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Muriel Dal-Pont Legrand
Harald Hagemann

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Can Recessions be “Productive”?  
Schumpeter and the Moderns*  

Muriel Dal Pont Legrand$^1$ and Harald Hagemann$^2$

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Abstract. Joseph A. Schumpeter never ceased to inspire new generations of economists. One of his major contributions concerns his view of business cycles and economic development as closely interrelated dynamics. Among the different lines of research proposed by Schumpeter in order to allow economists to capture how growth and cycle dynamics intertwine, one can find the analysis of the investment decisions during recessions. Schumpeter considered this process of Creative Destruction as “the essential fact about capitalism” since the Industrial Revolution. According to him, the process of liquidation and reallocation of productive resources taking place in the recession and particularly in the depression phase is not only an essential and unavoidable characteristics of capitalist evolution, but also necessary and, finally, beneficial for long-run development. More recently, one can notice in the literature a revival of interest for these questions. This line of research has been developed again in the 1990s by Aghion and Saint-Paul (1991, 1993, 1998) and Saint-Paul (1994) but also Caballero and Hammour (1994, 1996). They elaborated the so-called “productive recessions” analysis respectively the “cleansing effect” of recessions. Focusing exclusively on neo-Schumpeterian contributions which explicitly analyze the impact recessions can have on growth, our purpose is to examine the mechanisms involved in the modern literature mentioned above and to compare them with Schumpeter’s original writings. The objective of this paper is to question the ‘Schumpeterian character’ of this recent literature and then to investigate the degree of continuity as well as the differences. Some focus will be on potential differences with regard to economic policy.

JEL Codes: B31, O11, O31, O47

Keywords: business cycles, growth, creative destruction, productive recessions, Schumpeter.

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$^1$ University Nice Sophia Antipolis and GREDEG CNRS.  
$^2$ University of Hohenheim, Stuttgart. Contact: harald.hagemann@uni-hohenheim.de
1. Introduction

Joseph A. Schumpeter is one of the grandmasters in economics who never ceased to inspire new generations of economists. One of his major contributions concerns his view of business cycles and economic development as closely interrelated dynamics, a position which led him to be highly critical of most of the econometric studies (Schumpeter 1931) and theoretical approaches which tried to identify and then distinguish these two dynamic issues.

Among the different lines of research proposed by Schumpeter in order to allow economists to capture how growth and cycle dynamics intertwine, one can find the analysis of the investment decisions during recessions. This line of research has been developed in the 1990s by Aghion and Saint-Paul (1993, 1998) and Saint-Paul (1994), developing then the so-called “productive recessions” analysis. At this time, debates which emerged on the positive impact recessions could have on growth dynamics, were deeply rooted in the development of the New Growth Theory (NGT) literature which proposed different endogenous growth mechanisms in order to (better) explain the origins of growth. King and Rebelo (1988) and Stadler (1990) were the first who pointed out that the N.G.T. framework may be used in order to analyse growth-cycles dynamics since "Endogenous technical change acts as a propagation mechanism for shocks that have only transitory effects in conventional models." (Stadler 1990, p. 777).

Then various papers came to question the nature (positive or negative, transitory or permanent) of the impact recessions can have on growth, opposing most often learning by doing to learning or doing growth-based models.\(^3\) In this line of research, Aghion and Saint-Paul\(^4\) produced an opportunity costs model which was intensively discussed both because of the simplicity and then tractability of the model as well as for its rather provocative analysis of the role of recessions\(^5\).

One can also mention the very interesting contributions by Caballero and Hammour, (specifically 1994 a, 1994b and 1996), which respectively focus on the cleansing effect which appears during recessions as well as on the process of creative destruction.

\(^3\) In the literature, the learning by doing mechanism is traditionally associated to Arrow’s tradition while the learning or doing mechanism refers to the Schumpeterian approach of investment during recessions. We develop debates opposing these literatures in the last section of this paper.

\(^4\) One can mainly identify four publications by Aghion and Saint-Paul in (1991), (1993) and (1998) and by Saint-Paul (1994).

\(^5\) One can here mention other contributions which were important at that time.
Caballero and Hammour (1994a and 1996) focus on growth-enhancing activities during recessions. Mainly pointing at the reallocation process on the job market, the authors nevertheless do not rely on an OC approach but rather examine what can be at the origins of market malfunctioning, disrupting the process of creative destruction.

Caballero and Hammour (1994b) proposes what seems to be a kind of ‘liquidationist’ view examining under which conditions a cleansing effect can have a positive impact on growth. They also investigate the response of industries to cyclical variations in demand. More recently, one can notice the revival of those questions. Some of those contributions specifically address the issue of the pro-cyclicality of R&D investment decisions and then question the Schumpeterian character of recessions.

Focusing exclusively on neo-Schumpeterian contributions which explicitly analyze the impact recessions can have on growth, our objective is to examine the mechanisms involved in the modern literature mentioned above and to compare them with Schumpeter’s original writings. Our purpose is to determine to what extent the different models investigating the productive character of recessions can be considered as ‘Schumpeterian’ developments. More precisely, even if some elements could be identified as part of a Schumpeterian research program, we propose to examine how the structure adopted by those models may have affected Schumpeter’s original message and possibly affected the debate on the nature of recessions as well as on the objective of economic policy. Some focus will be on potential differences with regard to economic policy.

The paper is organized as follows. Section 2 presents Schumpeter own view of the business cycle and growth dynamics. A large attention is then dedicated to the role recessions can have on growth as well as on the specific (Schumpeterian) phenomenon of creative destruction. Section 3 presents the modern literature and its general conclusions. Section 4 compares both views - Schumpeter’s one and neo-Schumpeterian ones - and discuss the implications those different approaches can have on the way economists consider economic policy, i.e. its necessity and its objective (growth policy versus stabilization policy) and opens discussions on the degree of continuity one can identify (or not) between those programs of research.

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6 We will see later in our last section that their conclusions differ from the so-called ‘liquidationist’ view.
2. Schumpeter’s ideas on recessions/depressions

“Analysing business cycles means neither more nor less than analysing the economic process of the capitalist era.” With this statement Schumpeter (1939, p. V) begins his monumental study *Business Cycles*, published at the end of the interwar period and after himself thinking on the subject for more than three decades. It is one of Schumpeter’s great merits to have emphasized the importance of integrating the study of business cycles with an analysis of long-run economic development which does not follow a steady-state or balanced growth path. From the very beginning it was central for Schumpeter that a theory of economic development has to be constructed as a theory of business cycles. Economic development initiated by the introduction of innovations by pioneering entrepreneurs and fostered by bank credit implies the concept of endogenous disturbance of equilibrium rather than exogenous impulses, such as wars and bad harvests, which would not explain the regularity of the phenomenon and the permanent struggle for a new equilibrium. Economic progress goes on in waves and crises are regarded as turning-points of economic development, an unavoidable consequence of the preceding prosperity and necessary for the process of re-equilibration and future progress and development.

As is well known, Schumpeter credited Clément Juglar for identifying the cyclical character of economic fluctuations and for having been seminal in the combination of theoretical, statistical, and historical analysis. Schumpeter (1931, p. 6) credited to Juglar “the discovery that what the former generations had called ‘crises’, were no disconnected events, but merely elements in a more deep seated wave-like movement. The Crises are nothing but turning points from prosperity into depression, and it is the alternation between prosperity and depression which is the really interesting phenomenon.” Schumpeter therefore saw Juglar’s great merits in pushing the crisis into the background and placing the problem of the cycle into the focus of attention instead. One can even find a quotation from Juglar which seems to have been created by Schumpeter himself since nobody so far was able to find it in Juglar’s original writings stressing that “the only cause of depression is prosperity” (1954, p.1124). The two authors shared then this view that the different phases of the cycles are deeply interrelated and that, without denying any role to impulsions (shocks), there are intrinsic

8 See Schumpeter (1939, pp. 162-3). For a detailed comparison of Juglar’s explanation of cyclical fluctuations with Schumpeter’s one see Dal-Pont Legrand and Hagemann (2007).
causes which are at the origin of fluctuations. Schumpeter and Juglar both considered the basic idea that cyclical fluctuations are an inherent characteristic of capitalist development which proceeds in a wavelike-movement. In Juglar one cannot detect the strict idea that recessions can have a restructuring role or that they stimulate innovation efforts but there is nevertheless the strong idea that recessions provide the natural and necessary adjustment of the economy what Schumpeter, still speaking about Juglar, synthetises this way: “depressions are nothing but adaptations of the economic system to the situations created by preceding prosperities and that, in consequence, the basic problem of cycle analysis reduces to the question what is it that causes prosperities – to which he failed, however, to give any satisfactory answer” (ibid. p. 1124).

In Juglar’s scheme of three phases prosperity is followed by a crisis, a crisis by depression, and depression by prosperity. Due to some asymmetry in the length of the subsequent phases, Juglar’s cyclical oscillations form a picture which does not comprise the symmetrical shape of sine curves which Schumpeter (1939) contains as ‘Juglar cycles’. Furthermore, whereas the cyclical fluctuations in Juglar are the consequence of excessive speculative behaviour which makes crises the necessary corrections of the economic system to adjust, in Schumpeter these cyclical fluctuations are caused by innovations.

In his 1914 Harvard lecture, which was intended to give his American audience a condensed version of his vision of the capitalist process, as put down in his *Theory of Economic Development (TED)*, Schumpeter (1914-15) emphasized already ‘The Wave-like Movement of Economic Life’ which is characterized by the succession of prosperity and depression. This is further elaborated in his *Business Cycles*, where Schumpeter (1939) now distinguishes four phases of economic fluctuations: prosperity, recession, depression and recovery, with two phases each moving away from respectively towards a state of equilibrium, and presents a three-cycle schema, in which Kondratieff long-waves constitute the framework where they are combined with the classical Juglar and the shorter Kitchin cycles. In the preface to the English edition of TED we find the following statement: “I took it for granted that there was a single wave-like movement, viz. that discovered by Juglar. I am convinced now that there are at least three such movements, probably more, and that the most important problem which at present faces theorists of the cycle consists precisely in isolating them and in describing the phenomena incident to their interaction. But this element has not been
introduced into the later editions” (1934, p. IX). This statement is not surprising because the Kitchin and the Kondratieff cycle were born in the economic literature only in the 1920s. Schumpeter himself was the co-editor of the journal in which Kondratieff’s famous article on “The long waves in economic life” was published in German in 1926. However, it is quite interesting to notice that the idea of superposition of different complexes of causality was already there when Schumpeter presented the main ideas on the wave-like fluctuation in economic activity to the Harvard faculty shortly before the outbreak of World War I.

The Business Cycle as a Superposition of Different Waves (3)

![Diagram of business cycles](image)

Source: Schumpeter (1939), p. 213.

The jerky character of economic evolution can hardly be denied and it is one of Schumpeter’s great merits to emphasize the importance of integrating the study of business cycles with an analysis of long-run economic development which does not follow a steady-state or balanced growth path. Innovations are not only the decisive impulse of cyclical fluctuations but the period of their implementation also determines the different length of the cycles. With some qualification with regard to the Kitchin the simultaneous presence of cycles of different order for Schumpeter “is a problem of interference only and not ... a problem of different causation“. Paraphrasing Marx one may argue: Innovate! Innovate! That is Moses and the prophets.
“Capitalism .. is by nature a form or method of economic change and not only never is but never can be stationary”, Schumpeter (1942, p. 82) states in Chapter VII on ‘The Process of Creative Destruction’ in his Capitalism, Socialism, and Democracy. Creative destruction is an integral part of the evolutionary process in a capitalist system and affects business cycles and economic growth alike. Schumpeter considered this process of Creative Destruction as “the essential fact about capitalism” since the Industrial Revolution. “The process as a whole works incessantly however, in the sense that there always is either revolution or absorption of the results of revolution, both together forming what are known as business cycles” (Ibid, p. 83). According to Schumpeter, the process of liquidation and reallocation of productive resources taking place in the recession and particularly depression phase is not only an essential and unavoidable characteristics of capitalist evolution, but also necessary and, finally, beneficial for long-run development.

“There is no reason to despair”, Schumpeter [1934] (1989, p. 116) states in 1934, four years after the Great Depression had started. Why did Schumpeter arrive at such a conclusion when the United States and other countries had not yet overcome the depression with its disastrous economic but also political consequences? Schumpeter’s answer is clear:

This is really at the bottom of the recurrent troubles of capitalist society. They are but temporary. They are the means to reconstruct each time the economic system on a more efficient plan. But they inflict losses while they last, drive firms into the bankruptcy court, throw people out of employment, before the ground is clear and the way paved for new achievement of the kind which has created modern civilization and made the greatness of this country (Ibid, p. 113).

Schumpeter believed in the “recuperative powers of capitalism” (Ibid, p. 110). In his view it is a main function of the economic cycle in capitalist development that both prosperity and depression are beneficial from an evolutionary perspective of capitalism. Depression periods, despite all their negative concomitants, exert a selective, i.e. positive function. Whereas in a boom period almost every stupid business man could make profits, i.e. “errors and misbehaviour should be abnormally frequent in
prosperity”, “everything that is unsound for either reason shows up when prices break and credit ceases to expand in response to decreased demand for it” (Ibid, p. 113).

Interestingly, Schumpeter’s reasoning has much in common with the one by Werner Sombart, his life-long rival who prevented Schumpeter’s appointment as Professor at the University of Berlin in 1931/32. When the third volume of Sombart’s Modern Capitalism was published in 1927, Schumpeter immediately wrote a long review article in which he praised Sombart for having been one of the first economists who had recognized the business cycle as the essential phenomenon of capitalist development and for considering the importance of credit creation for pioneering entrepreneurs without capital, but criticising Sombart for not distinguishing between interest on capital and entrepreneurial profit. In volume III of his Modern Capitalism (MK) Sombart (1927) focuses on high capitalism. Here he emphasizes the selective role of economic crises which only the fittest entrepreneurs will master:


“However, a mustering among entrepreneurs and firms takes place: Only the strongest remain alive, everything rotten, idle, weak, which was floating along in times of prosperity, disappears, the able, viable is preserved.”

There is not only a remarkable parallel between Schumpeter and Sombart in their Darwinian view of the survival of the fittest entrepreneurs in periods of depression, but also in their emphasis on the beneficial role of economic fluctuations for long-run development. Thus Sombart writes: “Segen über Segen, der für den Kapitalismus aus dem Dasein und Ablauf der Expansionskonjunktur fließt.” (Ibid, p. 586). “Blessing over blessing which flows for capitalism from the presence and the process of the expansion conjuncture.”

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9 For a more detailed investigation of Sombart’s analysis of capitalist development see Hagemann and Landesmann (1996).
In 1934 Schumpeter did not acknowledge the uniqueness of the ‘Great Depression’ but recognized the severity of the depression similar only to the two earlier ones in Britain in 1825 and the United States in 1873 with which he makes the comparison. Schumpeter recognized that special historical circumstances may aggravate the crisis, which is otherwise endogenous to the capitalist system: “that what we are faced with is never simply a depression but always a depression moulded and made worse by forces not inherent to the working of the economic engine as such” (Schumpeter [1934] 1989, p. 114). Among the non-economic causes in particular great wars, such as the Napoleonic ones, the Civil War in the U.S. and World War I, can play a dominant role.

3. The modern concept of “productive recessions”

The concept of “productive recessions” is known today as a typical Schumpeterian one, whereas Schumpeter himself never used such a vocabulary. He indeed deeply analysed the role recessions can have on growth, insisting on their cleansing effect as well as on the countercyclical character of efforts in R&D, both ideas being in fact encompassed within the creative destruction process. He then did not introduce any clear separation between those phenomena. On the one side, for Schumpeter, creative destruction does not always take place during recessions but is at least at the origin of the next recession. On the other side productive recessions are more naturally associated to creative destruction in the sense that they can generate a re-allocation process of factors of production and thereby a restructuring effect. It is interesting to notice that in the modern so-called ‘Neo-Schumpeterian’ literature, creative destruction and productive recessions are analysed as distinct issues, and within different models. We have decided here to focus our attention on models which explicitly analyse the impact recessions can have on growth\(^{10}\). Indeed, the Neo-Schumpeterian literature is quite large today, and it is impossible to cover the variety of all these contributions in one single paper. We then restrict the scope of our paper to the literature which specifically addresses the question of productive recessions. We have then identified two strands of literature: the first one has been developed by Aghion and Saint-Paul (1991, 1993, 1998) who analyse the condition(s) for recessions to be productive while the second line of contributions can be clearly identified with Caballero and Hammour (1994) and (1996) – or Aghion and Howitt (1998) but at a macro-level, \textit{i.e.} in an explicit growth model – who concentrated

\(^{10}\) This decision limits the scope of the paper and thereby excludes explicit growth models such as developed by Aghion and Howitt (1998).
on the *cleansing* and *restructuring* effects both induced *via* the creative destruction process.

\[ a. \text{ Opportunity cost approach} \]

The first class of models we consider here are the ones which have been developed by Aghion and Saint-Paul. Building on a *learning or doing* endogenous growth mechanism, Aghion and Saint-Paul (1991) show that recessions may be productive because they liberate resources used for production which then can be dedicated to R&D (since the production is less advantageous “in bad times”). These authors explicitly refer to Schumpeter, but when they quote him, without giving exact reference, only refer to Stiglitz’ earlier 1992 quotation as follows “[Recessions] are but temporary. They are the means to reconstruct each time the economic system on a more efficient plan”. (Aghion and Saint-Paul 1993, p. 11).

The model here is based on the Opportunity Cost (O.C.) approach which will then be used in different models\(^{11}\) and the idea is then to focus on investment decisions of firms over the cycle: a re-allocation process. The model is built on an intertemporal substitution mechanism: a (representative) firm has two sectors, one dedicated to Production Activities (PA) and the other one dedicated to Productivity Augmenting Activities (PAA), what we call later in the paper, research and development (R&D) sector. In other words, the firm has a fixed quantity of resources and faces a trade-off between short-run and long-run, *i.e.* taking an investment decision which improves present production or which, improving the productivity, will improve the future level of production. This trade-off exists because the firm is resource-constrained and, as we know, productivity-enhancing activities often are developed at the expense of production (manufacturing). One can see that the opportunity costs of the R&D activities will be pro-cyclical but we need to know whether these activities will also be pro-cyclical. In order to answer, we need to study their returns. It appears that the marginal returns\(^{12}\) will be higher in expansion than in recession, idem for the discounted value of the profits flows. Then, opportunity costs and profits of R&D activities are both pro-cyclical. Now the important point is that returns will be less pro-cyclical than

\(^{11}\) See Aghion and Saint-Paul (1991), (1993) and (1998) and also Saint-Paul (1994) for the theoretical contributions of that approach and Saint-Paul (1993) for an empirical support.

\(^{12}\) The marginal return of one unity equals the discounted value of the marginal returns flows generated by that unity.
the opportunity costs (Saint-Paul 1994). Indeed, in that kind of models, recessions are but temporary. This means that if at time $t$ the opportunity cost varies a lot, returns – because they are a discounted sum – are less affected and logically their variations are smaller, so that the impact on the firm's decision is lower. This mechanism leads firms - through intertemporal substitution - to concentrate the R&D activities during recessions.  

This also means that if negative macroeconomic shocks stimulate growth-enhancing investments, economic recessions should become shorter than they would be otherwise. So to some extent, cyclical fluctuations should allow the economy to grow faster at a lower (resource) cost.

This approach got some empirical support in the papers of Bean (1990) or Gali and Hammour (1991) since they “”(…) find evidence of a long-run negative effect of a positive demand shock on productivity, thereby emphasizing reallocation effects as more important than the pro-cyclical learning-by-doing (…) effect (…)” (Aghion and Saint-Paul 1993, p. 13).

Those empirical findings were nevertheless contradicted and are still discussed. Indeed, the question of the cyclicality of R&D activities has never ceased to be analyzed. More recently, Barlevy (2007) questions again the positive role recessions could play in fostering growth. He then explains that despite theoretical evidence that entrepreneurs should concentrate their innovations during recessions, it is clear that R&D is pro-cyclical. The objective of Barlevy (2007) is to provide insight which may help to understand why R&D seems to be pro-cyclical despite the existence of incentives which should make it countercyclical. It may be that other incentives vanish the OC effects or it may be that the OC approach is just simply irrelevant in order to understand the determinants of R&D decisions. Barlevy argues that there are

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13 Instead of paying attention to the innovation – market structure relationship, it is possible to focus on the innovation – financial markets imperfections relationship. Dal-Pont (2004) proposes a model where all investment is financed via credit extension characterised by credit rationing due to the asymmetric information hypothesis. It is then shown that credit-markets imperfections can have negative impacts on growth and then, counteract the productive character of recessions. In that context, monetary policy is not neutral anymore and finance may boost growth in smoothing intertemporal fluctuations through the credit channel. We can also note here that our approach, although elaborated in a totally different analytical framework, obtains conclusions similar to the ones of Stiglitz (1992). In that context, monetary policy is not neutral anymore and finance may boost growth in smoothing intertemporal fluctuations through the credit channel.
externalities inherent to R&D activities which induce their pro-cyclicality: mainly, entrepreneurs engage in R&D during recessions but wait for booms in order to implement their ideas. He then concludes that there is room for economic policy: allocation of public subsidies in order to sustain R&D during recessions. The question is the timing of the public decisions since in those models, by definition, recessions are temporary (and short), so public actors must be very active. More than that, their behavior could be predicted by firms which may totally annihilate their own efforts to finance R&D. If subsidies are not efficient instruments at all, then there may be again a greater role for stabilization policy when the cost macroeconomic volatility can have on growth can be evaluated. François and Lloyd-Ellis (2009) also propose to reconcile the Schumpeterian view (counter-cyclicality of R&D) with empirical evidences (pro-cyclicality of R&D). Contrary to Aghion et al. (2005), their results are not due to credit constraints but to the decomposition of the process of innovation into three distinct stages: R&D, commercialization and then implementations which respectively correspond to the creation of new ideas which immediately patented the matching process between those new ideas and the possible concrete applications, and production. Because R&D is seen as a distinct phase from commercialization, the authors show that commercialization activity is concentrated during downturns and R&D activities are more intense during recessions, increasing then the stock of potentially productive knowledge during those periods. The incentive to do R&D during booms is then totally overcome by the hypothesis that there are diminishing returns to existing knowledge. The authors then argue that the model they propose is Schumpeterian and also consistent with empirical evidences that R&D expenses are pro-cyclical, but one can still identify puzzling contradictions. Indeed, on the one side those theoretical results are also consistent with the idea that there exist strategic delays over the cycle which can explain why R&D activities and patenting are not synchronized. R&D should be important during recession and patenting during booms.

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14 Their point is that “new ideas often benefit others beyond the innovators who came up with them. In particular, others might be able to improve on a new idea once it has been introduced, incorporate some of its features, or adopt it full once patents expire.” (p. 1132)

15 Griliches (1990) showed that patents and R&D are highly synchronized during the cycle and Schleifer (1986) suggested that booms are periods of mass implementation of innovations. It may be worth to work on a possible way to reconcile those empirical findings.
b. Creative destruction

The second class of models, which intend to better grasp the concept of creative destruction, adopts a broader definition for technology and considers that it is embodied in capital, skills and organization of work. There are indeed models which examine how a firm (or an industry) characterized by embodied technical progress can manage to adapt to innovations (in products, techniques or organizations). This means that new units must be produced which embody this technological progress and logically a process of continuous creation – destruction is at work.

Caballero and Hammour (1996 and 1994a) are, like Aghion and Saint-Paul, concerned with industry response to cyclical variations in demand. They nevertheless allow more attention to the creative destruction process (and not only to reallocation issues) and then emphasize that

“In general, industries undergoing continuous creative destruction can accommodate variations in demand in two ways: they can vary either the rate at which production units that embody new techniques are created or the rate at which outdated units are destroyed. The central question becomes: along which of these two margins will business cycles be accommodated.” (Caballero and Hammour 1994 b, p.1351)

Caballero and Hammour then provide a real attempt to deal both with reallocation issues (like Aghion and Saint Paul) but in connection with a creative destruction process. “This process of growth through Schumpeterian creative destruction results in an on-going reallocation of factors of production from contracting production sites to expanding ones” (Caballero and Hammour, 1996, p. 805). They then show how disruptive or incomplete contracting in the labor market can affect the creative destruction process and examine the power insiders can execute on jobs destruction and jobs creation incentives. Comparing the respective efficiency of production incentives versus creation subsidies policies, they conclude that creation subsidies are more efficient because they accelerate the pace of reallocation, favoring innovation. On the contrary, production incentives have in the short-run a positive effect reducing unemployment “at a cost of exacerbating [labor market] sclerosis” (ibid, p. 808) They clearly oppose the views generally associated with the so-called ‘liquidationist’ view since they do not consider that a contraction of the economy, due to a cleansing effect, can have a positive effect on the economy. “Our evidence indicates that, on average, recessions depress restructuring” (Caballero 2008, p.3). But if recessions are not
desirable at all, the solution cannot be an intervention which would just aim at compensating their effect.

In the same line of research it is also possible to deal with a process of innovation which consists strictly in adopting new production units but more in replacing outdated ones. This process of creative destruction is associated with the idea of restructuring the production system. Such a phenomenon deserves attention since it accounts for over 50 per cent of productivity growth (Caballero 2008). The intuition is that less productive firms are eliminated during recessions, so that the average productivity increases. Of course, it may be difficult to calculate this effect since it depends both on rates of exit and of entry of new firms. Furthermore, during recessions, the rate of entry of new (supposedly more efficient) firms is lower, so that the impact on productivity may be less than expected, and more than that, the fact that the rate of entry of new efficient firms is lower, limits the extent of the phasing-out of the less-efficient firms. It is also implicit in this literature that since the rise in liquidations during recessions cannot be associated with a contemporaneous rise in the rate of new firms entries, the increased destruction will be followed by a surge in creation during the recovery phase of the cyclical downturn (Caballero 2008). This literature has then produced various papers which investigated the interdependency of entry and exit rates of firms16.

It is also important to notice that this outcome, i.e. the cleansing role of liquidations during recessions, strongly depends on the fact that this model is built on a representative firm-hypothesis and that a ‘single’ firm must create new jobs after having decided their destruction during the previous recession. Of course, a larger variety of outcomes becomes possible as soon as heterogeneity of firms is introduced. This has another consequence: it shows that in order to capture the effect recessions can have on productivity, one must be able to examine the cumulative impact of those investments decisions throughout the complete recession-recovery phase. Moreover, there is no clear distinction in this model between trend and cycles so that it is finally difficult to be sure that the model really captures the global impact recessions can have on growth.

Models as well as empirical evidences, even if they sometimes lead to contradictory conclusions, “coincide in their conclusion that the process of creative destruction is an

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16 See for instance Davis and Haltiwanger (1990).
integral part of economic growth and fluctuations. Obstacles to this process can have severe short- and long-run macroeconomic consequences” (Caballero 2008, p. 5)

We will enter into details in the next section but one can already notice that economic policy conclusions from this sort of models are to some extent provocative: in both cases, stabilization policies are not appropriate since they can be considered as an obstacle to both the reallocation process and the cleansing effect.

c. The scope of the modern contributions

The more recent contributions we have examined in this paper provide (new) arguments and then open again the debate on the need (or not) for economic policy on a new basis. They emphasize as key-elements for growth, the role of innovations, the process of creative destruction and the various positive impacts recessions can have on growth, one can consider that they adopt a Schumpeterian perspective. One can also recognise that, because they provide a different framework for growth, they are able to enlighten a large range of questions and may then address different economic policy recommendations. More precisely, their models can be characterised as follows\textsuperscript{17}:

i) growth results from quality-improving innovations, ii) innovations result from profit-motivated (R&D) investments and finally iii) innovations induce turnover and obsolescence (creative destruction). In order to have the possibility to examine how innovations emerge and foster productivity there are some elements which appear as fundamental ones.

i) This approach has produced an analytical framework which has microeconomic foundations\textsuperscript{18} based on monopolistic competition, a mechanism which allows to analyse the dynamics of profit (increasing with innovation and disappearing with imitation): “they (profits and interest) are both the child and the victim of development” (Schumpeter 1912, p. 322). This literature contributes clearly to the field of firms dynamics, a crucial element for a better understanding of the link between competition and growth.

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\textsuperscript{17} These elements are taken from Aghion and Howitt’s own presentation (2013), they mainly characterise the growth models those authors produced but they are also present in the two categories of models we analyse more specifically in this paper.

\textsuperscript{18} These micro-foundations also open new perspectives since they allow the authors to test the empirical relevance of their models using firm level data.
ii) Through investigations on the notion of the technology frontier in growth models, this approach also meets the theory of development discussing the respective performance of imitation versus innovation development strategies for different sectors or countries. It then opens larger discussions on the role of institutions but also on the shape of economic policy as discussed by Easterly (2005).

Of course, this evolution has produced some debates which question traditional views of economic policy. One can identify a frontier delimitating on the one side the economists who may finally agree on the necessity to implement stabilization policies, on the other side, although they also emphasize the role of innovations for growth and the pro-cyclicality of the R&D activities, economists who will support growth-enhancing economic policies.

4. Elements of continuity versus rupture between those programs of research?

It is relatively easy to acknowledge that the literature we have surveyed investigates questions which were initially identified and analysed by Schumpeter. It is nevertheless quite different (and less easy) to consider them as strictly Schumpeterian i.e. as a natural heir of Schumpeter’s views. We propose then to examine some elements which may explain why those approaches are finally less close than it could have been expected.

Of course, it would be rather naïve to consider that the use of mathematical tools instead of (rhetorical) discourse does not affect the content of the concepts. Then it is rational to consider that the original message of Schumpeter had to be adapted in order to fit with the formalism used. When economists privilege very often the use of mathematics, it is because they are convinced that it is a fundamental step which will allow them to make the concept or variables they are considering more tractable and eventually measurable. It would nevertheless be misleading to consider that such a step can only be considered as strict progress: very often when ideas are put in equations, some aspects of the theory cannot be grasped and only some elements of the theory are then captured and analysed. Here is mainly our point : we believe that though these approaches provide interesting insights and allow to investigate some interactions in detail, for instance between competition and innovations, it is nevertheless difficult to consider that each of these models captures enough in order to be considered as a genuine Schumpeterian model.
a. General considerations

Representative agent versus Heterogeneity of agents. This is a key element of Schumpeter’s approach and certainly something which prevented him to be more precise when he was dealing with economic policy considerations. But it is clear that for Schumpeter, agents’ heterogeneity was absolutely central to his theory. This heterogeneity is founded on the economic sociology of Schumpeter19 “(...) economic analysis deals with the question how people behave at any time and what the economic effects are they produce by so behaving; economic sociology deals with the questions how they came to behave as they do” (Schumpeter 1954, p. 21). This hypothesis is absent from the literature we have examined20.

This has consequences. For instance, introducing firms’ heterogeneity in Aghion and Saint-Paul (1991 or 1998) may have dampened the strength of the reallocation process of resources between sectors and also the productive character of recessions. In the same perspective, when Caballero and Hammour analyze the respective rates of creation and destruction of jobs, there is no guarantee that the cleansing effect is anymore at work: if firms’ heterogeneity is introduced, firms which have destroyed jobs are of different nature than the ones which created jobs.

Information and expectations. Schumpeter always insisted on the fact that agents’ rationality is rooted in economic sociology, which is also the case for the entrepreneur21. Then the hypothesis of rational expectations as well as perfectly informed agents does not seem to be fully compatible with Schumpeter’s views. It is indeed difficult to imagine a Schumpeterian analysis of economic change within an analytical framework based on intertemporal equilibrium with rational expectations. Indeed, Schumpeter, for instance, strongly emphasized that the reallocation process between production and innovative sector is at the origin of a distortion in the production process, a disequilibrium which may create inflation since, banks and credit creation, are the precondition (creating purchasing power) for the additional resources that the pioneering entrepreneur needs in order to finance innovative activities without diverting ‘too many’ resources from the production process.

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19 See Festre and Garrouste (2008) for a deeper analysis of rationality, behavior and economic change in Schumpeter.

20 Only evolutionary approaches (with a large definition, i.e. including for instance agents-based models) adopt this hypothesis in Schumpeterian models.

b. The role of recessions: reallocation and cleansing effects.

The type of recessions analysed by Aghion and Saint-Paul are temporary recessions. More than that, they do not take into account the fact that, the more recessions are productive, *i.e.* the more the reallocation process is at work, the more those recessions may become shorter. Then those recessions are not general gluts which may affect the optimism of agents (and of entrepreneurs) but rather short and regular fluctuations of the activity level. So a very restrictive view of what recessions could be.

More than that, this literature finally does not analyse all the phases of the cycles, but only concentrates its attention to the investment decisions during recession, deducting the impact on growth dynamics but without modelling it explicitly. In the same line, this approach only focuses on ‘productivity’ but the implementation of new processes of production may not lead immediately to higher productivity but there are other innovations which, for instance, lead to an increase in variety of goods which is less easy to capture but may also affect the investment decision the entrepreneur is facing in an OC model.

This is also the case in the model analysing the cleansing effect of recessions; to some extent, they want to understand why reallocation during recessions may fail to select the most efficient production arrangements. These models have the merit to better emphasise, compared to IC models, the disruptive effects of creative destruction introducing some degree of specificity of investments, for instance with respect to labor\(^\text{22}\). The selection process they provide is interesting since it describes economies as dynamic structures, continuously involved in restructuring, and as it is suggested by Schumpeter, this dynamics is the outcome of inner frictions which are due to the reallocation process over the cycle. Nevertheless the lack of heterogeneity, especially when the focus is on firms’ dynamics, cannot fully capture the Schumpeterian conception of firms’ dynamics.

Finally, as we already have emphasized, productive recessions are analysed as a separate issue from creative destruction. Indeed the OC models used for the first question do not deal with creative destruction, only with the decision to allocate resources between the two sectors (production *versus* R&D sector). Such a reallocation process is not really a major issue since choices are reversible and not really costly (not important financial costs and no losses in productivity which may have affected the

\(^{22}\text{This sort of hypothesis is totally absent from the Aghion and Saint-Paul papers, even more from Saint-Paul (1994) although this paper specifically deals with the labor reallocation process over the cycle.}\)
allocation decision). In other words, ‘this’ reallocation is painless and does not generate the disequilibrium creative destruction should be associated to.

c. The conception of economic policy

In 1931 Schumpeter was still convinced that the severity of the depression resulted from the coincidence of the through phase of all three types of cycles: The Kondratieff long wave, the Juglar and the Kitchin.\(^{23}\) “[D]epressions of such severity have repeatedly occurred – roughly once in fifty-five years” (Schumpeter 1942, p. 64). From the beginning Schumpeter had emphasized the wave-like movement of capitalist development being characterized by the succession of prosperity and depression.\(^{24}\) “There was nothing unprecedented in this breakdown in 1929-1932 … the intensity of the depression will be in some way proportional to the intensity of the preceding progress”, Schumpeter ([1941] 1991, p. 351) still argues in his Lectures given at the Lowell Institute in Boston in March 1941. Whereas the recession is a physiological process leading towards equilibrium, which Schumpeter considered as “the normal working of the evolutionary mechanism”, “the excesses of speculation and loose banking methods make the thing much worse than it otherwise would be” (Ibid, p. 350). These are at the root of the pathological processes in an overshooting boom which cause the depression, leading the economy far away from an equilibrium position. However, in the whole decade after the outbreak of the Great Depression Schumpeter was never afraid of becoming unpopular and kept on emphasizing “that in the breakdown there was promise of a harvest” (Ibid, p. 351). Time and again he pointed out the functionality of the crisis consisting of a spring cleaning, i.e. the precondition of a new recovery.

Also in this case of the beneficial role of depressions Schumpeter advocated his position in his normal controversial style which gave his students at Harvard the impression, later noted by Robert Heilbroner (1980, p. 311) in his *Worldly Philosophers*:

But the students who attended his classes in the late 1930’s were regularly shocked to hear this expositor of capitalist growth declare, with obvious enjoyment, that depressions, far from being unmitigated social evils, were actually in the nature of “a good cold douche” for the economic system!

With regard to economic policy, Schumpeter takes a clear anti-interventionist stance, in its consequences siding more with his Austrian compatriots Hayek and Mises, in contradiction to Keynesians or New Dealers. Schumpeter, however, elaborates his

\(^{23}\) See, e.g., Schumpeter (1931a) in Clemence (1951, pp. 96-97).

\(^{24}\) See also Hagemann (2003).
economic policy conclusions on the basis of his theory of economic development/evolution in which the recuperative powers of the capitalist system play a decisive role:

[D]epressions are not simply evils, which we might attempt to suppress, but – perhaps undesirable – forms of something which has to be done, namely, adjustment to previous economic change. Most of what would be effective in remedying a depression would be equally effective in preventing this adjustment (Schumpeter [1934] 1989, p. 115).

Any artificial stimuli, made with the best moral intentions, to remedy the crisis, finally would make things worse because it would interfere into the work of depressions to correct maladjustments, and instead create new maladjustments of their own. According to Schumpeter, not only in the cases of the 1825 and 1873 depressions but also in all other depressions “recovery came of itself” (Ibid, p. 117).

Whereas Schumpeter repeatedly pointed out this quasi-automatic return to an equilibrium position, this does not hold for the prosperity phase as a movement away from equilibrium which requires the stimulus of new innovations. Schumpeter does not give a real explanation of the lower turning point of the cycle but relies upon the recuperative powers of capitalism and trusts in the ‘natural recovery’ (Schumpeter 1939, p. 995). On the other hand, a modern neo-Schumpeterian such as Gerhard Mensch, who in his Stalemate in Technology invented the term basic innovations for major technological breakthroughs, indicates in the subtitle of his successful book that only Innovations overcome the Depression (Mensch [1975] 1979).

According to Schumpeter a functioning capitalism does not need any stabilization policy. It would be better to follow a prophylactical policy to avoid severe crises by adhering to clear rules such as the gold standard, a reasonable wage policy, etc., rather than to intervene and make things worse. Whereas Schumpeter shares Keynes’s position that in the depression only an expansive fiscal policy but not an expansive monetary policy would be an efficient remedy, he seriously deviates from Keynes when he favors “the ruthless principle that the budget ought to be balanced under any circumstances” (Schumpeter 1941, p. 371). While conceding that “[a]ction on that principle makes

25 For a detailed analysis of Schumpeter’s theoretical diagnosis of the Great Depression and his views on the appropriate economic policy see also Klausinger (1993).
things worse in a depression” (Ibid), it might nevertheless be healthier in the long run because a too long dosis of a budget deficit as a stimulant can make a country dependent on this kind of drug like a “morphinist”.

The modern literature seems to offer a large variety of models but it is not clear that these models lead to the same variety in terms of economic policy.

It has been shown, for instance, that the fact that job destruction is much more responsive than job creation to the business cycle leads to the view that “recessions are a time of "cleansing" when outdated or unprofitable techniques and products are pruned away of the productive system. A related, but distinct idea is the "pit-stop" view of recessions, according to which recessions are times when productivity-improving activities are undertaken because of their temporarily low opportunity costs (see e.g., Davis and Haltiwanger 1990; Aghion and Saint-Paul 1991; Jordi Gali and Hammour,1991; Robert Hall 1991)” (Caballero and Hammour 1994b, p. 1365).

This sentence expresses what we have already underlined: the cleansing effect of recessions on the one hand, and productive recessions on the other, are not similar concepts. The question then comes up whether they may also lead to different conclusions in terms of economic policy.

We also have to distinguish between different approaches of the same mechanism. For instance, some authors like Hammour and Caballero (1994 b) specify that they are only addressing the positive side of the question, i.e. that recessions are times of clean(s)ing, while others focus on the normative side - which considers recessions as “desirable” events. So before drawing economic policies from the models, the perspective of each paper has to be clearly understood. One can identify some general features for economic policy.

First of all, cleansing effect–based models lead to consider any obstacle to that cleansing effect as counterproductive (Caballero and Hammour 1996, p .806) : “This paper aims at improving our understanding of the characteristics of an efficiently functioning creative destruction proved, of the way malfunctioning markets can disrupt this process, and of appropriate policy responses to such disruptions. “ So, the objective of economic policy far from preventing recessions is to be sure that no obstacle will prevent the full implementation of the cleansing effect. They also emphasize that a pure
counter-cyclical policy may not be useful. Indeed, if counterbalancing the negative impact on employment in the short-run can be seen as an efficient economic policy, it can appear that such a policy, *in fine* creates a distortion with a long-run negative impact on employment (cf. former explanation provided by Caballero and Hammour (1996)).

Then, without explicitly saying that recessions are desirable events, the OC approach nevertheless considers that one can really identify clearly “virtues of bad times”. One can notice here a change in the way economists conceive recessions. Here, the positive impact of recessions is emphasized while Schumpeter only mentions the capacity of the system to react in recessions/depressions, *i.e.* the ‘recuperative powers of capitalism’. Now, recessions are more than just an economic context stimulating various cleansing effects and magnifying great entrepreneurs. They are conditions for a higher stimulation of R&D investment. To say it another way, because those models are based on a learning or doing mechanism, fluctuations can only have a positive impact on growth (while under a learning by doing mechanism, instability can only have a negative impact on growth).

All those discussions open a larger question: the one of the link between instability and growth. Concentrating on innovations as the main source of growth, this modern literature insists on the necessity for an economy to be “flexible”, in order to proceed to factors reallocation but also to creative destruction process. Then a relative instability is totally necessary at the microeconomic level in order to guarantee the regular and frequent emergence of innovations, the only way to have a sustained growth rate. So a sort of micro-instability is necessary to guarantee macro-stability (regular growth). Of course, this scenario strongly depends on the capacity of such a system to proceed to “smooth reallocations”, *i.e.* reallocations which are sufficiently symmetric (between for example, jobs destruction and jobs creation) in order to guarantee a relatively high level of employment.

Finally, there is a more general objection that literature has to face: there is no clear empirical support for the view that recessions are times of cleansing. Indeed, this view implies counter-cyclical productivity growth, while the great majority of empirical investigations find that average labor productivity varies pro-cyclical as well as R&D activities. Without doubt a deeper empirical investigation into the cleansing effect is
needed. It means that we have to identify what is the dynamic response of productivity growth to business cycles. This better “evidence” has been strongly debated and papers quickly converged in concentrating their efforts on the empirical side. Opposing mainly learning by doing versus learning of doing models, the debate ceased in the early 2000s without any possibility to finally prove which on the two effects was the dominant one. Since the recent revival of this literature, despite some new elements does not seem to provide any definitive answer to this important question, one can easily imagine that sharp economic conclusions cannot be drawn from these models.

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27 Cf. Collard (1994) for a survey of the theoretical literature of the two categories of models (lbd and lod).
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