I base my belief on the critical assessments described above and come to
 26 the conclusion that this is where we are at in finance today. The dominant
 27 paradigm, formed in the 1950s by the founding works of Markowitz,
 28 Tobin and Modigliani and Miller, despite the immense developments which
 29 it has engendered, despite the ten or more Nobel Prizes for Economics
 30 marking its history, is currently reaching exhaustion because it just cannot
 31 address the issues raised by the current financial crisis, problems for which
 32 it is partially responsible.¹⁵ It is no longer a matter of adding another
 33 storey to the impressive construction built over fifty years ago and which
 34 has now become a 'giant with clay feet', but instead a question of overhauling
 35 the entire structure, starting with the foundations. *In brief, contemporary*
 36 *finance needs a new paradigm.*

37
 38 The definition of this new paradigm should be considered within the
 39 framework of a collective programme. However, we can explore several
 avenues that appear useful to the debate:

- 1 – reembedding finance within HSS, leaving behind pipe dream of a separate discipline comparable to physical sciences. In this respect, we need
 3 to accept the contingency of facts and financial behaviour, calling for a distinction according to the economic, legal, political and cultural environments in the societies that produce them and to which those facts and
 5 behaviour contribute
- 7 – expanding the analysis framework – especially risk analysis – to include elements other than price, rates and random variations of those prices
 9 and rates
- 11 – turning to formalisation as one path (among others) to analysis. In this formalisation, the current range of tools used (actuarial principles and probabilities) should be expanded to take in other mathematical tools
 13 (games theory, fractals, etc.)

15

For the ‘Reembeddedness’ of Finance in Society

17

19 The diagnosis, made by researchers and observers of contemporary finance, is almost unanimous. Apart from some minor differences in style, all these authors consider that the current crisis is linked to the huge emphasis
 21 placed on finance compared to the rest of the economy. I can quote a few examples from recent works:

23

25 – Simon (2014) reminds us that ‘*the crisis which erupted in finance in 2008 affected the entire world economy*’ (p. 8) but despite that ‘*finance, which is at the root of the crisis, is still more powerful than it was in 2008*’ (*ibid.*).

27

29 – Durand (2014) considers that ‘*finance develops according to its own specific dynamic*’ (p. 7) and talks about the ‘*financial eruption*’ (p. 11). In his view, ‘*the accumulation of fictive capital inevitably causes the crisis*’ (p. 69).

31

33 – Lagoarde-Segot (2014) highlights ‘*the financial aspects of financialisation*’ (pp. 28–31): the concentration of banking risks, the explosion of financial transactions, increased securitisation and the boom in ‘*shadow banking*’.

35

37 – Giraud (2014) makes a similar observation by insisting on the malfunctions inherent to the financial markets (chap. 3) and the banks’ *ex nihilo* power of monetary creation (chap. 5), a power increased by policies such as quantitative easing led by the central banks (*ibid.* and chap. 6)

39

As rightly pointed out by Fimbel and Karyotis (2012), referring to the approaches of K. Polanyi and M. Granovetter, ‘*ideologically, the financial*

1 *sphere has conquered self-referential power by embedding the economic*
 2 *realm, which had itself previously embedded society'* (op. cit., p. 539).

3 The solutions put forward are diverse but converge, except for C. Durand
 4 who is pessimistic about the 'lead blanket of fictive capital' (p. 192) and
 5 what looks like a dead-end, but other authors put forward solutions or at
 6 least avenues to be explored. For example, C. Simon and G. Giraud echo
 7 the demands for a separation of commercial and speculative banking activ-
 8 ities, a cap on the size of the biggest players in the sector and a tightening
 9 of the rules, the Tobin tax and so on. G. Giraud goes further by stating his -
 10 support for more drastic solutions such as the 'SMART currency'.
 11 Th. Lagoarde-Segot backs 'a reform of knowledge on the basis of ethical
 12 considerations', and states that 'the development of the solidarity economy
 13 is a real opportunity in response to this kind of challenge' (op. cit., p. 172).

14 Even though the books quoted here are recent, they were not the first to
 15 draw the public's attention to the current financial crisis and its effects on
 16 the global economy. On the contrary, in a previous listing, I noted that 'the
 17 only sector to sail through the crisis was research and publication on the
 18 crisis'. However, despite these repeated warnings and the array of proposals
 19 for action put forward by various bodies – in particular, *Finance*
 20 *Watch* – we can see that little has really changed for the financial realm
 21 where, apart from a few affairs seen as isolated incidents (Madoff, Kerviel,
 22 etc.), it is pretty much 'business as usual'.

23 Why are stakeholders in finance failing to take appropriate action?
 24 Beyond the belief that many of these stakeholders might hold as to the rela-
 25 tive superiority of the current system which, for them, is like democracy in
 26 that it is 'the least bad option', and beyond the performativity effects
 27 pointed out by several previous authors, in my view, the cause lies quite
 28 simply in the stakeholders' resistance to any initiative likely to rein in their
 29 power. In this respect, I hereby share the opinion of my colleague,
 30 A. Cartapanis in his afterword to the book by Th. Lagoarde-Segot: '*finance*
 31 *is also a power ... and this power, which is backed by some powerful lobbies,*
 32 *is not ready to let go of its position in the economy'* (op. cit., p. 177).

33 To apply a formula in the style of Polanyi-Granovetter, used by Fimbel
 34 and Karyotis (2012), we need to proceed with a dual *reembeddedness* of
 35 finance in the economy and economy in society.

37

Conclusion: For a Reform of Financial Training

39

I feel it would be appropriate to close this 'waypoint' review with a word
 on the training of financial stakeholders, especially traders who work in

1 the front office on the international markets. As we know, the majority of
2 these professionals are prepared – dare I say – for their jobs in the finan-
3 cial industry with training in exclusively mathematical techniques.¹⁶ This
4 has two unfortunate consequences:

- 5 • it consolidates the idea that finance is, like physics and chemistry a
6 separate science that can be controlled using appropriate modelling
7 techniques;
- 8 • it trains a pool of financial decision-makers who are often young with no
9 experience of economic and corporate life, and no training in law, eco-
10 nomics, management, or more generally, the HSS to prepare them for
11 their future profession. As for a course on ethics ...

12
13 Alongside the new finance paradigm that I would like to see emerge, finan-
14 cial training also has to be overhauled.

15 Again, I will make do with a brief outline here: all ‘master’s in finance’
16 courses should include:

- 17 • basic training in the ‘anthropology of finance’: – a course based on the
18 work of economics anthropologists/sociologists (Dumont, Godelier,
19 Levi-Strauss, Polanyi, etc.) and historians (Braudel, Wallerstein, etc.);
- 20 • substantial training in international economics, law (commercial law)
21 and management (businesses and organisations);
- 22 • knowledge of tools and languages (mathematics, statistics, information
23 systems, including accounts and internal control), and the ‘decoding’ of
24 their conceptual bases and how they are used;
- 25 • special modules on:
 - 26 ◦ epistemology and methodology,
 - 27 ◦ the psycho-sociology of decision-making,¹⁷
 - 28 ◦ professional conduct and business ethics.

29
30 The main thing to be learned from the global financial and economic
31 crisis may be that the most advanced societies need to take a good look at
32 themselves, the meaning of their actions and the education of their
33 members.

34 It is time for those who share these ideas to combine their efforts,
35 not only to advance the analysis of the issues related to the ‘financial
36 flood’, but also to prepare viable solutions to address it and, last but
37 not least, muster enough weight to help implement those solutions. The
38 idea of working together, recommended by Lin Ostrom, appears to
39 the prerequisite enabling us to look ‘beyond fatal financial logic’ and
one day reply ‘I can see the almond tree blossom’ (G. Giraud, *op. cit.*,
p. 248).

NOTES

1. Sometimes referred to as ‘classic finance’ or ‘institutional finance’ or even ‘folklore’ by M. Jensen who has no hesitation in discrediting his opponents (see below).

2. N.B. Do not confuse Merton (1910–2003), sociology professor at Columbia, with his son Merton (1944–...), finance professor at MIT (and later Harvard), well known in finance for having developed, around the same time as F. Black and M. Scholes, the Theory of Rational Option Pricing, an important step forward for scientific finance, which earned them the Nobel Memorial Prize in Economic Sciences in 1997. Anecdotally, when the Nobel prize was awarded, R. C. Merton rounded off his speech with a quote qualifying the LTCM investment fund he founded with Scholes and other renowned researchers, as ‘*the best finance faculty in the World*’ (ref. speech on www.nobelprize.org). This was less than a year before the fund’s spectacular collapse, leading to a bail-out under the supervision of the Federal Reserve to prevent a chain reaction.

3. R. Goffin’s work begins with the idea that ‘a sum is risky if that sum is a random variable where we know the probability distribution’ (Goffin, 1998, p. 13).

4. It is significant that in the second edition of *Encyclopédie de la gestion* (Management Encyclopaedia), market finance was taken out and included in its own *Encyclopédie des marchés financiers* (Encyclopaedia of Financial Markets).

5. I purposely use this expression often applied by M. C. Jensen and the modern finance proponents who hammer home the self-proclaimed scientificness of their approach compared to others. M. C. Jensen does not shy from controversy and has repeatedly rubbished his critics and, declared himself as a defender of ‘the Science!’ On the issue of takeovers (Jensen, 1984), he contrasted ‘science’ (himself) with ‘folklore’ (the others). Likewise, his argument on the ‘market for corporate control’ (Jensen & Ruback, 1983) was ‘*the scientific evidence*’. In his criticism of the ‘stakeholders’ approach (Jensen, 2001), he goes even further, caricaturizing Freeman and widening the circle of stakeholders to ‘*terrorists, blackmailers and thieves*’. For him, the multivariate approach required by the notion of ‘stakeholders’ is worthless: ‘*Multiples Objectives is no Objective*’. On the other hand, his position – maximising market value – is based on a long academic tradition, and is therefore true ‘*Two hundred years of work in economics and finance implies that ... social welfare is maximized when each firm in an economy maximizes its total market value*’.

6. ‘*One item left out of the debate on financial models is their impact on reality. In fact, this was not left out but indeed theorised by a Scottish sociologist, Donald MacKenzie, in his work “an engine, not a camera” where he presents the history of financial theory according to Markowitz. He shows how Markowitz and Modigliani-Müller took financial theory in a resolutely anti-institutional and mathematical direction, clearly marked by Friedmann’s epistemology. He shows how these new financial theorists were driven by the very rapid development of financial markets which created a demand for evaluation methods. However, on a more fundamental level, his demonstration showed that models shaped the reality of financial markets (which explains his title, “an engine, not a camera,” or so goes the theory)*’ (Rainelli, 2009, correspondence with the author).

1 7. *'The portfolio management models, and even more so option pricing models, are*
 3 *not only models giving a representation of the market. They are prescriptive and*
 5 *performative. They tell you what to do on that market and shape market reality'*
 (M. Amatte, comment on N. EL Karoui's presentation, 2009).

8. The amount of positions on the credit default swaps (CDS) came to US\$50
 trillion in 2008, equivalent to global GDP – with US\$17 trillion for JP Morgan
 alone.

9. The collapse of Lehman Brothers is a counter-example, justifying the rule;
 observers agree that the supervisory authorities should have intervened as they did
 several years earlier for the LTMC fund or American saving banks.

10. The degree of variety of the control system will at least be equal to that of
 the system controlled (Ashby, 1958; Mesarovic et al., 1970).

11. See the chapter on 'Asset-backed securities' in the essay by Lederman (1987),
 and the chapter on 'Securitisation: Economic and financial analysis' by Simon and
 Lautier (2009).

12. More specifically, in the realm of ABS, the securities backed by mortgages,
 such as subprime mortgages, make up a category known as *Residential Mortgage*
Backed Securities (RMBS).

13. 'What I call paradigms are the universally recognised scientific discoveries
 17 which, for a time, provide the researcher community with typical problems and
 solutions' (Kuhn, 1983, p. 11).

14. [http://www.lemonde.fr/economie/article/2013/10/14/le-nobel-d-economie-cour-
 one-trois-americains-pour-leurs-travaux-sur-les-marches-financiers_3495345_3234.
 html#BFm1DZv51drkVv68.99](http://www.lemonde.fr/economie/article/2013/10/14/le-nobel-d-economie-cour-

 19 one-trois-americains-pour-leurs-travaux-sur-les-marches-financiers_3495345_3234.

 html#BFm1DZv51drkVv68.99)

15. *'As such, the defence of mathematical finance, according to which it has no*
 21 *responsibility in the formation of bubbles, needs to be balanced. It is true that bubbles*
 23 *were formed before mathematical finance was established. However, it is also true that*
 25 *various forms of drift have rocked the boat on a number of occasions in the past.*
Mathematical financial theory is the matrix that has, at least to a certain extent,
allowed for the recent explosion in financial innovations, or new forms of drift'
 (Rainelli, 2009, correspondence with the author).

16. The Ecole Polytechnique Master's in 'Probabilities and Finance' at Paris 6
 University (Ms. El Karoui) is the reference training programme for traders, much
 sought after by fund managers in France and abroad.

17. To refer to a note already mentioned above, training for financial stake-
 holders has as much to learn from Merton, 1948 (*The Self-Fulfilling Prophecy*) as
 Merton, 1973 (*Theory of rational option pricing*). We can imagine the father giving
 his 'Nobel' son a lesson in psychology after the collapse of the LTCM fund in 1998.

18. See FAS programme summary report and bibliography.

ACKNOWLEDGEMENTS

This chapter is a new, updated and extended version of a paper published
 in 2010 (Pérez R., 2010). At that time, I wrote: 'This paper is not

1 a completed work (insofar as research can be considered complete) but a
2 waypoint in an ongoing research programme. This programme has been
3 provisionally entitled “For a new paradigm in finance.” My feeling is that
4 the current paradigm, devised in the 1950s by the pioneering work of
5 Markowitz, Tobin and Modigliani & Miller is now “exhausted” (in the
6 meaning defined by Kuhn), as evidenced by the current global financial
7 crisis. It is therefore necessary to start working on a new paradigm, a task
8 that will involve reasoned criticism of the current paradigm. Our research
9 is part of this critical process. A certain amount of preliminary work has
10 already been done’.

11 Subsequently, an international research programme entitled ‘Finance
12 and Sustainability’ (FAS) was devised in 2009 with a view to a contribution
13 at the 10th IFSAM World Conference in Paris in July 2010. It was coordi-
14 nated by a researchers’ collective – R. Pérez (U. Montpellier, France),
15 C. Louche (Vlerick Gent-Leuven, Belgium), W. Sun (Leeds Met U.,
16 UK) – brought together on the basis of a partnership between two
17 networks – RIODD (Réseau international de recherche sur les organisa-
18 tions et le Développement Durable) and CGSIG (Corporate Governance
19 and Sustainability International Group), in liaison with a number of other
20 institutions including CRIFA (Club recherche de l’Institut français des
21 administrateurs), FIR (Forum de l’Investissement responsable – French
22 SIF) and ISMEA (Institut de sciences mathématiques et économiques
23 appliquées). Over the last few years, the members of the FAS collective
24 have taken part in a number of scientific meetings and events organised
25 either within the programme framework of on the initiative of partner
26 institutions.

27 This joint project has resulted in several publications, including a new
28 ‘Entreprise et finance’ series (KF), derived from the K series ‘Economie de
29 l’entreprise’ by the review *Économies et Sociétés* (ISMEA) and the first col-
30 lective work in a dedicated series from Emerald Publishing: Sun, Louche,
31 and Pérez (2011).¹⁸

32 As the author, I would like to thank everyone who has encouraged me
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REFERENCES

- 1
- 3 Aglietta, M. (1997). *Régulation et crises du capitalisme* (2nd ed.). Paris: Editions Odile Jacob.
- 4 Aglietta, M., & Rebérioux, A. (2004). *Dérives du capitalisme financier*. Paris: Albin Michel.
- 5 Akerlof, G. A., & Shiller, R. J. (2009). *Animal spirits: How human psychology drives the economy and what it matters for global capitalism*. Princeton, NJ: Princeton University Press.
- 7 Ashby, W. R. (1958). *Introduction à la cybernétique*. Paris: Dunod.
- 8 Berger, P., & Luchmann, T. (1966). *The social construction of reality*. New York, NY: Doubleday.
- 9 Bignon, V., Biondi, Y., & Ragot, X. (2009). *Une analyse économique de la "juste valeur": La comptabilité comme vecteur de crise*. Prisme n° 15, Paris: Centre Cournot pour la recherche en Economie.
- 11 Black, F., & Scholes, M. (1973). The pricing of options and corporate liabilities. *Journal of Political Economy*, 81(3), 637–654.
- 13 Bourguinat, H., & Briys, E. (2009). *L'arrogance de la finance*. Paris: La Découverte.
- 15 Braudel, F. (1967–1979). *Civilisation matérielle, économie et capitalisme*. Paris: Flammarion.
- 16 Capron, et al. (2005). *Les normes comptables internationales, instruments du capitalisme financier*. Paris: La Découverte.
- 17 Casta, J.-F., & Colasse, B. (coord.) (2001). *Juste valeur: Enjeux techniques et politiques*. Paris: Economica.
- 19 Chambost, I., & Touchelay, B. (Eds.) (2013). L'information économique et financière des salariés et de leurs représentants. Special issue, *Economies et sociétés (cahiers de l'ISMEA)*, *Entreprise et finance (KF3)*, 47(8), 1217–1419.
- 21 Charreaux, G. (2008). La recherche en finance d'entreprise: quel positionnement méthodologique? *Finance Contrôle Stratégie*, 11, 237–290.
- 23 Colasse, B. (2009). La normalisation comptable internationale face à la crise. *Revue d'Economie Financière*, 95, 387–399.
- 25 Cuillerai, M. (2002–2009). *Spéculation, éthique, confiance*. Paris: Payot & Rivages.
- 26 Dembinski, P. H. (2008). *Finance servante ou finance trompeuse*. Genève: Desclée de Brouwer.
- 27 Durand, D. (2014). *Le capital fictif*. Paris: Les prairies ordinaires.
- 28 El Karoui, N. (2009, November). *Un moment de l'expérience probabiliste. Théorie des processus stochastiques et pratiques dans les marchés financiers*. Prisme n° 17, Paris: Centre Cournot pour la recherche en Economie.
- 29 Fama, E. F. (1970). Efficient capital markets: A review of theory and empirical work. *Journal of Finance*, 25(2), 383–417.
- 31 Fama, E. F., & French, K. R. (1996). Multifactors explorations of asset pricing anomalies. *Journal of Finance*, 51(1), 55–84.
- 33 Fimbel, E., & Karyotis, C. (2012). Titrisation et réflexo-génèse. *Economies & Sociétés, (KF2)*, 46(3), 527–551.
- 35 Fisher, I. (1907). *The rate of interest*. New York, NY: Macmillan.
- 36 Forum on the network. échanges autour des biens communs. Available at finance@bienscommuns.org (moderators: Alix N., Pérez R. & Sultan F.).
- 37 Gauchet, M. (1985). *Le désenchantement du monde*. Paris: Gallimard.
- 38 Giraud, G. (2014). *L'illusion financière*. Paris: Les éditions de l'atelier.
- 39 Giraud, G., & Renouard, C. (2009). *20 Propositions pour réformer le capitalisme*. Paris: Flammarion.
- Goffin, R. (1998). *Principes de finance moderne*. Paris: Economica.

- 1 Granovetter, M. (1985). Economic action and social structure: The problem of embeddedness. *American Journal of Sociology*, 91(3), 1360–1380.
- 3 Hacking, I. (2001). *Entre science et réalité: la construction sociale de quoi?* Paris: La Découverte.
- 5 Herlin, P. (2008). *Théorie des marchés financiers: Revenir aux concepts fondamentaux*. Club Finance HEC, Etudes n° 75.
- 7 Huault, I., & Rainelli-Le Montagner, H. (2009). Market shaping as an answer to ambiguities: The case of credit derivatives. *Organization Studies*, 30(5), 549–575.
- Jensen, M. C. (1984). Takeovers: Folklore and science. *Harvard Business Review*, 62, 109–121.
- 9 Jensen, M. C. (2001). Value maximization, stakeholder theory and the corporate objective function. *Journal of Applied Corporate Finance*, 14(3), 8–21.
- Jensen, M. C., & Meckling, W. H. (1976). Theory of the firm: Managerial behavior, agency costs and ownership structure. *Journal of Financial Economics*, 3(4), 305–360.
- 11 Jensen, M. C., & Ruback, R. S. (1983). The market of corporate control: The scientific evidence. *Journal of Financial Economics*, 11, 5–50.
- 13 Jensen, M. C., & Smith, C. W. (Eds.) (1984). *The modern theory of corporate finance*. New York, NY: Mc Graw-Hill.
- 15 Jorion, P. (2008). *La crise. Des subprimes au séisme planétaire*. Paris: Fayard.
- Knight, F. (1921). *Risk, uncertainty and profit*. New York, NY: M. Kelley.
- 17 Kuhn, T. (1983). *La structure des révolutions scientifiques*. Paris: Flammarion.
- Lagoarde-Segot, T. (2014). *La finance solidaire: Un humanisme économique*. Bruxelles: De Boeck.
- 19 Le Moigne, J.-L. (1994–1995). *Le constructivisme* (Vol. 2). Paris: ESF Ed.
- Lederman, J. (1987). *Handbook of mortgage banking*. Chicago, IL: Probus Publ.193.
- 21 Levasseur, M. (1976). *Le comportement des entreprises industrielles en matière de trésorerie*. Thèse. Université Paris Dauphine, Paris.
- 23 Levi-Strauss, C. (1950). Introduction à l'oeuvre de Marcel Mauss. In M. Mauss (Ed.), *Sociologie et anthropologie*. Paris: PUF.
- 25 Louche, C., & Hebb, T. (Eds.) (2014). *Socially responsible investment in the 21st century: Does it make a difference for society?* Critical Studies on Corporate Responsibility, Governance and Sustainability (Vol. 7). Bingley, UK: Emerald Group Publishing.
- 27 MacKenzie, D. A. (2006). *An engine, not a camera, social studies in finance*. Cambridge, MA: The MIT Press.
- 29 Mandelbrot, B. (1973). Formes nouvelles du hasard dans les sciences. *Economie appliquée*, 26, 307–319.
- Mandelbrot, B. (1997). *Fractals and scaling in finance: Discontinuity, concentration and risk*. Springer. **AU:7**
- 31 Mandelbrot, B., & Hudson, R. (2005). *Une approche fractale des marchés: Risquer, perdre et gagner*. Paris: Ed. Odile Jacob.
- 33 Markowitz, H. (1952). Portfolio selection. *The Journal of Finance*, 7(1), 77–91.
- Marteau, D., & Morand, P. (2009). *Normes comptables et crise financière: propositions pour une réforme du système de régulation comptable*. Paris: La Documentation Française.
- 35 Martinet, A.-C. (2008). Gouvernance et management stratégique. *Revue Française de Gestion*, 183, 93–110.
- 37 Merton, K. C. (1948). The self-fulfilling prophecy. *Antiech Review, Summer*, 193–210. Also published in *Social Theory and Social Structure*. New York, NY: Free Press, 1949.
- 39 Merton, R. C. (1973). Theory of rational option pricing. *Bell Journal of Economics*, 4(1), 141–183.
- Mesarovic, M. D., et al. (1970). *Theory of hierarchical, multilevel, systems*. London: Academic Press. **AU:8**

- 1 Modigliani, F., & Miller, M. (1958). The cost of capital, corporation finance and the theory of investment. *American Economic Review*, 48, 261–297.
- 3 Morin, F. (2006). *Le nouveau mur de l'argent: Essai sur la finance globalisée*. Paris: Seuil.
- Myers, S. C. (1977). Determinants of corporate borrowing. *Journal of Financial Economics*, 6(5), 147–175.
- 5 Myers, S. C., & Majluf, N. (1984). Corporate financing and investments decisions when firms have information that investors do not have. *Journal of Financial Economics*, 13, 187–221.
- 7 Ninet, J., Pérez, R., & Zimnovitch, H. (Eds.) (2012). Banques et crise financière. Special issue, *Économies et sociétés (cahiers de l'ISMEA)*, *Entreprise et finance (KF2)*, 46(3), 493–584.
- 9 Orléan, A. (1999). *Le pouvoir de la finance*. Paris: Ed. O. Jacob.
- 11 Paraque, B. (Ed.) (2014). Financement; management et gouvernance des entreprises de l'économie sociale et solidaire. Special issue, *Économies et sociétés (cahiers de l'ISMEA)*, *Entreprise et finance (KF4)*, 48(7), 1097–1197.
- 13 Pastre, O., & Sylvestre, J.-M. (2008). *Le roman vrai de la crise financière*. Paris: Ed. Perrin.
- Pérez, R. (1973). Une étude théorique de l'endettement dans le calcul économique. *Economies et Sociétés*, 8(4), 581–646.
- 15 Pérez, R. (2003–2009). *La gouvernance de l'entreprise*. Paris: La Découverte.
- 17 Pérez, R., Louche, C., & Sun, W. (Eds.) (2010). Finance responsable. Special issue, *Économies et sociétés (cahiers de l'ISMEA)*, *Entreprise et finance (KF1)*, 44(11), 1705–1883.
- Perroux, F. (1960). *Le capitalisme*. Paris: PUF.
- 19 Plihon, D. (2003–2009). *Le nouveau capitalisme* (3rd éd.). Paris: La Découverte.
- Polanyi, K. (1944–1983). *La grande transformation*. Paris: Gallimard. traduction de la 2e éd, 1972, de *The Great Transformation*.
- 21 Rainelli, H. (2008). Nouveaux chantiers de la finance. In G. Schmidt (coord.), *Le management* (pp. 175–183). Auxerre: Sciences Humaines Editions.
- 23 Rappaport, A. (1987). *Creating shareholder value: The new standard for business performance*. New York, NY: The Free Press.
- 25 Richard, J. (2012). *Comptabilité et développement durable*. Paris: Economica.
- Ross, S. A. (1977). The determination of financial structure: The incentive-signalling approach. *Bell Journal of Economics*, 8(1), 23–40.
- 27 Roux, M. (2005). *Finance éthique*. Paris: RB Editions.
- Servet, J.-M. (2012). *Les monnaies du lien*. P. U. L. Lyon.
- 29 Servet, J.-M. (2015). *La vraie révolution du micro-crédit*. Paris: Éd. Odile Jacob.
- Sharpe, W. (1964). Capital asset prices: A theory of market equilibrium under conditions of risk. *Journal of Finance*, 19(3), 425–442.
- 31 Shiller, R. (2000). *Irrational exuberance*. Princeton, NJ: Princeton University Press.
- 33 Simon, C., & Collectif Roosevelt (2014). *Stop à la dérive des banques et de la finance*. Paris: Les Editions de l'atelier.
- Simon, Y., & Lautier, D. (2009). Titrisation: Analyse économique et financière. In M. Boizard & P. Raimbourg (Eds.), *Ingénierie financière, fiscale et juridique* (pp. 689–715). Dalloz.
- 35 Sorman, G. (2008). *L'économie ne ment pas*. Paris: Fayard.
- 37 Soros, G. (1998). *La crise du capitalisme mondial*. Paris: Plon. trad. Fr. de *The crisis of Global Capitalism*.
- 39 Stout, L. (2009). *How deregulating derivatives led to disaster and what re-regulating them can prevent another*. Lombart Street, note FinReg 21th. Retrieved from www.finreg21.com
- Sun, W., Louche, C., & Pérez, R. (Eds.) (2011). *Finance and sustainability: Towards a new paradigm? A post-crisis agenda*. Critical Studies on Corporate Responsibility, Governance and Sustainability (Vol. 2). Bingley, UK: Emerald Group Publishing.

- 1 Sun, W., Steward, J., & Pollard, D. (Eds.) (2010). *Reframing corporate social responsibility: Lessons from the global financial crisis*. Critical Studies on Corporate Responsibility, Governance and Sustainability (Vol. 1). Bingley, UK: Emerald Group Publishing.
- 3 Sun, W., Steward, J., & Pollard, D. (2011). *Corporate governance and the global financial crisis: International perspectives*. Cambridge: Cambridge University Press.
- 5 Taleb, N. N. (2006). *La puissance de l'imprévisible*. Paris: Les Belles Lettres.
- Thom, R. (1972). *Stabilité structurelle et morphogénèse*. Paris: InterEditions.
- 7 Thom, R. (1983). *Paraboles et catastrophes*. Paris: Flammarion.
- Tirole, J. (2006). *The theory of corporate governance*. Princeton, NJ: Princeton University Press.
- 9 Tirole, J. (2008). *Leçons d'une crise*. Notes TSE – n° 1, déc., Toulouse S.E., Toulouse.
- Tobin, J. (1956). Liquidity preference as behavior towards risk. *Review of Economic Studies*, 26(1), 65–86.
- 11 Urban, S. (2008). Financial markets' expectations and human development. *Society and Business Review*, 3(2), 162–171.
- 13 Van Frederisklut, R. A. I., et al. (Eds.) (2008). *Corporate finance and corporate governance: A European perspective*. London: Routledge.
- 15 Vieille, J.-N. (2012). *Valorisation des entreprises en temps de crise*. Paris: Economica.
- Wallerstein, I. (1985). *Le capitalisme historique*. Paris: La Découverte.
- 17 Walter, C. (2009). Le virus Brownien et la dérouté des professionnels en finance. In C. Turgot (Ed.), *Repenser la planète finance* (pp. 89–101). Paris: Les Echos-Eyrolles Edition.
- 19 Walter, C., & de Pracontal, M. (2009). *Le virus B. Crise financière et mathématiques*. Paris: Seuil.
- Weber, M. (1964–1904). *L'éthique protestante et l'esprit du capitalisme*. Paris: Plon.


21

23 UNCITED REFERENCES

AU:5

- 25 Aglietta (1997); Aglietta and Reberieux (2004); Akerlof and Shiller (2009); Berger and Luchmann (1966); Braudel (1967–1979); Chambost and Touchelay (2013); Charreaux (2008); Cuillerai (2002–2009); Dembinski (2008); Fama and French (1996); Forum on the network; Giraud and Renouard (2009); Granovetter (1985); Hacking (2001); Herlin (2008); Huault and Rainelli-Le Montagner (2009); Jensen and Smith (1984); Jorion (2008); Knight (1921); Louche and Hebb (2014); Mandelbrot and Hudson (2005); Martinet (2008); Morin (2006); Ninet, Pérez, and Zimnovitch (2012); Paranque (2014); Pastre and Sylvestre (2008); Pérez, Louche, and Sun (2010); Perroux (1960); Plihon (2003–2009); Polanyi (1944–1983); Rappaport (1987); Richard (2012); Roux (2005); Servet (2012); Servet (2015); Shiller (2000); Simon and Collectif Roosevelt (2014); Stout (2009); Sun, Steward, and Pollard (2010); Sun, Steward, and Pollard (2011); Taleb (2006); Tirole (2008); Urban (2008); Van Frederisklut and alii (2008); Vieille (2012); Wallerstein (1985); Walter (2009); Weber (1964–1904)

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