CHAPTER 7
Instability under Capitalism

The theoretical models presented in the preceding five chapters identify the various sources of instability within the neoclassical framework when savings are optimally determined by utility-maximising households. And in so far as the neoclassical framework explains, or seeks to explain, the functioning of a laissez-faire capitalist economy, our theoretical formulations underscore the unstable tendencies of laissez-faire capitalism. Whether the laissez-faire capitalism, as envisaged by the propounders of neoclassical theory with its underlying assumptions of perfect competition and atomistic price-taking agents, is a meaningful representation of the existing capitalist world (even where state control is minimal) is a contentious issue. This question, though perfectly legitimate on grounds of realism, however does not concern us here. The point is, even if we accept all the neoclassical assumptions from a purely logical point of view (not necessarily realistic), the structure is not as stable as the neoclassical school would like to believe.

That laissez-faire capitalism is inherently unstable is not a new idea. Indeed analyses of various disintegrating and contradictory forces at work under capitalism constitute the theoretical foundation of Marx’s general social theory. More recently, the so-called Keynesian revolution again brought this issue to the fore. Though there are many alternative theories about the inherent instability of the capitalist system, two of them are widely recognised in the existing literature. These are (a) instability arising due to class conflict, as emphasized by Marx; and (b) instability arising from effective demand problem, as elaborated by Keynes.¹ (In fact the later day Marxist and Keynesian economists treat either or both of these factors as an integral part of the capitalist system and many of them seek to explain the observed stability of the system in reality in terms of some other factors. See for example Goodwin (1967), Cornwall (1972), Rowthorn (1977), Skott (1989), Patnaik (1997)). In what sense

¹ The effective demand problem also figures in Marx as a source of capitalist crisis. But he seems to identify class conflict as the basic source of instability under capitalism.
then is our result different from the rest? Our analysis is different from the existing Marxist and Keynesian literature on instability in at least one important aspect: we operate in a purely neoclassical framework; instability in our models arises neither from the Marxian class conflict, nor due to the Keynesian effective demand problem. But before we go into a detailed analysis of the nature of instability in our framework, it seems pertinent to briefly look at the other alternative theories of instability under capitalism. This is what we propose to do in the next section of this chapter (section II). Section III analyses the nature and source(s) of instability within the neoclassical framework, as reflected in our models. In section IV, we examine the possible upper and lower bounds on the economy (if any) which may restrict its movement away from equilibrium.

II. Alternative Theories of Instability of Capitalism:

Instability as appears in the writings of the Classicists:

That capitalism will gradually run out of steam due to a falling rate of profit and will ultimately lapse into a stationary state is an idea that appears recurrently in the writings of the classical economists. As Dobb says, "the notion of the stationary state ... in slightly different guises and varying degrees of emphasis occupied a place in much of the writings of the classical period. Were one painting the scene in dramatic colours, one might be tempted to speak of this as a nightmarish phantom lurking just over the horizon; its possible emergence being a constant preoccupation whenever the long-term effects of policy measures were considered."\(^2\) We first discuss the nature and causes of stationary state, as reflected in the writings of the three prominent economists of the classical school, namely Adam Smith, David Ricardo and John Stuart Mill. Then we move on to Marx's theory of capitalist instability.

\(^2\) Dobb (1973), pp. 87.
Smith, Ricardo and Mill:

In Smith, a falling rate of profit is caused by the competition among capitalists: “when the stocks of many rich merchants are turned into the same trade, their mutual competition naturally tends to lower profit; and when there is a like increase of stock in all the different trades carried out on the same society, the same competition must produce the same effect in them all.” Smith (1776), in Cannan (ed), 1904 edition, pp. 98.

3 The Smithian view of progress of capitalism runs along the following lines. Smith draws a distinction between ‘productive’ labour and ‘unproductive’ labour. Any act of saving contributes to the process of accumulation by shifting labours from ‘unproductive’ to ‘productive’ uses. The basic motive for savings is profit. A higher income, in so far as it leads to higher savings and therefore higher accumulation, results in higher growth through three separate channels: (a) through increased labour productivity by equipping labour to perform increasingly specified functions (division of labour); (b) through the enlargement of the market by itself; and (c) through increase in the wage rate above subsistence that induces population increase, which in turn increases the effective demand and the scale of the market and at the same time generates the labour necessary to supply the needs of the expanded market. Thus there is a cumulative causation which is set in motion by the initial act of accumulation. However this process cannot go on forever. As capital accumulates, rate of profit falls due to competition among capitalists; hence the inducement for accumulation declines and the economy approaches its ‘full complement of riches’. Smith (1776), in Cannan (ed), 1904 edition, pp. 98.

There is a logical fallacy here in Smith’s argument about falling rate of profit. Smith confuses between a micro and a macro phenomenon. While increased competition among capitalists may lead to a fall in the profit rate in a particular industry at the micro level, it is not clear how this can lead to an overall decline in the rate of profit for the entire economy. See Dobb (1973), pp. 52.

4 In the stationary state, wage rate remains at the subsistence level; profit rate falls back to its normal level; there is no incentive to invest; the economy stagnates.

Ricardo shared with Smith a similar vision about the ultimate stagnation of capitalism due to falling rate of profit. However, unlike Smith, it is not the forces of competition operating through the laws of demand and supply that pushes the profit
rate downward. In Ricardo this crucial role is played by the law of diminishing returns in agriculture. According to Ricardo, the long run profit rate throughout the economy is set by the profits on agriculture. The long run wage rate, on the other hand, is given by the amount 'necessary to enable the labourers to subsist and perpetuate their race without either increase or diminution', which Ricardo calls the natural price of labour. (While the market price of labour may deviate from its natural price in the short run, in the long run it conforms to the natural price through an adjustment in the population growth rate). In Ricardo, supply of land is the binding constraint. With progress of the economy, increasingly inferior qualities of land are brought under cultivation, which increases the price of food, and at the same time enables the landlords to appropriate a higher and higher proportion of the surplus as rents. This two factors drive the rate of profit to zero. "With every increased difficulty of producing additional supplies of raw materials from the land, wages would rise. A real rise of wages is necessarily followed by a real fall of profits, and, therefore, when the land of a country is brought to the highest state of cultivation, when more labour upon it will not yield in return more food than what is necessary to support the labour so employed, that country is come to the limit of its increase both of capital and population." 5

According to John Stuart Mill, savings and accumulation are not determined by the rate of profit but by the 'desire to accumulate', which in turn depends upon various 'intellectual and moral causes' like 'providence' etc. Thus savings is now 'an act of deliberate choice by the households'. 6 Since savings no longer depend on the rate of profit in the economy, there is a separation in Mill between distribution and accumulation. According to Mill, there are three basic phenomena responsible for expanding productivity in a capitalist society - advancement in knowledge, in 'security' and in 'cooperation'. 7 The growth of the economy is nonetheless

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7 Mill does not explain how these factors actually operate in a capitalist economy to bring 'progress in wealth'. Hollander writes: "Mill made no concerted effort to analyse the causes of observed advance in knowledge, security and cooperation. That such a phenomenon is at play was taken for granted as an empirical tendency characterising modern 'progressive' society, the rationale for which ... is left unsaid." (Hollander (1985); Vol. I, pp. 190).
constrained by diminishing returns in agriculture. Using a line of argument similar to Ricardo, Mill writes, "Agricultural skill and knowledge are of slow growth and still slower diffusion. Invention and discoveries too occur only occasionally, while the increase of population and capital are continuous agencies. It therefore seldom happens that improvement, even during a short time, has so much the start of population and capital as actually to lower rent, or raise the rate of profits. There are many countries in which the growth of population and capital is not rapid, but in these agricultural improvement is less active still. Population almost everywhere treads close on the heels of agricultural improvement, and effaces as fast as they are produced. The reason why agricultural improvement seldom lowers rent is that it seldom cheapens food, but only prevents it from growing dearer; and seldom, if ever, throws land out of cultivation, but only enables worse and worse land to be taken in for the supply of an increasing demand."\(^8\)

Note that in Smith, the ultimate transition of a capitalist economy from a 'progressive' state to a stationary state is brought about by competition among capitalists; therefore there is no scope here for a judicious government policy which might have a counteracting influence on the process. In contrast, the stationary state of both Ricardo and Mill results from diminishing returns in agriculture. In Ricardo, the transition to a stationary state can be almost indefinitely postponed by improving technology and importing food grains. Mill, on the other hand, identified population growth as the chief source of evil and therefore saw a solution in population control, if necessary through state legislation. In Mill, the state can play an active role in checking the rate of growth of population control by eradicating poverty and ignorance (the two major causes of population growth) through measures like public education, land reforms etc. If in fact population is also stationary, and hence it is the supply of labour which is the binding constraint, then the stationary state in Mill becomes something desirable (from the workers' point of view at least). As Hicks pointed out, "if population can once be controlled, there is no need for the economy to go on expanding, in order that wages should be above the subsistence level. Instead of land being the main fixed factor, so that (as in the Ricardian stationary

state) surplus production is swallowed up in rent, it is labour that becomes the main fixed factor, so the surplus production can be made to go, at least in large measure, to wages. This is an altogether different, and much more agreeable, picture. The stationary state is no longer a horror. It becomes an objective at which to aim."\(^9\)

The important point to be noted here is that both in Ricardo and Mill, though *laissez-faire* capitalism may entail gradual stagnation, state as an outside agency may play a key role in counteracting such destabilizing tendencies.

Despite their concern about the condition of the poor at the stationary state, neither Smith nor Ricardo really considered the possibility of emergence of a new social order once the capitalist economy reaches this state. At the stationary state of Smith and Ricardo, both the workers and the capitalists are worse off, the former surviving only on subsistence wage, while the latter earning just the normal rate of profit or zero profit (as in Ricardo). But there is no allusion to any kind of social tension arising out of this. Mill's stationary state on the other hand changes its character entirely through direct government intervention. It represents some kind of a social optimum which is arrived at, not through any process of social evolution where the agents themselves take an active role, but through the reformist policies (e.g. redistribution of income, land reform, education etc.) of a paternalistic state which works from outside to improve the living conditions of the poor.\(^10\)

*Marx:*

Analyses of the inherently contradictory forces at work under capitalism forms the very basis of Marxian economic theory. According to Sweezy, "Marx's entire theoretical system constitutes a denial of the possibility of indefinite capitalist expansion and an affirmation of the inevitability of the socialist revolution."\(^11\)

Marx views capitalism as a social order where the society is divided between two antagonistic classes – the capitalists and the workers. And unlike the other classical economists, in Marx, state is not an exogenous entity; it is an integral part of the capitalist social order and represents 'an economic power'. State power, in

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\(^9\) Hicks (1983), pp. 68.
Sweezy's opinion, performs three functions in a capitalist set up: "in the first place, the state comes into action in the economic sphere in order to solve problems which are posed by the development of capitalism. In the second place, where the interests of the capitalist class are concerned, there is a strong predisposition to use state power freely. And, finally, the state may be used to make concessions to the working class provided that the consequences of not doing so are sufficiently dangerous to the stability and functioning of the system as a whole."\(^{12}\) Therefore in the Marxian doctrine the state can play no independent role to counterbalance the destabilizing forces operating under capitalism if such a role impinges adversely on the interests of the capitalists.

Marx's theory of working of a capitalist economy is not a single unified theory. There are various strands of arguments scattered over a number of different writings, each representing "a particular ‘window’ or vantage point from which to view an extraordinary complex process."\(^{13}\) The various sources of instability in Marx can be categorised, at the risk of oversimplification, under four broad heads: (i) falling rate of profit; (ii) economic crises leading to disruption of the production process; (iii) centralization of capital; and (iv) class conflict. The first three factors are purely economic in nature; the last one is a socio-politico-economic factor which encompasses and is implied in all the other factors. The three economic factors are also not independent of one another. All these forces work in a complex interrelated manner to generate a dynamic motion within the capitalist system that leads to an overthrow of the system and emergence of a new social order in the form of socialism.

The very basic contradictory force at work under capitalism is class conflict. The other sources of instability in the end manifest themselves in the form of class conflict. In Marx it is class struggle which is responsible for the ultimate demise of capitalism. Thus the reason behind the collapse of capitalism is chiefly political, not economic. However the economic factors contribute to the overall process by

\(^{12}\) *Ibid*, pp. 249.

\(^{13}\) *Harvey* (1982), pp. 156.
enhancing the already existing class antagonism. To see how, let us examine these economic factors more closely.

The first two factors, namely falling rate of profit and economic crises, are interrelated phenomena - the causality running both ways. In the Marxian schema, with the advancement of capitalism the rate of profit falls due to three different reasons. By definition, the rate of profit is positively related to the rate of exploitation and negatively related to the organic composition of capital. 14 The rate of exploitation is determined by the existing social conditions; more specifically, it depends on the relative strength of the working class vis-à-vis the capitalist class. With economic expansion, the reserve army of labour is gradually used up, which strengthens the bargaining power of the workers. Therefore, the wage rate rises or the working hours get reduced or both. In either case, the rate of exploitation falls resulting in a fall in the rate of profit. Secondly, with the progress of the economy, due to greater and greater investment the organic composition of capital rises. Therefore even with a constant rate of exploitation, rate of profit falls. There is a third channel through which the rate of profit may fall. As the profitability of investment starts declining due to the above mentioned reasons, if the capitalists react by trying to raise the rate of exploitation, then it immediately contributes to the class conflict and related social tensions. On the other hand, if the capitalists react by reducing the level of investment, then there is overproduction (due to lack of demand - in a Keynesian fashion) and hence crises. But at the same time the very fact that there is a crisis implies that the capitalists cannot sell their entire produce and therefore cannot realize their entire profit. So with the advent of crises, the actual or realised rate of profit falls. Thus the causality runs both ways. However this third channel becomes operative only when the economy is already in a crisis.

Likewise, there are at least three sources of crises identifiable in Marx's writings: (i) crises generated by a falling rate of profit, (ii) crises generated by under-consumption, and (iii) crises generated by disproportionality in the production

14 In Marx, total value of a commodity = c + v + s, where v is the variable capital (value of labour-power), c is the constant capital (value of other means of production) and s is the surplus value. Marx defines rate of exploitation $s' = s/v$, organic composition of capital $q = c/(c+v)$, and rate of profit $p = s'(1 - q)$. Therefore it follows that $p = s'(1 - q)$. 
process. How a falling rate of profit may entail crises in a capitalist framework has been discussed in the preceding paragraph. While a falling rate of profit leads to crises through a reduction in investment, there is separate channel whereby crisis is ushered in through insufficient consumption demand. This is the under-consumptionist argument. The argument runs as follows. Suppose with the expansion of the economy the capitalists are successful in keeping the wage rate relatively low either by using labour-saving technology or by directly increasing the rate of exploitation (for example, by imposing longer working hours for the same wage rate). Then there will be a fall in the share of wages and a rise in the share of profits. But in so far as the workers consume their entire wage income while only a part of the capitalists’ profit is consumed, the consumption demand will grow at a rate which is less than the rate of growth of capacity in the consumption good sector. Since the ultimate purpose of accumulation is to produce goods for consumption, sooner or later there will be large unutilized capacity in the consumption good sector which will restrain the capitalists from accumulating further. Thus there will be a fall in aggregate demand and crises would set in.

15 See Sweezy (1942) for a detailed analysis of the sources of crises in Marx.
16 Clearly the assumption here is that the capitalists do not necessarily invest the entire unconsumed part of their surplus. Apart from the rate of profit, expectations about future demand vis-à-vis capacity also enter into the capitalists’ investment function. If we assume that profit is the sole determinant of investment, and that as long as the profit rate lies above a certain value, capitalists invest their entire surplus over consumption (which amounts to accumulation for accumulation’s sake), then even if consumption demand falls due to a fall in wage share, this fall will be exactly balanced by a rise in the capitalists’ investment demand; so there cannot be any aggregate demand problem. Savings are always equal to investment in this case, which precludes any crisis. In a passage in Capital (Vol. I), Marx seems to suggest precisely this:
“So far as he (the capitalist) is personified capital, it is not values in use and the enjoyment of them, but exchange value and its augmentation, that spur him into action. Fanatically bent on making value expand itself, he ruthlessly forces the human race to produce for production’s sake. ….Moreover, the development of capitalist production makes it constantly necessary to keep increasing the amount of capital laid out in a given industrial undertaking, and competition …compels him to keep constantly extending his capital, in order to preserve it.” (Marx (1954), pp. 555)
How does one reconcile this with his argument elsewhere (for example in the section on internal contradictions of the law (of falling profit rate) in Capital, Vol. III) on how the ‘consumer power based on antagonistic conditions of distribution’ restricts the capitalists’ tendency to expand the productive capacity – an argument with obvious under-consumptionist implications? One way to reconcile the two strands of argument is to draw a distinction between accumulation and investment. Accumulation in this sense is synonymous to savings (in money form) which do not necessarily imply an act of investment in the form of an increase in the actual productive capacity. For an elaboration of this point see Pataiak (1997), pp. 22-23.
The third cause of capitalist crises in Marx arises from disproportionality in production. This problem is closely associated with the problem of incomplete information and co-ordination failure. In an actual capitalist market, there is no 'auctioneer' carrying out hypothetical demand and supply exercises with respect to prices and in the process arriving at the equilibrium price and quantity configuration in each market and in every period. The economy functions by methods of trial and error. Since it is not possible for the capitalists to know beforehand the exact level of demand in each and every sector in any period, there is likely to be overproduction (relative to demand) in some sectors and underproduction in some others. If these discrepancies in demand and supply manifest themselves in terms of movements in relative prices, then one would expect that over time these discrepancies will be smoothed out with production increasing in the sectors where prices have gone up, and decreasing in sectors where prices have gone down. This is not an instantaneous process however and therefore in so far as the general social conditions affecting demand and supply are continuously changing (due to population growth, technical progress etc.), the problem may perpetuate, affecting other sectors and ultimately resulting in a general crisis.

There is a controversy about the role of these economic crises in Marx in bringing down the capitalist social order. No doubt Marx believed that these crises would become increasingly more frequent and intense with the progress of the capitalist economy and "by their periodical return (would) put on its trial, each time more threateningly, the existence of the entire bourgeois society". But it is not clear whether he implied that the crises would lead to an economic breakdown of the system. According to Sweezy, "nowhere in his work is to be found a doctrine of the specifically economic breakdown of the capitalist production." But even if these crises do not on their own result in a breakdown of the system, it is easy to see how they enhance the class antagonism within the capitalist society with the worsening of workers' condition due to massive unemployment concomitant of crises.

17 Marxian economists identify this problem with the inherent 'anarchy' of the capitalist system.
19 Sweezy (1942), pp. 192.
We now come to the final source of instability in Marx, concentration of monopoly power in the hands of a few capitalists, which Marx called the 'centralization of power'. Marx identified a historical tendency under capitalism towards increasing centralization of capital. This tendency is a result of the presence of large economies of scale. Emergence of advanced credit system and corporations also contribute to the process. The net fall out of this is that there is more inequality in the system leading to social unrest – the basic cause of capitalist downfall. “Along with the constantly diminishing number of the magnates of capital, who usurp and monopolise all advantages of this process of transformation, grows the mass of misery, oppression, slavery, degradation, exploitation; but with this too grows the revolt of the working-class, a class always increasing in numbers, and disciplined, united, organised by the very mechanism of the process of capitalist production itself. The monopoly of capital becomes a fetter upon the mode of production, which has sprung up and flourished along with, and under it. Centralisation of the means of production and the socialisation of labour at last reach a point where they become incompatible with their capitalist integument. This integument is burst asunder. The knell of capitalist private property sounds. The expropriators are expropriated.”

Instability in the writings of later day economists:

Among the economists of the 20th century, the two most important contributors on the instability theory are Joseph Schumpeter and John Maynard Keynes.

Schumpeter:

One finds astonishing similarity between Marx’s prediction about the future of capitalism and Schumpeter’s view that “there is inherent in the capitalist system a tendency towards self-destruction .... – those factors make not only for the destruction of the capitalists but for the emergence of a socialist civilization.”

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21 Schumpeter (1943), pp. 162.
Schumpeter’s theory of capitalist development has evident affinities with some of Marx’s ideas; but he differs significantly from Marx in his identification of the source of this self-destructive tendency.

In his *Economic Journal* article on instability of capitalism, Schumpeter distinguishes between instability of the capitalist ‘system’ and instability of the capitalist ‘order’. While the issue of stability of the capitalist ‘order’ addresses itself to the “institutional survival of capitalism”, capitalist ‘system’ refers to the functioning of the capitalist production process as reflected in the dynamic behaviour of various economic variables like output, employment, income, profit. Instability of the capitalist ‘system’ does not necessarily imply instability of the ‘order’. Schumpeter also differentiates between two phases of capitalist development: the first phase is that of ‘competitive’ capitalism, which is followed by a phase of ‘trustified’ capitalism. Under ‘competitive’ capitalism, the production process is characterised by the individual initiative of a number of small competitive producers. ‘Trustified’ capitalism on the other hand characterises the phase when the production process is dominated by large impersonal business firms. According to Schumpeter, in the initial phase of ‘competitive’ capitalism, though there exist instabilities in the capitalist ‘system’ in the form of fluctuations in the economic variables, there is no instability of the capitalist ‘order’ – economic or otherwise. It is only at a later stage, when capitalism becomes ‘trustified’, that instability of the capitalist ‘order’ manifests itself. But even in this phase, Schumpeter finds no *economic* reason for the instability. The eventual decay of capitalism and the consequential transition to socialism, according to Schumpeter, follows from the various socio-political forces that are generated by the very process of capitalist development. Let us now examine these destabilizing forces more closely.

In the Schumpeterian vision of economic development, ‘innovations’ and ‘entrepreneurs’ have important role to play. In the early phase of ‘competitive’ capitalism, innovations act as the engine of growth, and it is the entrepreneurs who are instrumental in activating this engine. The process of development in Schumpeter can be generated by five different classes of events: (i) introduction of

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22 Schumpeter (1928).
new commodities; (ii) introduction of new methods of production; (iii) opening up
of new markets; (iv) conquest of new sources of raw materials; and (v) new
organisation of any industry. All these events are results of ‘innovations’ and the
agent who introduces these innovations is the ‘entrepreneur’. Schumpeter’s
entrepreneurs are different from the ordinary capitalists. They are the captains of
industry, business leader who are not guided solely by profit motives: “first of all,
there is a dream and the will to found a kingdom, usually ... also a dynasty... Then
there is the will to conquer; the impulse to fight, to prove oneself superior to others,
to succeed for the sake, not of the fruits of success, but of success itself... Finally,
there is the joy of creating, or getting things done, or simply of exercising one’s
energy and ingenuity.”  

The innovations carried out by the entrepreneurs by means of borrowed
money initiates a process of economic growth. The entrepreneurs’ profit at the
initial stage motivates others to follow suit; investment increases – leading to an
overall rise in the level of economic activity. Where is the instability then? The
instability within the capitalist ‘system’ follows from the fact that the innovations
appear in clusters. Clustering of innovations creates a discontinuous disturbance in
the economy resulting in a boom. However, the entrepreneurs’ ‘race for means of
production’ bid up the factor prices while appearance of new products in the market
causes a fall in the commodity prices. The relationship between product prices and
commodity prices render further innovation unprofitable; loses occur; depression
sets in. Ultimately the ‘system’ settles to a new equilibrium through a process of
liquidation and/or transformation of old firms with new firms acquiring important
positions in the business hierarchy, and a general adaptation of the new
product/process/raw material in the economy as a whole. This new equilibrium is
characterised by a higher level of per capita output and therefore, by a general
improvement in the standard of living of the lower income group.

23 Schumpeter (1949), pp. 93.
24 In Schumpeter, during the period of ‘prosperity’, there is a fall in consumption as the innovators
bid away the factors of production. Hence the standard of living of the lower income group falls
during a period of ‘prosperity’ and rises during ‘recession’. This peculiar pattern of the
Schumpeterian business cycles has been subject to criticism. See Lange (1941).
capitalist process, not by coincidence but by virtue of its mechanism, progressively raises the life of the masses.”25 Hence during the ‘competitive’ phase of capitalism, though the ‘system’ may be unstable in the sense that there are fluctuations in some of the economic variables, this instability does not endanger the stability of the capitalist ‘order’ as a whole.

Problem of instability in the capitalist ‘order’ appears in the period of ‘trustified’ capitalism, but entirely through non-economic channels. There are five socio-political factors which account for this instability. Firstly, ‘trustified’ capitalism leads to “obsolescence of the entrepreneurial function.” During this later stage, technical progress, by uncovering the possibilities of economies of scale, inevitably results in emergence of “big business.” With the growth of large firms and corporations, “economic progress tends to become depersonalised and automatized.” At the same time, the very success of the entrepreneurs in innovating creates a social environment where economic changes are accepted as a matter of course. Innovations therefore become a routine process, with less resistance needing to be overcome by entrepreneurial energy and will power. Thus individual entrepreneurial leadership is replaced by a bureaucracy of trained managers. The decline of entrepreneurs affects the entire bourgeoisie class – a class whose income, status and function were crucially dependent on successful innovation. The bourgeoisie increasingly loses its will and capacity to defend capitalism.

Secondly, according to Schumpeter, the bourgeoisie is politically weak and therefore requires protection from some other agency within the society. Historically pre-capitalist social institutions like monarchy provided the bourgeoisie class such support. But capitalist rationality and liberalism led to the “destruction of the protective strata” and in doing so, removed one of the buttresses that until then prevented its political collapse.

Thirdly, the growth of large corporations, which substitute salaried executives and managers for entrepreneurs and stock holders for owners, tend to undermine property interest. “Thus capitalist process pushes into the background all

25 Schumpeter (1943), pp. 68.
those institutions, the institutions of property and free contracting in particular, that expressed the needs and ways of truly ‘private’ economic activity.”

Fourthly, capitalist rationalism also leads to a disintegration of the bourgeois family, encouraging the application of “utilitarian calculus” to the problem of optimal family size. The resulting decline in family size and the weakening of family values encourage the acceptance of “anti-saving theories” and “short-run philosophy” and diminish the drive to accumulate.

Finally, capitalism, “by the very logic of its civilization”, produces a social group – intellectuals – who are endowed with leisure, freedom of speech and attitudes of rational scientific inquiry. This intellectual class stimulates and organises the materials of social discontent that results in a growing hostility towards the capitalist ‘order’. In the face of this growing antagonism and criticism, public policy also becomes more and more hostile to capitalists’ interests and the capitalist ‘order’ gradually gives way to a socialist one.

It is evident that though Schumpeter agrees with Marx in that “capitalist evolution will destroy the foundation of capitalist society” and will eventually result in a new social order, the factors underlying this process of evolution in Schumpeter are very different from those identified by Marx. Class struggle, which forms the basis of capitalist instability in Marx, finds no place in the Schumpeterian framework. Indeed, according to Schumpeter, not only are there different alternative theories about the origin and nature of classes that make it difficult to identify them, but also “different interpretations will result from different definitions of class interest and from different opinions about how class action manifests itself.”

Therefore he rejects the Marxian theory that class struggle lies at the root of capitalist instability. His definition of socialism also differs significantly from Marx. Schumpeter defines socialism in a narrowly economic sense as “an institutional pattern in which the control over the means of production and over production itself is vested with a central authority.” In Marx, socialism means much more. It entails a classless society consisting of “generic men harmoniously united in the face of

26 Ibid. pp. 141-142.
In this form of a social order, public authority loses its political character because, in the absence of a ruling class, the very need for a political authority with its essential repressive functions vanishes. With the abolition of private property, with social ownership of the means of production, and with social control over production, credit institution and public utility services, civil society and individuals merge with each other. Thus Marx's socialism is not just an economic institution; it has broader social and political implications.

**Keynes:**

Keynes identifies the problem of *laissez faire* capitalism in "its failure to provide for full-employment and its arbitrary and inequitable distribution of wealth and incomes." While his theory does not directly address the second issue, he analyses in detail why the capitalist system cannot ensure full-employment on its own. Keynes' *General Theory* elaborates upon this theme in purely economic terms. There is no class conflict, no allusion that capitalism *must* give way to a new social order. If anything, there is an underlying optimism that the problem will be taken care of by the prudent policies of a reformist state within the bounds of capitalism. Thus he writes, "it is certain that the world will not much longer tolerate the unemployment which ... is associated - and, in my opinion inevitably associated - with present-day capitalistic individualism. But it may be possible by a right analysis of the problem to cure the disease whilst preserving efficiency and freedom."

The Keynesian theory of involuntary unemployment is in many ways similar to the Marxian theory of crises. Here also unemployment results from insufficient demand, more specifically, from lack of investment demand. However, in Keynes, the act of savings is totally disengaged from the act of investment. And since the act

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30 Keynes (1936), pp. 372.

31 In the last chapter of *General Theory*, Keynes nonetheless discusses how his theory, by removing the existing misconceptions about the role of savings in the growth process and by establishing that the savers and the investors are two different sets of people guided by different motivations, may pave the way for more egalitarian government policies in the form of higher direct taxes and lower interest rates.

32 Keynes (1936), pp. 381.
of investment depends on the entrepreneurs' expectations about future returns to investment (relative to the current cost of capital goods), expectation plays an important role in the Keynesian system in determining the level of output and employment. Producers produce only that much which they can sell; and they can sell only that much for which there is a demand. Thus output is demand determined. In so far as a constant proportion of income is always consumed, at any point of time, given the expectations of the capitalists, there is a certain investment demand, which in tern determines the aggregate demand and hence output. And since there is no reason why this output should coincide with the full-employment output, the economy is saddled with the burden of involuntary unemployment. With a Keynesian consumption function, with the rate of interest lying in the 'liquidity trap' range, and with unit elasticity of price expectation, a fall in the money wage rate if accompanied by an equi-proportionate fall in the price level, does not help because it leaves the investment demand unchanged. On the contrary, if a fall in the current price level entails a more than proportionate fall in the expected prices (that is, if the elasticity of price expectation is greater than unity), then the investment demand may shrink even further.

Strictly speaking, the Keynesian theory is not a theory of capitalist instability. The system is characterised by a stable short run equilibrium. It is only when one introduces a dynamic element into the system in the form of feedbacks from expectation to demand and from demand to expectation (as Harrod did) that the system becomes dynamically unstable.

As was mentioned before, the Keynesian (as well as the Harrodian) solution to this instability lies in government intervention. The government can increase the level of aggregate demand, either by directly increasing its expenditure level or indirectly by lowering the rate of interest which stimulates investment demand, so that full-employment is attained in every period.
II. Nature and Sources of Instability in Neoclassical Framework:

The neoclassical literature comprises a variety of models with different assumptions about the number of commodities, technology and technical progress, determinants of the savings functions and so on – the common unifying factor being the assumption of full-employment (implying absence of effective demand problem) and the assumption of perfect competition (implying equality of factor incomes with the respective marginal products). Each of these models has different stability properties. We however confine ourselves only to the stability analysis of those neoclassical models which have been developed in the earlier chapters.

We have used two neoclassical frameworks in our models: the overlapping-generations framework and the optimal growth framework (with identical households). The nature and sources of instability in these two frameworks are obviously not the same. But before we embark on a detailed analysis of the factors responsible for instability in each of these two frameworks, it is worth emphasizing (at the cost of repetition) that the sources of instability in our models are very different from those discussed by Marx and Keynes. In the purely neoclassical set up that we have considered, there is no space for a Keynesian effective demand problem. There is no separate investment function; all savings are automatically invested. By entrusting the households with the responsibility of savings as well as investment, we pre-empt the possibility of any kind of effective demand problem. Nor can there be any class struggle. That there cannot be any class conflict in an optimal growth framework with identical households is obvious. The owners of capital and the owners of labour are not two separate groups; all households are endowed with equal amount of labour and equal amount of capital stock. In the overlapping-generations framework of course there is a separation between the owners of labour (young generation) and the owners of capital (old generation). But even here there is no scope for a class conflict because the same person who is a wage earner (worker) today is a profit earner (capitalist) tomorrow. As Marglin says, this framework “embodies the Great American Dream, in which workers, by
dint of abstinence, become capitalists who live off their wealth during retirement."³³ Therefore any struggle between workers and capitalists implies one's struggle against oneself (or one's future self)! However, in so far as the savings decision of the current generation affects the position of the future generation (but not vice versa), there is an element of conflict implicit in both the frameworks – it is a conflict between present and future. But we shall discuss this problem and its implications for the role of the state in the next chapter.

There are two other points which we would like to emphasize here. In our models presented in chapters 2-6, we have identified some sources of instability within the neoclassical framework. But we have defined instability in a purely economic sense as a tendency of the capital-labour ratio to move away from its non-trivial steady state value. This instability manifests itself either in a monotonically rising or falling capital-labour ratio, or in cyclical fluctuations of the capital-labour ratio around an increasing or decreasing trend path. Such movements of the capital-labour ratio imply that the per capita income (or the trend per capita income) is either continuously rising over time, or is falling towards zero. This may have important implications for the social and political environment, and therefore on the capitalist 'order' as a whole, especially when the per capita income is secularly falling and approaching zero. However, we are not concerned about that. Our only concern here is the stability of the capitalist 'system' (and that too the neoclassical representation of the system), not the stability of the capitalist 'order' in general.³⁴ Therefore we are indeed guilty of taking "the institutional setting for granted", as Hahn accused, though we have made no attempt to "idealise it".³⁵

The second point is as follows: unlike the classical case, in our framework the system is unstable when it does not approach a steady state. There is a basic difference between our definition of steady state and the classical stationary state. We define the steady state in per capita terms so that it is the per capita capital stock and per capita income that remain constant. The aggregate output and aggregate capital stock grow at a constant positive rate (given by the rate of growth of

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³³ Marglin (1984), pp. 27.
³⁴ The terms capitalist 'order' and capitalist 'system' are being used here in the Schumpeterian sense.
population). Thus our steady state is a kind of quasi-stationary state where, though the aggregate income level is rising over time, the living standard of the population remains the same.

Let us now consider the overlapping-generations framework. For expositional simplicity, we shall restrict our analysis only to the one sector overlapping-generations model discussed in chapter 2. To recapitulate, in this one sector growth model people belonging to the younger generation save while the older generation dis-saves. The total product available in the economy at the end of any time period is distributed between the two generations in the following way. If capital depreciates at a rate $\delta$, then the total availability of goods in economy is given by

$$X_r = F(L_r, K_r) + (1-\delta)K_r$$

(7.1)

If $w_r$ represents the wage rate and $r_r$ represents the gross rate of return on capital, then we can write the above equation as

$$X_r = w_r L_r + r_r K_r + (1-\delta)K_r$$

$$= w_r L_r + (r_r - \delta)K_r + K_r$$

where $(r_r - \delta)$ is the net rate of return. Out of this total availability of goods only the wage part, $w_r L_r$, goes to the young generation. The rest (i.e., $K_r + (r_r - \delta)K_r$) goes to the old generation. Households of the young generation save a part of their income - the amount of savings being determined by their lifetime utility maximisation exercise. Let $s_r$ be the per capita savings thus determined. Then total saving by the young generation is $L_r s_r$. On the other hand, the older generation consumes the entire amount of goods available to them and this includes not only their income (net profit income $(r_r - \delta)K_r$) but also the capital stock that they own. Since the entire capital stock in the economy is owned by the older generation, their dis-saving (that is, excess of consumption over income) is given by $K_r$. Therefore total savings in the economy

$$S_r = s_r L_r - K_r$$

(7.2)
Since the savings in this economy are automatically invested, equating savings with investment, we get

\[ K_{t+1} = s_t L_t \]

One may recall that the above equation is the basic dynamic equation of chapter 2 (equation (2.1)). We can write it in per capita terms as

\[ k_{t+1} = \frac{s_t}{1+n} \]

Clearly the dynamics of the model depends crucially on the per capita savings function \( s_1 \), which has the current wage rate and the current interest rate as its arguments. \(^{36}\) Since both the wage rate and the rate of interest are functions of the capital-labour ratio \( k_1 \), we can express \( s_1 \) as a function of \( k_1 \) alone. In chapter 2 we have denoted this function by \( \phi \). Stability of the system depends on the curvature of the \( \phi \) function. A concave \( \phi(k) \) function will ensure stability; on the other hand, convexity of \( \phi(k) \) is sufficient for instability.

The exact functional form of \( \phi(k) \) depends on the specific utility function and production function that we are considering. But whatever be the specific form of the function, we can always write it as

\[ \phi(k) = \frac{\phi(k)}{w} \cdot \frac{w}{f(k)} \cdot f(k) \quad (7.3) \]

where the first term on the right hand side is the propensity to save out of wage income; the second term is the share of wages in total income; and the third term represents per capita output(income). Let us denote the first and the second term by \( s_w \) and \( \omega \) respectively. Then \( s_w \omega \) represents the savings propensity out of total income or the overall savings propensity. Let it be denoted by \( s_y \). Then the per capita savings function becomes

\[ \phi(k) = s_y(k) \cdot f(k) \quad (7.3') \]

Note that if \( s_y \) is a constant, the system is necessarily stable. Since \( f(k) \) is always a concave function of \( k \), a constant \( s_y \) implies that \( \phi(k) \) is also concave in \( k \). Thus the resulting equilibrium is always stable. This is exactly what happens when

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\(^{36}\) Actually per capita saving is a function of current wage rate and expected future rate of return. However in our static expectation framework expected return and current return are equal.
the production function is Cobb-Douglas (so that \( \omega \) is constant) and the utility function is either Cobb-Douglas or logarithmic (so that \( s_w \) is also a constant).\(^{37}\)

It is now easy to see that the source of instability in our one sector overlapping-generations model lies in \( s_y \) being an *increasing* function of \( k \).\(^{38}\) Obviously if \( s_y \) is increasing at an increasing rate and if this rate is sufficiently high, then \( \phi(k) \) will be convex in \( k \) (notwithstanding the concavity of \( f(k) \)).\(^{39}\) What does this imply? Note that the capital-labour ratio is monotonically related to the rate of interest. In fact rate of interest is a decreasing function of \( k \). Therefore a positive relationship between the capital-labour ratio and saving propensity implies that the latter is *negatively* with the rate of interest. The source of instability lies in this peculiar nature of the relationship between the rate of interest and overall saving propensity. When the capital-labour ratio is high and the rate of interest is correspondingly low, this low rate of interest induces people to save more – leading to an even higher capital-labour ratio in the next period. On the other hand, a low capital-labour ratio, which is associated with a high interest rate induces people to consume more today. Therefore savings fall, resulting in an even lower capital-labour ratio. It is this perverse relationship between the rate of interest and the overall savings propensity which is the root of instability in the overlapping-generations framework.

In the optimal growth framework (discussed in chapter 4, 5 and 6), instability arises through two different channels. Firstly, if the households rigidly maintain a certain minimum consumption level then an economy which starts with

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\(^{37}\) We have derived the specific forms of the \( \phi(k) \) function for Cobb-Douglas, logarithmic and CRRA-type utility functions in chapter 2, section IV.

\(^{38}\) As we have seen in chapter 2, even when \( s_y \) is a decreasing function of \( k \), the resulting equilibrium may unstable if the absolute value of the derivative \( ds_y/\!dk \) is sufficiently large so that \( \phi(k) \) is decreasing in \( k \). In this case the system will always show cyclical fluctuations around the equilibrium. Moreover these cycles will be explosive if the slope of \( \phi(k) \) (in absolute terms) is greater than unity at least at the equilibrium point. But this instability has more to do with the discrete-time nature of our model than with any specific behavioural assumption of the model.

\(^{39}\) If we have a function \( j(k) \) which is a product of two other functions \( h(k) \) and \( g(k) \) such that both \( h(k) \) and \( g(k) \) take nonnegative values and also \( g' > 0; h' > 0; \) and \( h'' < 0 \), then

\[
\begin{align*}
j' &= gh' + hg' \\
j'' &= gh'' + hg'' + 2h'g' 
\end{align*}
\]

Clearly if \( g'' \) is positive and sufficiently large then \( j'' \) will also be positive in spite of the negativity of \( h'' \).
very little capital relative to its labour supply may over time approach the zero production point. In such an economy the initial per capita capital stock may be so low that the minimum consumption level cannot be met by production alone. Maintenance of consumption level above production implies that the capital stock will get depleted over time – leading to economic retrogression. This result is rather obvious; it follows from the assumption itself. In any case, the fact that the necessity of maintaining a subsistence consumption requirement may make a poor economy nonviable is a result already established in the literature. However, by not defining the minimum consumption in strictly biological terms, we have placed greater importance on this source of instability than what the existing literature had hitherto permitted. We have introduced an element of instability into the model not through the production channel (whereby the per capita capital stock is too low to make the economy viable) but through the consumption channel (such that even though the per capita capital stock actually very high, the households may have even higher consumption requirements, which makes an otherwise viable economy nonviable).

The second source of instability in the optimal growth framework lies in the assumption that the households, though not absolutely rigid about the maintenance of a certain consumption level, are extremely unwilling to lower their consumption when they are poor. Thus whenever the present income, and therefore present consumption, is low, substantially large compensations are required to induce them to save. This fact gets reflected in a negative relationship between the instantaneous rate of time preference (or the instantaneous discount rate) and the level of current consumption. Even in this case an economy starting with a relatively low capital-labour ratio may approach a degenerate steady state. And it does so in spite of households following an optimal path. This is somewhat surprising because in this infinite horizon framework, households do take into account the utility level to be enjoyed by the future generations. A rise in the consumption level at any point of time in future ceteris paribus raises the total utility of the household. How is it that they still allow consumption to approach zero along the optimal path? The answer lies in the fact that the households while deciding on their optimal consumption path are not looking at the sum of present and future utilities, but rather at the discounted
sum of present and future utilities. A low consumption today raises the rate at which future utilities are discounted. Therefore, no matter how high the future consumption actually may be, it has very little significance today. The households are in effect considering a much shorter time span than infinity. It is this sort of a myopic behaviour that accounts for the instability in the variable time preference framework.

IV. Possible Bounds on the Capital-Labour Ratio:

Given that under certain assumptions the overlapping-generations and the optimal growth frameworks exhibit unstable dynamic behaviour in the sense that the capital-labour ratio is either secularly rising or secularly falling over time, are there some upper or lower bounds which may restrict such unstable movements? This is the question that we are going to consider here.

As we have seen, in the optimal growth framework, instability of the system never results in a secular rise in the capital-labour ratio; rather it is the opposite. Since there is no such explosive upward movement of the capital-labour ratio, the question of existence of an upper bound, which might restrict this movement, does not arise at all. In the overlapping-generations framework of course the question becomes very relevant. In the latter structure, if the rate of depreciation of capital is positive, then this immediately imposes an upper limit on the capital-labour ratio by the very fact that the net return of capital cannot be less than zero. For example, if $\delta$ is the rate of depreciation, then the limiting value of the capital-labour ratio is given by $\bar{k}$ such that $f'(\bar{k}) = \delta$. As we have discussed in chapter 2, if the capital-labour ratio rises above this level, then net rate of return becomes negative.

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40 Myopia is not probably the correct word for it. The households have perfect foresight; so they know what is going to happen. But they do not care. They are too concerned with their present consumption and the consumption in the immediate future; what happens at a sufficiently distant future point is of no consequence to them.

41 We are ignoring the cyclical fluctuations here.

42 Even when the capital stock does not depreciate, a finite limit to the per capita capital stock will still be set by the condition $f'(\bar{k}) = 0$, provided that the production function does not satisfy the Inada conditions. If Inada conditions are satisfied, then in the absence of any depreciation, per capita capital stock can take infinitely large values. In this case no finite limit can be set on $\bar{k}$ in terms of positivity of the returns to capital.
Therefore the households simply hold on to their savings without making them available for the production in the next period. As a consequence, production in the next period falls to zero and so does the capital-labour ratio (in production). What happens when \( k \) is equal to \( \bar{k} \)? In this case the current, and hence the expected, net rate of return on capital invested is zero. So the households are indifferent between investing and not investing (i.e., just holding on to their savings). Therefore the level of investment becomes indeterminate. This indeterminacy of investment level gives rise to a variety of possibilities: firstly, the economy may just stay at that point indefinitely, with some households investing and some holding back their savings, so that the aggregate volume of investment is exactly equal to the amount required to maintain the capital-labour ratio constant at that level (given a positive population growth rate). The second possibility is a fluctuating capital-labour ratio within the interval \((0, \bar{k})\). This happens when the aggregate volume of investment is such that it falls short of the amount required to maintain the capital-labour ratio constant at \( \bar{k} \). In this case, the capital-labour ratio initially falls below \( \bar{k} \), but immediately starts to rise (due to the unstable dynamics of the system) until it hits \( \bar{k} \). Then the process starts all over again. In both these cases, \( \bar{k} \) can be seen as some kind of a steady state (though not equilibrium), which the economy ultimately returns to.

There is a third alternative that presents a more dismal picture. In this case the amount of investment forthcoming at \( k=\bar{k} \) exceeds the investment required to maintain \( \bar{k} \); consequently the economy in the next period moves to a higher capital-labour ratio; net return on investment becomes negative; investment becomes nil; the economy hits the zero production point immediately after. Thus the upper limit defined in terms of \( \bar{k} \) does not necessarily arrest the unstable movements of \( k \). It may even result in an even greater instability in the sense that production suddenly falls to zero.

There is another possible upper bound on the capital-labour ratio which contributes more positively in restricting the explosive upward movements of \( k \). Note that if population is steadily increasing at the rate \( n \), then corresponding to any \( k \), \((1 + n)k\) is the per capita investment required to keep the capital-labour ratio
constant at that level. Therefore with a concave \( f(k) \) function, there is another possible upper bound on \( k \), given by \( \hat{k} \), such that \( f(\hat{k}) = (1+n)\hat{k} \). For any \( k > \hat{k} \), per capita output falls below \((1+n)k\). Hence even if the entire output is invested, the investment will still be inadequate to maintain that \( k \); so \( k \) must fall. Thus \( \hat{k} \) also constrains the upward movement of the capital-labour ratio.

Thus we see that in the one sector overlapping-generations model, there can be two upper bounds on the capital-labour ratio. The effective upper bound on \( k \) is given by \( \text{Min}(\bar{k}, \hat{k}) \). It is interesting to note that if \( \hat{k} \) is the effective upper bound in the system, then we can derive certain results about the existence and stability of the non-trivial steady state(s). Firstly, if \( \phi(k) \) is strictly convex throughout the feasible range of \( k \), \([0, \hat{k}]\), then, either there does not exist any non-trivial equilibrium, or \( \hat{k} \) itself is the equilibrium point. How so? Let us suppose that it is not true. In other words, let us suppose that there is a unique non-trivial equilibrium to the left of \( \hat{k} \), given by \( k^* \).\(^{43}\) Recall (from (6.3)) that

\[
\phi(k) = s_w \cdot \omega \cdot f(k)
\]

Now both \( s_w \) and \( \omega \) are bounded above by 1. Therefore for any value of \( k \), \( \phi(k) \leq f(k) \). At the equilibrium point \( \phi(k^*) = (1+n)k^* \). Since \( \phi(k) \) is strictly convex in \( k \), to the right of \( k^* \), \( \phi(k) > (1+n)k \). This is true for \( \hat{k} \) as well. Thus \( \phi(\hat{k}) > (1+n)\hat{k} \). Again, by definition, \( f(\hat{k}) = (1+n)\hat{k} \). But \( \phi(\hat{k}) \leq f(\hat{k}) = (1+n)\hat{k} \). So there is a contradiction. This proves our proposition.

Secondly, when \( \hat{k} \) is the effective upper bound, if there is any unstable non-trivial equilibrium within the interval \([0, \hat{k}]\), then there must also be a corresponding non-trivial equilibrium which is stable (locally). Moreover the stable equilibrium will lie to the right of the unstable one. The proof of this proposition also runs along similar lines. Let \( k^* \) be an unstable equilibrium such that \( 0 < k^* < \hat{k} \). Then \( \phi(k^*) = (1+n)k^* \). And also, to the right of \( k^* \), \( \phi(k) > (1+n)k \). But we know

\(^{43}\) Since \( \phi(k) \) is a strictly convex function, if such an equilibrium exists, it will always be unique.
that at \( k = \hat{k}, \phi(\hat{k}) \leq f(\hat{k}) = (1 + n)\hat{k} \). So within the interval \((k^*, \hat{k})\) there must be another point of intersection between \( \phi(k) \) and \((1 + n)k\).\(^{44}\) Let us denote the capital-labour ratio associated with this second point of intersection by \( k^{**} \). Then for any \( k \) such that \( k^* < k < k^{**} \), \( \phi(k) > (1 + n)k \); so \( k \) rises. On the other hand, for any \( k \) such that \( k^{**} < k < \hat{k} \), \( \phi(k) < (1 + n)k \); so \( k \) falls. Clearly then \( k^{**} \) is stable within the interval \((k^*, \hat{k})\). Therefore our proposition follows.

From the above two propositions, it is easy to see that in the one sector overlapping-generations framework, when \( \hat{k} \) is the effective upper bound on \( k \), any unstable equilibrium must have a stable counterpart. Therefore the system will be characterised by a unique unstable equilibrium only if the capital-labour ratio reaches some other bound before \( \hat{k} \). For example, in the second proposition discussed above, we can have global instability if the other upper bound \( \bar{k} \) is such that \( k < k^{**} \leq \bar{k} \). The actual values of \( \hat{k} \) and \( \bar{k} \) of course depend on the parameters of the system. The interesting point is that once we know the parameter values we can draw some inferences about the stability of the system by simply comparing the two upper limits \( \hat{k} \) and \( \bar{k} \) without explicitly solving for the steady state(s). For instance, if \( \hat{k} < \bar{k} \), and \( \lim_{k \to 0} \phi'(k) > (1 + n) \), then we know that there will always exist at least one stable equilibrium.

Let us now move to a discussion of possible lower bounds. Whether there is any lower limit on the capital-labour ratio which restrict its free fall toward zero is a question which is relevant not only for the overlapping-generations structure, but for the optimal growth framework as well. But it is difficult to conceive of any such lower limit on the capital-labour ratio within the bounds of neoclassical theory. We

\(^{44}\) Note that \( \hat{k} \) itself can be this point of intersection.
can of course say that there is a minimum wage rate (subsistence wage or some other wage rate, determined by external factors) below which the workers refuse to work. Therefore whenever wage rate falls below this level, there will be no supply of labour. But if such a bound exists then instead of checking the decrease in capital-labour ratio, it immediately takes the economy further back to the zero production point (since no output can be produced with a single factor). And in any case, imposition of any such lower bound on the wage rate violates the basic neoclassical character of the model. That such a lower bound may exist suggests a theory of wage determination significantly different from the marginalist theory, something that the neoclassical framework does not allow.

The fact that there does not exist any lower bound on the capital-labour ratio implies that when the economy is on a path of retrogression, it cannot reverse the process on its own. Interestingly, in both overlapping-generations framework and optimal growth framework, such instability results from individual optimizing behaviour. A question immediately follows: is there any role for the government here in stabilizing the economy? Moreover, granted that the government can play a role in stabilizing the system, what justification does it have for intervening in a process, which has been decided by individuals' optimization exercise? These are the issues that we take up in the next chapter.