

Review

Keynes economics of depression: The shipping industry as a case-study

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Abstract

The paper presents the arguments of British economist Keynes in relation to the economics of crises. The paper arises from the worldwide economic slump at the end of 2008, which resembles that of 1929-1933. Keynes argued that the earlier crisis was the result of waning confidence and the marginal efficiency of capital. The latter incorporates the prospective yield over the life of capital, the rate of interest and the production cost of capital. Current yield, as well as prospective yield, falls rapidly during a crisis, and this is related to three case-studies in the shipping industry, which are presented here as illustration of Keynes' arguments. Keynes found the source of crisis in the oversupply of capital goods. The rate of interest alone is unable to raise the marginal efficiency of capital, while there is no reason to expect the level of confidence to rise when there is falling effective demand. These relationships are discussed in this paper. Keynes showed how and when the marginal efficiency of capital can be restored. The central theme is the longevity of capital goods, as in a crisis one expects the supply of capital goods to be reduced in order to stimulate recovery. Similarly, ships have a productive life of over 30 years. This paper contributes new insights by examining how the world has changed since 1946, when Keynes died. The important lesson to be taken from Keynes is that economists can fix capitalism to prevent or cure crises. If the appropriate steps are not taken, nations will face unrests as people have formed long term expectations of a welfare state. But intervention, as prescribed by Keynes, is incompatible with the laws of the market that have prevailed since the 1970s.

Keywords: Keynes' general theory, Treatment of a Crisis, Application to Shipping Industry.

INTRODUCTION

The world economy was damaged by the banking crisis at the end of 2008, which started in USA. As a result, the views of the economist Keynes, who wrote about depression and crisis in 1936, have resurfaced. Indeed, Keynes' 1936 book could easily have been entitled: '*The Economics of Depression*'. Many economists and the author consider the crisis at the end 2008 as a twin sister of that of 1929-33. In fact investment in ships by ship-owners is very similar to the investment in houses. As this is known housing market was in the center of the financial crisis at the end of 2008. This crisis also by chance confirmed the long wave Kondratieff cycle which started in 1950 and should have ended in 2004 (or 2009 plus really). (A deviation of up to 10%, or 5.4 years, may be considered common). (it has been identified by the Russian economist N. Kondratieff to have an average duration of about 54 years. There is also the opinion that

the long wave Kondratieff cycle is explicated by the waves of innovations in the Schumpeterian sense of creative destruction) (Goulielmos, 2012).

By so saying we do not support the 'wave theory' due to Elliot as applied to shipping by Hampton (1990). We are supporters of the nonperiodic cycles derived from Theory of Chaos

In Keynes' work, 'crisis' is a characteristic of trade cycle. For Keynes, the crisis affects the volume of employment. The Trade Cycle is considered a highly complex phenomenon, and to be fully explained, it requires a holistic approach. This requires consideration at least of: consumption, demand for money, and marginal efficiency of capital.

If we wish to explain the regularity and cyclicity (cyclicality, as described by Keynes, appears when a system progresses in the upward direction, where forces

propel it upwards at first, gather force and have a cumulative effect on one another, but gradually lose their strength until at a certain point they tend to be replaced by forces operating in the opposite direction. These opposing forces gather force for a time, and accentuate one another, until they having reached their maximum development, wane and give place to their opposite) of the cycle, based on Keynes, the marginal efficiency of capital (MEC) is crucial. Things become more complicated by other short run variables, like the rate of interest. The cycle, for Keynes, is caused mainly by MEC. In essence, the Keynesian model is fairly simple, and it will be presented in outline in next three case studies of shipping industry.

Cyclicity, for Keynes, is the situation where an upward tendency is ultimately reversed. For a cycle there must be also a degree of regularity. (This position of Keynes was necessary to distinguish cyclicity from phenomena that were irregular, random, like e.g. weather, which is due to chance. These did not occupy science at Keynes' time. Regularity was what has put the crisis under the microscope of scientific analysis) which is evident in the sequence and duration of the ups and downs of the economy. Keynes defined crisis as the *sudden and violent substitution* of an upward tendency by a downward one.

Figure 1 summarizes Keynes' basic definitions for the cycle and the crisis. As shown in Figure 1, fluctuations in MEC - which is subject to complex influences - without any offsetting changes in consumption, cause fluctuations in employment. For Keynes, the fluctuation of the MEC, in a typical industry, is *cyclical*. Our opinion for, and experience with, MEC is that it fluctuates, but we do not support a symmetrical cycle up or down that repeats itself period after period. It is argued (Anonymous, 2012) that, more accurately, the change in expectations -and with it in MEC, which is the expected rate of return of an investment- on production, employment, global trade, and consequently shipping and demand for ships, was indeed the consequence of the 2008/09 financial crisis. Agriculture was examined separately and favorably by Jevons.

Purpose of the Paper

The paper presents Keynes' theory of Crisis based on his analysis of the Depression of 1929-1933, i.e. the General Theory of employment interest and money (1936). The ideas and concepts of Keynes are presented in three case-studies from shipping industry.

Structure of the Paper

The paper starts with a brief literature review. The paper is cast in five sections and three case-studies from shipping industry. The first presents the marginal

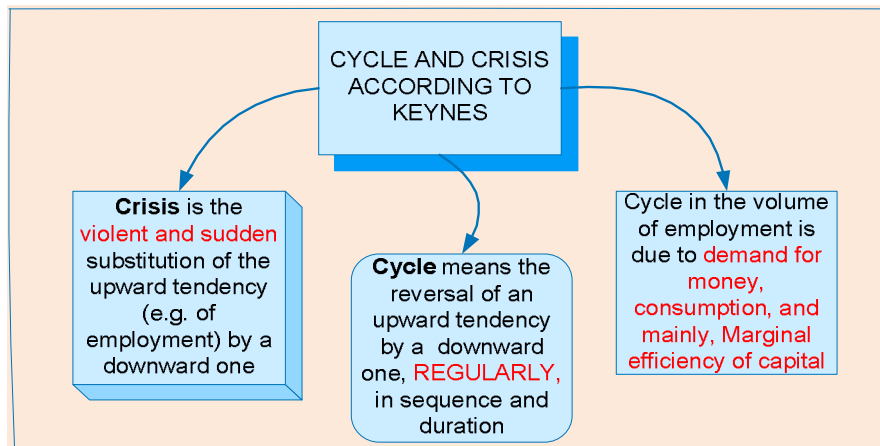
efficiency of capital and the level of confidence; the second presents the marginal efficiency of capital and investment; the third gives the probability of restoring the marginal efficiency of capital; the fourth connects the marginal efficiency of capital with time; and the fifth constructs a bridge between 1936 Keynes and present crisis; these are followed by conclusions.

Literature review

Krimpas (1974) argues that firms, when investing in fixed equipment, are giving hostages to fortune. Their expectations of future demand are crucial in determining their current actions. Expectations concern the net receipts expected from a certain line of investment and the discount factor, whereby these receipts can be turned into rates of yield, or determine the value of capital equipment, which makes profits possible. He conceives investment in two elements: ex post investment (curve E in Figure 2) and ex ante investment (curve I), and by so doing, he creates a link between each period and its successor. Technically, this is a major departure from the letter of Keynes' General Theory, but not from its spirit. The E curve is the one that links the evolution of the rate of profit with investment.

Curve E, the ex post yield curve, relates the expected rate of profit to the investment undertaken. Firms anticipate the rate of profit from the level of effective demand. This is the demand realized by using money; demand that has not remained at desire. Money is the language communicated by buyers and understood by firms in their production plans/budget/balance sheet, which in turn is the result of autonomous investment expenditure. Investment plans are revised daily, on information affecting expectations, and this produces Curve I. Curve I expresses the desired rate of investment, given investment demand and the resulting rate of profit. G is the final equilibrium point. In relation to long term expectations, Keynes splits them into two components: the marginal efficiency of capital and the liquidity preference (determining the discount factor to be applied to the undiscounted streams of expected profit compatible with the expected survival of the firm). Krimpas (1974) argues that the long cycles of technical progress, rather than the liquidity preference, may have been the primary cause of the collapse of long term expectations in the 1929-33 crisis. The world economy should provide good investment opportunities, but this happens in irregular bursts.

- Kaldor (1963) argued that the most plausible interpretation for the depression of the thirties' is the crash in the *marginal efficiency of capital schedule* and its subsequent collapse.
- Blaug (1997) argued that Keynes' business cycle is due to fluctuations in the MEC, which depends on



Source: Inspired by General Theory, Chapter 22.

Figure 1. Cycle and Crisis according to Keynes.

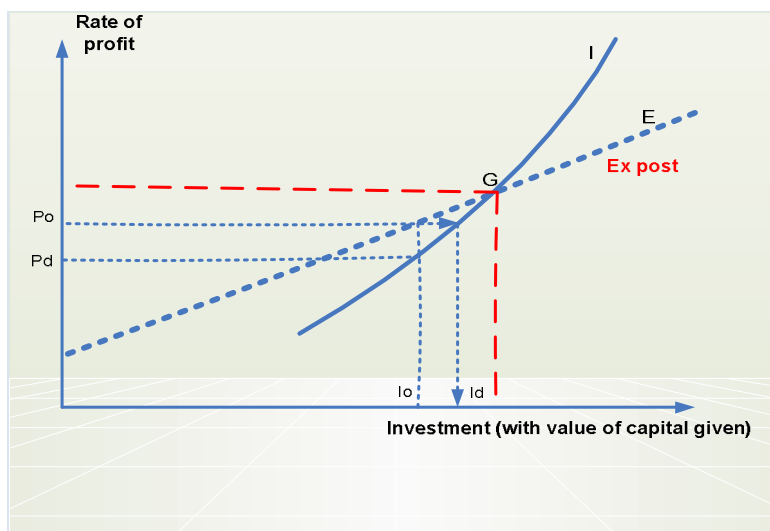


Figure 2. 'Firm's relationship between the rate of profit and Investment according to Keynes' spirit'. Source: Krimpas, 1974.

fluctuations in the expected yield of new capital goods. Not even changes in the rate of interest can cause a downturn, but the sudden collapse in MEC can; as this is possible also by the confidence with which the expected yield is anticipated. Downturns are, typically more sudden than upturns, producing a crisis.

The concepts of the Marginal efficiency of capital and the level of Confidence

(1) Marginal efficiency of capital: the key-Keynes' factor in a crisis

This is the earning power of the last addition in capital invested. This is also the relation between the prospective yield of one additional unit of a type of capital

and the cost to produce it. At the last stage of the boom, the start of the crisis takes place. The marginal efficiency of capital, the cause of investment, depends on the existing supply of capital goods, their current cost of production and the current expectations about their future yield.

Keynes believed that firms have a schedule of investments classed according to their marginal efficiency (MEI) given the prevailing rate of interest (the rate acts as a discount of the future expected yearly net revenues in a 'Net Present Value' process. The marginal efficiency of capital in the Net Present Value as process corresponds for economists to one figure: the 'Internal Rate of Return/IRR' for a whole period of say 20 years. This is found when net present value of the project is set equal to zero. IRR can then be compared with the rate

of borrowing (or LIBOR plus spread for shipping). This corresponds to MEC, but the supply price of the capital good should have not been raised in the meantime)- and given also the current level of confidence. If MEI is higher than the prevailing rate of interest, then one or more investments (current investment equals the current addition to the value of capital equipment resulted from the production of the period, called 'investment of the period' (p. 62-63, GT; GT=General Theory) will be undertaken. Our opinion and experience, supported by the wide-used method of Net Present Value, is that this statement is true –though it may be not as inflexible as we have put it above.

(2) The confidence level for Keynes : the moderator of MEC

The confidence level for Keynes (148-149 GT) is the degree of certainty we attach to our long-term forecasts. The actual level is derived from the observation of the markets and the business psychology, then we understand it, reduces investor's certainty about prospective yield to a lower portion than 100% -a situation during a boom- if a crisis is onset. In effect, *interpreting* Keynes by drawing on his idea of risk, we have to attach probabilities to expectations about yield from investment. So, for Keynes the mechanism of investment decision-making is intact ((Keynes' concept of marginal efficiency of capital is the same with that described in the 1930 work of Irving Fisher ('Theory of interest') as the rate of return over cost. Keynes defined MEC as equal to that rate of discount that would make the present value of the series of annuities given by the returns expected from the capital asset during its life just equal to its supply price (p. 135). Economists (Pearce, 1992) distinguish four terms: (1) MEC, (2) marginal efficiency of capital schedule (a long run concept; a stock), (3) marginal efficiency of investment and (4) marginal efficiency of investment schedule a flow)) and investments are made where the marginal efficiency of capital is higher than the prevailing rate of interest. It is clear that in Keynes' theory (:141), MEC not only depends on current yield (Keynes undervalued correctly the exclusive importance of the current yield – as seems used to hold at his time - of a new investment, and connected this more rightly to the expected yield over the life time of the capital good), but more importantly, on prospective yield, which is estimated as accurately as possible in an unknown and rather long future of up to 20 years or so. This idea really ties present to future.

Keynes no doubt focuses on uncertainty, because future is unknown and often it is impossible to establish exact probabilities for future. He speaks of animal spirits which are leading to investments in long run. He is in a very different position to the hegemonic assumption of rational expectations by most of the current economists before the crisis of 2008/09.

We believe that investors exist, and ship-owners are such, who do not bother to calculate internal rate of

return before ordering or buying a ship. The description of Keynes on page 150 fits very well to ship-owners with Keynes apropos reference to an investment...in an Atlantic liner...

As Keynes wrote "the outstanding fact is the extreme precariousness of the basis of knowledge on which our estimates of prospective yield have to be made. Our knowledge of the factors which will govern the yield of an investment some years hence is usually very slight and often negligible. If we speak frankly, we have to admit that our basis of knowledge for estimating the yield ten years hence of a railway, a copper mine, a textile factory, the goodwill of a patent medicine, *an Atlantic liner*, a building in the City of London amounts to little and sometimes to nothing; or even five years hence (italics added). In fact those who seriously attempt to make any such estimate are often so much in the minority that their behavior does not govern the market...If human nature felt no temptation to take a chance, no satisfaction (profit apart) in constructing a factory, a railway, a mine or a farm, there might not be much investment merely as a result as a cold calculation".

"Most, probably, of our decisions to do something positive, the full consequences of which will be drawn out over many days to come, can only be taken as a result of animal spirits– of a spontaneous urge to action rather than inaction, and not as the outcome of a weighted average of quantitative benefits multiplied by quantitative probabilities. We should not conclude from this that everything depends on waves of irrational psychology. On the contrary, the state of long-term expectation is often steady, and, even when it is not, the other factors exert their compensating effects. We are merely reminding ourselves that human decisions affecting the future, whether personal or political or economic, cannot depend on strict mathematical expectation, since the basis for making such calculations does not exist; and it is our innate urge which makes the wheels go round, our rational selves choosing between the alternatives as best we are able, calculating where we can, but often falling back for our motive on whim or sentiment or chance."

"If I may be allowed to appropriate the term *speculation* for the activity of forecasting the psychology of the market, and the term *enterprise* for the activity of forecasting the prospective yield of assets over their whole life, it is by no means always the case that speculation predominates over enterprise. As the organization of investment markets improves, the risk of predominance of speculation does, however, increase...Speculators may do no harm as bubbles on a steady stream of enterprise. But the position is serious when enterprise becomes the bubble on a whirl-pool of speculation. When the capital development of a country becomes a by-product of the activities of a casino, the job is likely to be ill-done" (GT:158-9).

Next we illustrate what the above mean in a capital-intensive industry like shipping.

Case-study 1: Shipping

The total cost of running a ship is made up by 3 main components: the capital cost, which can be about 50% of the total cost for a new ship (Kendall and Buckley, 1994), the 'fixed' running cost to be paid, if the ship is not laid up, and the cost due to voyages undertaken. When the ship is second hand, the capital cost may be lower than for a new one by 20% or even more.

Keynes imagined that services from new capital goods will compete with those of older ones and the former will be cheaper. But in shipping, older ships produce services that compete, *ceteris paribus*, with new vessels. The services (Ship-owners –at least Greeks–prefer second hand vessels under normal circumstances. In case of extreme levels of demand, second hand ship prices were higher than the new-building ones e.g. during November, 2007. This phenomenon is, however, rare. During a crisis when second hand ship prices fall, investors buy second hand ships larger and younger by replacing smaller and older ships) from second hand ships are *cheaper*, due to the dominant share of capital cost in total cost. This justifies fully the investment policy of Greeks in second hand ships for many decades, as this policy provided Greeks a part of their competitive advantage. Therefore, the existence (supply) of second hand ships *may preclude new capital formation*, given demand, until all second hand (competitive) tonnage (which is also more readily available) is employed.

So, in shipping, a crisis ends when all laid-up ships are employed (this can be called full-employment of all ships in the markets that follow pure competition. The paper assumes a framework that covers ocean-going ships for dry and liquid cargoes in private ownership). These ships help employment comparatively more than new ships, as new ships embody labor-saving technologies. Laid-up tonnage is therefore a factor that prolongs crisis, or delays recovery, and it may not be absorbed on average for up to three years continuously (Goulielmos, 1997), and not for a short time as some Norwegian maritime economists believed.

Laid-up tonnage is a manifestation of an unexpected fall in demand for ship space or a major rise of supply of new ships. This is really due to the inability of the industry to forecast; given also that investment decisions are independent. Their owners *hope* that the low level of freight rate pushed them out of the market, is temporary, and "soon" market will recover. As mentioned, Greeks in the 1981-87 crises waited for 3 continuous years before proceeding to scrapping their laid-up vessels.

According to Keynes, expectations about future play a dominant part in determining the scale on which new investment is thought advisable. Figure 3 shows a picture of the relationship of time charter and ordering of ships of the Cape type (Capes are ships, transporting bulk, too wide to transit Panama Canal unlike Panamax (60,000 to

75,000 dwt). They are usually over 100,000 dwt. In 2009 the market has used Capes of 170,000 to 180,000 dwt. They served well the China market. In 2007 (July) Capes had 126 million dwt (33%) and Panamax had 106 (28%) in a total for dry bulk of 383 million (Stopford, 2009:69).

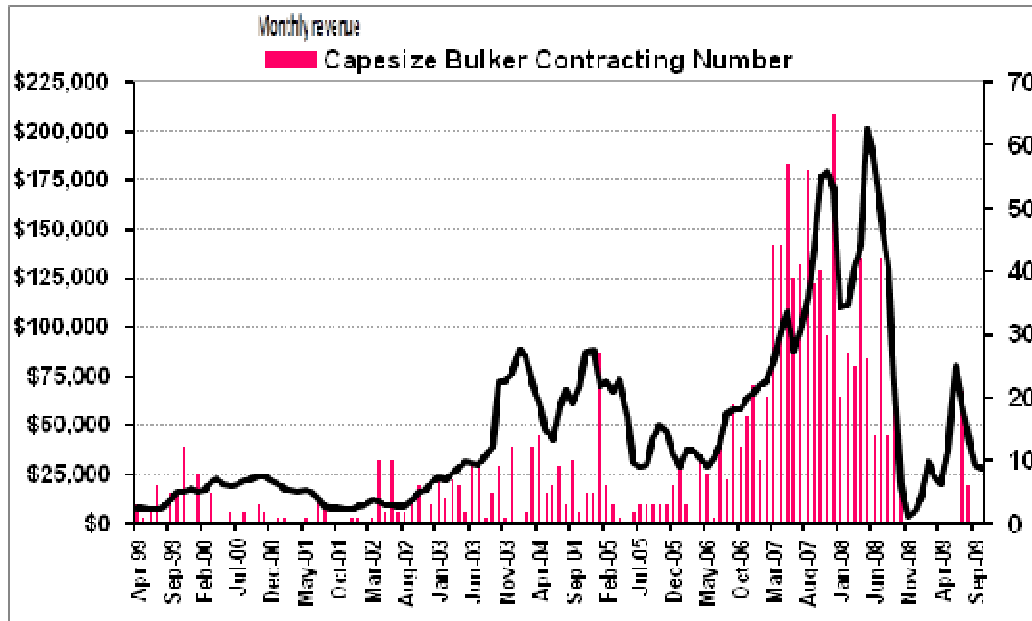
As shown in Figure 3, the ordering of ships is determined by the monthly time charter (with a lag of six months read from the chart). Keynes rightly insists on the prospective (long run) yield. This expected net yield of the investment in a Cape would naturally take into account ship's services over a whole say 30-year life. As Fearnley Consultants AS argued in 2005 (5th China Steel and Raw Materials Conference/ www.fearnresearch.com) if one bought a 1990 built Panamax in July 2003 and sold it at the end of 2005 the return on investment (ROI) would be about 850%. Keynes does not preclude the influence of the current price (spot freight rate), but he insists that this is not the exclusive, or the dominant, cause of investment (ordering).

The Marginal Efficiency of Capital and Investment

(a) Investment expectations

For Keynes the basis of investment expectations is very precarious, as mentioned. It is based on shifting and unreliable evidence. Moreover, it is subject to sudden and violent changes. Some economists explain crisis exclusively in terms of the rate of interest (certain economists stress the fact that the rate of interest is rising as the demand for money increases for trade and speculation and consider this as the cause of crisis). For Keynes the rate of interest may play an initiating part, or even an aggravating one, in a crisis, but *it does not cause the crisis*. The sudden collapse, (Keynes explains this point: 'during the boom much of the new investment showed a (not un-) satisfactory current yield' (commas added). 'The disillusion comes because doubts suddenly arise concerning the reliability of the prospective yield, perhaps because the current yield shows signs of falling off, as the stock of newly produced durable goods steadily increases'. This is no better description of shipping industry provided by Keynes in another context.) in the MEC is a typical, and a predominant, *explanation of any crisis*. For Keynes (p. 316 GT) *the collapse of MEC is due to the "disillusion that falls upon an over-optimistic and over-bought market"*. Keynes refers here to the 'organized investment markets', meaning of course Stock exchanges.

Interpreting Keynes, having in mind the 2008/09 crisis, one may think (Anonymous, 2012) that it is not so much the dismay and uncertainty that accompanies the collapse in the MEC, but this uncertainty is the cause of the collapse and the rise of the demand for money. If investment depends on the real interest rate (nominal rate less inflation rate), so, while the nominal rate cannot



Source: Clarkson's. Vertical axis shows time charter rates

Figure 3. Freight rates in monthly time charters of Capes and number of ships ordered, 1999-2009.

be negative, the real rate can be, when inflation is higher than the nominal rate, but in most cases recession is accompanied by deflation, which worsens the recession (debt deflation theory, deferring of consumption etc.). That is the case for certain economists: "inflate the economy in a depression". The basic rate of interest in Japan in the present crisis is practically zero, while in the United States it is 0.25% and in the Euro area 1.0%.

In the later stage of the boom (Keynes mentions the Stock Exchange, which he calls the organized investment market. There the players are three: (1) Buyers, largely ignorant of what they are buying, (2) speculators, who are more concerned with forecasting the next shift of market sentiment, and (3) those that form a reasonable estimate of future yield of capital assets; but when disillusion falls on an over-optimistic and an over-bought market, then it falls with sudden and even catastrophic force.), optimistic expectations, (we believe these are created by the rise in current yield and the favorable expectations about prospective yield. This is in line with Keynes GT) as to the future yield of capital goods are created, sufficiently strong to offset increasing supply and rising costs of production, and also a rise in the rate of interest. The dismay and uncertainty as to future, which accompanies a collapse in the MEC, (due to oversupply of capital goods), naturally precipitates a sharp increase in demand for money, and hence in the rate of interest, thus aggravating seriously the decline in investment. We may recall here that for Keynes 'investment' includes inventories.

The essence, however, is the fall of MEC. This is more valid for capital goods that had heavy investment in

the previous phase. For example, for Capes, as shown in Figure 3, orders fell to zero at the end of 2008 (crisis' start), but they used to be very heavy in the past due to their use in the trade with China. Deliveries, which are a proxy for orders, for Capes stand today at 92 million dwt by 2015, or one third of all dry bulk carriers to be delivered, are Capes (they are Bulk carriers too wide to transit the Panama Canal and over 100 000 dwt; between 170 and 180 K dwt or even larger. They transport iron-ore and coal).

Demand for money (for Keynes demand for money comes from the common need to hold money for anticipated transactions until next payment of income is made. Businesses do the same (working capital), and there is precautionary cash held for unforeseen opportunities and contingencies; and for speculation. Speculation thus determines demand for money, and so the rate of interest. Speculation in Wall Street led to the 1929-1933 crises. Speculation is subject to alternating waves of optimism and pessimism and thus ups and downs of economy are speeded up or down. Someone looking at this passage, due to Keynes, will disagree assuming that nowadays we are all speculators. Speculation, however, for Keynes is defined above beyond any doubt) for other purposes – apart from trade and speculation (Keynes was the first to introduce speculation in the determination of the rate of interest via the demand for money)– recovers after MEC collapses. Keynes distinguishes speculation which applies to the activity of forecasting the psychology of the market. Also, later, a decline in the rate of interest will greatly help

recovery. If the MEC becomes negative, nothing can be done to create investments (in the present crisis Japan has reduced the rate of interest to 1%), in this case by reducing (Banks will have no profit motive to provide loans at a negative rate of interest and they would do that only if subsidized by the State for their own positive cost of money) the rate of interest below -2%. On the other hand if the crisis can be remedied by a fall in the rate of interest (there is the opinion that the situation as described by Keynes is not uniform over sectors and permanent over time), this could easily be done by increasing the supply of money from central banks. But this is not the case, and moreover that today member-states central banks have lost control of the supply of money in EU.

Exception to the above argument is (Anonymous, 2012) the European Central Bank (ECB) and the Bank of England, who cut the basic rate of interest in the present crisis, and they were floating the banks with liquidity (base money). It could be that the banks do not concede credits and the quantity of money (M1, M2, M3), but of the monetary base, ECB has a good control.

Moreover, one may argue (Anonymous, 2012) that the most important part of the thinking of Keynes is not so much a focus on MEC, but on expansionary monetary (as he was skeptical on the efficiency of monetary policy in a depression) and on expansionary fiscal policy (especially public spending programs on infrastructure). Here is the deep difference between classical and Keynesian economists, i.e. in the necessity of government's intervention in the economy in a depression.

For recovery, the MEC must revive. But it is the uncontrollable and disobedient psychology of the business world that determines MEC. *It is the return of confidence that matters.* Confidence comes from current yield and moreover from prospective one, which in turn comes from effective demand. But this cannot be controlled in an economy of individualistic capitalism. Lack of confidence is the cause of the slump, but surprisingly this is emphasized by bankers and business men rather than by monetary economists.

(b) Time is needed for the recovery of the MEC

The trade-cycle needs time to recover, because the MEC needs time to do the same. Capital goods have long lives as they are durable, given the normal rate of growth of the economy. There are also carrying costs of the surplus-stocks of unfinished goods created by the slump. Keynes tries here (p. 317 GT) to explain why the downward phase of a cycle regularly lasts between 3 and 5 years. As far as the state of techniques is concerned, Keynes assumed (p. 245 GT) it as given.

At the crisis, and a while before, much new investment shows a satisfactory current yield (As shown in Figure 3 \$200 000 earned per month by Capes in

about up to April 2008, i.e. 7 months before collapse). Then, a disillusionment sets in, when doubts suddenly arise about the reliability of the prospective yield, as the current yield shows signs of falling off, as the stock of newly produced durable goods steadily increases; Keynes explains that the increasing production of capital goods (Keynes assumes a state of non-full employment and thus resources will be available especially as economy gets out of a crisis) leads to a fall in current yield, due to the oversupply of their services/goods, given effective demand, as mentioned. This description of Keynes fits surprisingly well in shipping industry, as shown below. This in turn erodes the confidence in the prospective yield, and the MEC falls. Production of capital goods is suspended and the supply price falls, which would improve the MEC after some time, but the rate of interest, also rises. This reduces the MEC. A role is also played by the cost of production of capital goods. The final outcome is a synthesis.

Shipping: 2nd case study

(a) Oversupply of ships

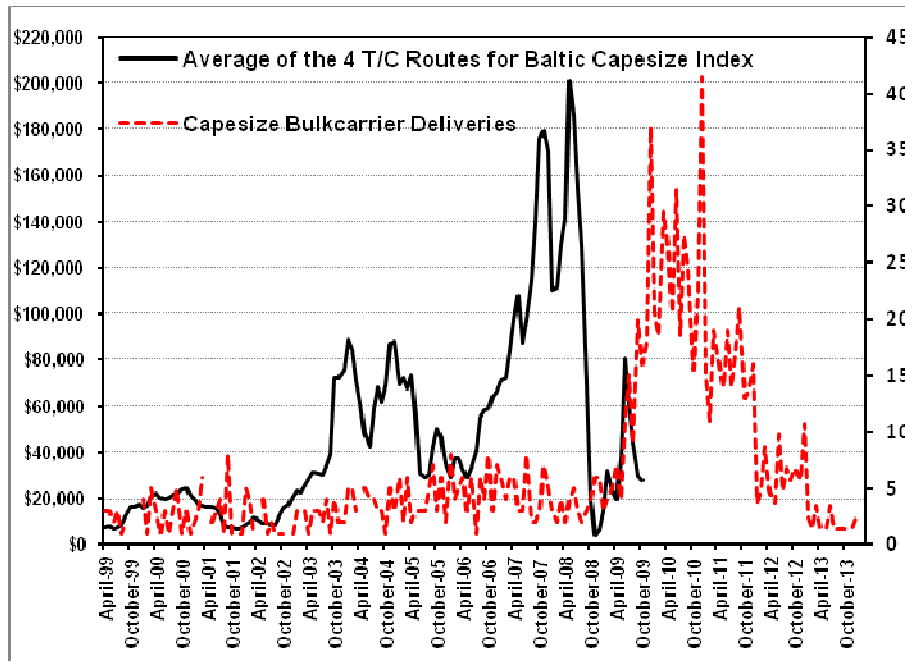
In shipping the fall in current yield is usually felt immediately by shipping firms, and moreover deliveries of ships continue for years into future, as shown in Figure 4.

The last collapse of the shipping market, at the end of 2008, was not due to oversupply of ships, but was due to the under-demand for shipping capacity. Oversupply no doubt will deepen the shipping crisis, given demand, and it will prolong recovery.

Figure 4 shows that deliveries of Capes continued through end of 2008 (October; start of depression), and these will continue well until 2013. Unless demand for ship space recovers, there is no way for the prospective yield from ships to recover before 2013, as shown by the solid black curve (Figure 4). Shipyards will then pass into relative unemployment for the years to come. However, a similar pattern in the freight rates can also be seen in the rates of deliveries, with a lag of 2½ years or so. We may even say that the freight rate pattern can *predict* the deliveries pattern 2½ years ahead.

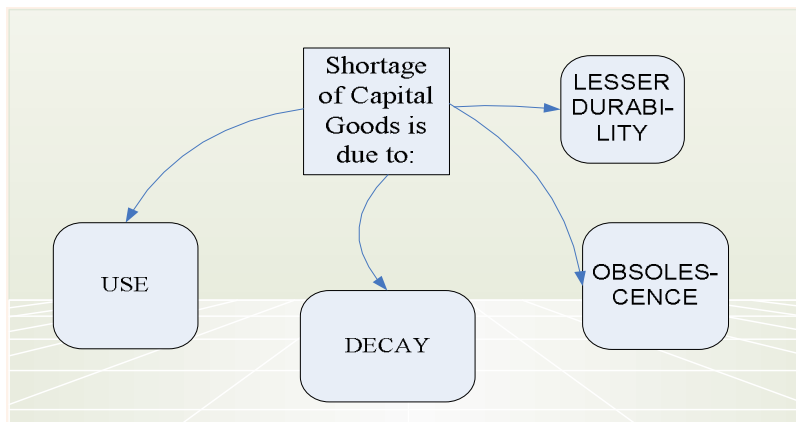
The true message of Figure 4 is that when market is high or very high as in 2007-2008, orders for new capital goods are placed (for ships) immediately to get rid of this lucrative situation. Deliveries, however, come after the construction time is over. The construction time lasts over 2 years in this case, and is longer, the stronger the demand for building ships, as shipyards build ships on the principle 'first come, first served'. The striking point of Figure 4 is that the pattern of the freight rates is similar to the pattern of deliveries, if we ignore time.

The banking crisis in USA, due to sub-prime house loans, affected the way banks used to provide 'letters of credit' for seaborne trade, which affected the



Source: Clarkson's.

Figure 4. Freight rate in TC for Capes, 1999 (April) to 2009 (November) and deliveries in numbers to 2013 (November).



(*) Source: General Theory.

Figure 5. Factors that reduce redundant capital goods.

demand for ship space. Keynes restricted his analysis to the power of the rate of interest to cause a recovery in investment (p. 378 GT).

Is the restoration of MEC possible?

(1) The factors and time needed to reduce existing capital goods Doubts (MEC will also be reduced if current costs of production are (or expected to be) higher during a slump) about prospective yield, when they begin, spread rapidly. At the start of the slump a lot of capital has a negligible, or even a negative,

MEC. Recovery happens if MEC is restored. Capital goods must become scarce. The shortage of capital goods can be achieved by certain factors (Figure 5).

In rigorous terms: $(MEC)_t = f(Dt)$ [1], where D is the average durability of capital and t=time required, or the time dimension of MEC. This is only a function and it simply means that *time is required* for capital to pass from abundance to shortage. The shortage will then cause MEC to increase.

Keynes recognized that time has to elapse before a shortage of capital produces a sufficient scarcity for the MEC to rise. To begin with, time is a function of the average durability/life of the capital goods as shown by

equation [1] above. Keynes argued that “the shorter the length of the life of durable assets, the shorter the depression time” (in Hansen, 1953, p. 208). Durability varies from one type of ships to the other and from one year to the next, as shown by Figure 7 below.

For ships, capital durability for banks is theoretically at around 15-20 years. But this is wrong, because in a crisis, and generally, the economic durability of ships alters at a cost and is also much higher as proven by the real figures (Figure 7). For Keynes each epoch has its own capital durability/life, but if the effective demand falls, the crisis will last longer. So, Keynes argues that the duration of a slump depends on the life of capital assets, and the growth of national economy. Keynes also argued that “the more rapid the rate of growth, the shorter the depression” (in Hansen, 1953, p. 210). This is why Krimpas (1974) talks about technical change. But will technical change shorten the life of capital permanently? Or will it create more frequent and shorter crises?

In shipping, technical change appeared in a discontinuous fashion during last century. E.g. high prices of oil in 1973 led to the introduction of oil-saving main engines. High loading-unloading time led in the 1960s to the introduction of container ships. Similarly, narrow openings into the hatches of the ships, led to the widening of same. Moreover, wooden hatch covers were replaced by metallic automatic foldable ones. Innovations were also made in cargo-handling devices. The most striking technical development in ships was their size, which increased with leaps and bounds due to economies of scale. Technical change in shipping is revisited below.

Moreover, MEC depends also on the carrying costs (these are charges associated with the storage of a commodity) (for warehouse, insurance, interest charge, loss of weight). According to accounting science three main types of stocks/inventories are: raw materials and consumer services, work-in-progress and finished goods for resale (Reid and Myddelton, 2005) of surplus stocks of unfinished goods (companies keep inventories. These may include: (a) finished goods, (b) unfinished goods, (c) raw materials and (d) goods in progress. (d) Is working capital for Keynes), which have been created during the slump.

Moreover, use means that more fixed assets are gradually used up (wear and tear) in providing goods or services over time, and firms charge part of a fixed asset's cost, as depreciation in the profit and loss account. Depreciation is no doubt an act of corporate saving, as it affects profits retained and not distributed to shareholders as dividends. As shown in Figure 5, obsolescence is one source of reducing capital (Keynes mentions that by 1929 in the USA a rapid capital expansion took place after 1924. This led to the creation of sinking funds and depreciation allowances for its replacement on a huge scale, with new plants. This corporate saving had to be offset by enormous

entirely new investment. To do this, new saving was required. Keynes stated that this factor alone was probably sufficient to cause a slump, and to prevent early recovery (p. 100). Sinking fund is a fund to accumulate a certain amount by a given date for the replacement of a physical asset (at the original amount). This is equal to original capital cost times $[i/(1+i)-1]$ to the power n , where i =rate of interest and n = the plant life in years. The sinking fund yearly amount is considered to be invested in securities) permanently, and this is beneficial to recovery.

Shipping: 3rd case-study

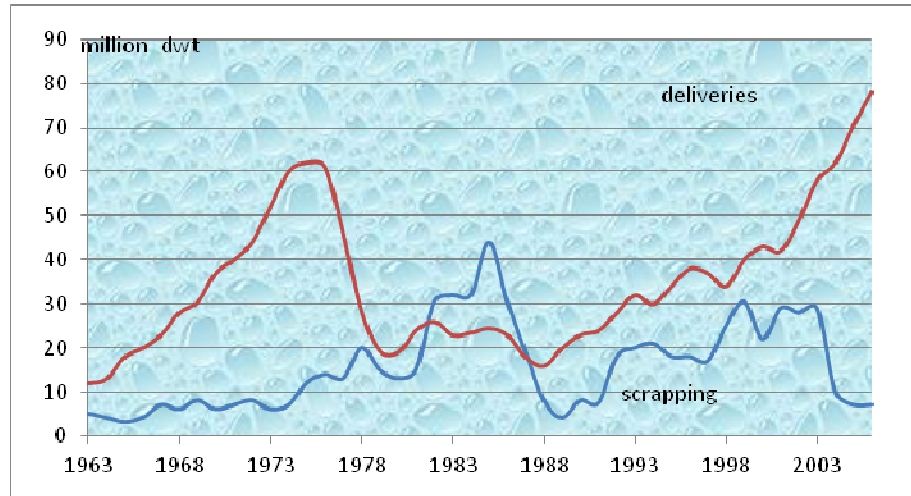
(a) Scrapping as a solution to the over-production of sea transport services.

Ships are also permanently removed from active supply if scrapped (Figure 6).

As shown in Figure 6, scrapping of ships, in 1963-1973, was a steady percentage (about 2%) of the fleet each year, and at a total of below 10 million dwt. Deliveries had a peak in 1975 (61 m dwt), building an up and a down pattern between 1963 and 1978. From 1983 to 1987 scrapping was at a peak reaching 44 million dwt due to the then deep and prolonged recession, caused by energy crises. Stopford (2009) called this period one of *distress scrapping*, meaning that shipowners had to sell ships for scrap seeking cash urgently. Also scrapping outweighed deliveries between 1981-1987 (a crisis). Deliveries were close to scrapping between 1987 and 2003. In 2004-06 (and until September 2008) deliveries *went completely out of control approaching almost 80 million dwt by 2006*.

In 2010 total deliveries for *all types* were 150 million dwt and accounted for 79 million dwt for bulk carriers (45%) (bulk, ore and ore/oil) and 45 million dwt for tankers (28%), a total of 124 million (UNCTAD, 2011). Scrapping in 2010 accounted for 20 million dwt for tankers and bulk carriers, which is 10 million dwt lower than 2003. Obviously scrapping alone cannot bring-in equilibrium.

A major proportion of scrapped vessels were tankers (25 million dwt in 1985), which were the victims of the firm confidence in oil transport and consumption before 1973. Scrapping resumed between 1992 and 2003, due to the age of 25-30 years reached by those ships built in the good times of the 1970s (in 1975, though a crisis year, Japanese yards induced orders at very attractive prices and terms. Japan to avoid mass unemployment in yards and thus having to pay unemployment benefits in thousands of workers as a result, devoted these amounts to subsidize ship prices and attract orders!). Scrapping reached the levels of 20-30 million dwt per annum over the eleven-year period between 1992 and 2003. This is related to the average durability of capital. The situation



Data from Stopford (2009).

Figure 6. Tonnage scrapped and delivered in the World 1963-2006 in million dwt.

is even better for recovery if scrapping outweighs deliveries, and demand for ship space becomes higher than supply. This happened only in 1981-1987. Massive scrapping promotes massive building when there is a fixed durability. Keynes we believe had this in mind.

Many maritime economists placed their hopes in scrapping to reach an equilibrium between demand for ship space and supply. It is obvious, however, that the present delivery tonnage amount, only of dry cargo ships of 274 millions dwt by 2015, would need 10 years of scrapping at an average annual rate of 27.4 million dwt to remove surplus. As building takes time, oversupply is built up gradually, and so scrapping is also gradual, based on the average economic life of a vessel. 274 million dwt of ships cannot be scrapped overnight, but if this were possible, recovery could be achieved next morning, given demand. Shipping can store redundant capital and bring a temporary equilibrium (i.e. through tonnage laid up). This is a fact of fleet unemployment. Current yield and prospective yield will not, however, improve until this is absorbed. As argued by UNCTAD (2010), demand (raw materials, steel, forest products, coke and potash) for major dry bulk services rose about 11% in 2010, due mainly to the trade with China. However the carrying capacity of vessels serving this market grew by 16%; freight rates fell as a result. The oversupply of vessels is the main cause of lower dry cargo freight rates (UNCTAD, 2010, p.75).

(b) Average durability of capital costs (ships).

The average durability of ships varies between decades.

Stopford (2009) found, in Lloyd's demolition register, ships that were scrapped at lives of over 60 or even 70 years, but also tankers scrapped when they were only 10 years old. To get an idea of capital average durability in shipping, in 2007, 216 vessels were scrapped at an average age of 27 years for tankers and 32 years for dry cargo.

As shown in Figure 7, the average durability of ships is round 30 years (tankers and bulk carriers) (1997-2007), and rising, following the upward trend of the freight market. The average ship life (30 years) is so long that it precludes the hope for fast recovery of shipping markets. It is surprising that tankers are more durable than bulk carriers by as much as 4 years. Figure 7 also demolishes the myth that ships live 15 (tankers) or 20 years (bulk carriers), an argument advanced by shipping finance banks. Figure 8 presents the picture after 2007 for the average age of ships broken-up of over 300 gt. Bulk carriers maintain the 30 year mark, while tankers reduced it to 28 years and went under that of bulk carriers.

As a rule, shipping companies can 'prolong' (Maritime economists that have predicted massive scrapping of ships that have reached a certain age have been, however, disappointed. Between 1988 and 1991, 55 million dwt orders of tankers placed on the expectation that tankers of the 1970s should be scrapped by the time they reach 20 years of age, but they were not. The durability of capital (ships) was wrongly determined at 20 years) the life of a profitable vessel or to shorten it for unprofitable vessels. The durability of capital (ships) was wrongly determined at 20 years).

This means to postpone repairs and maintenance so that only those that are absolutely necessary, for the ship

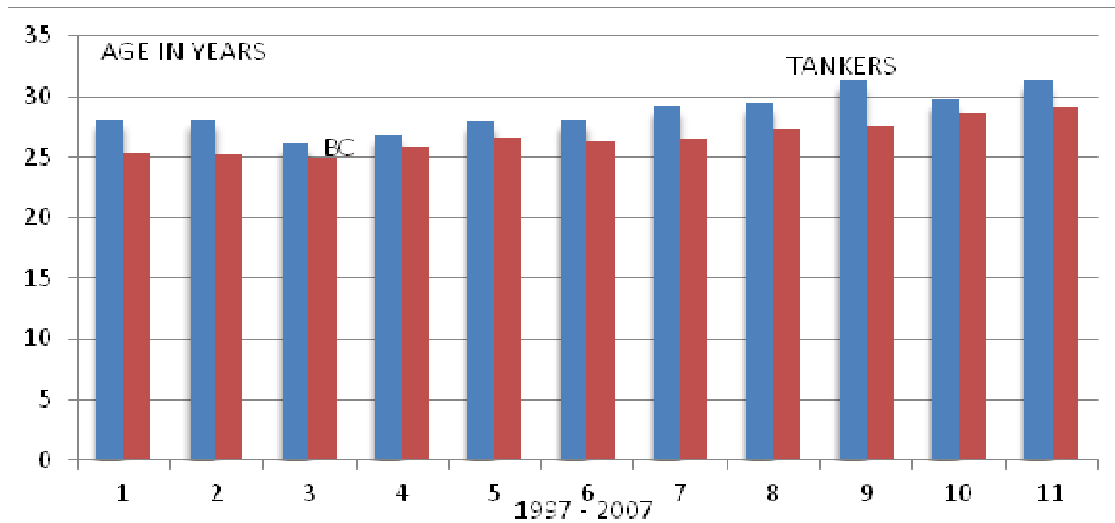
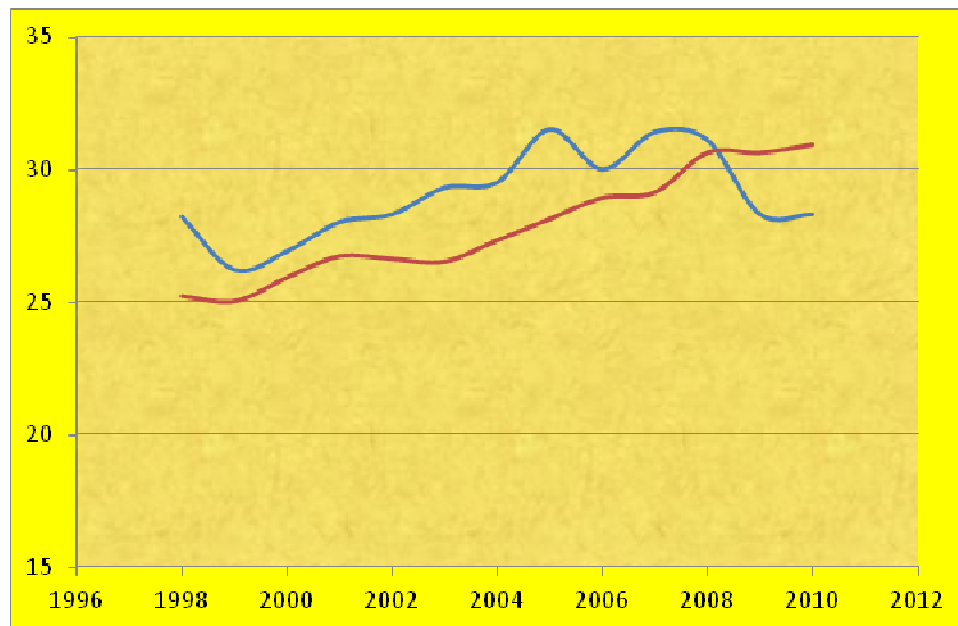


Figure 7. Average age of broken-up ships by type, 1997-2007, ships 300 gt and over. Data from ISEL (Bremen).



Source: UNCTAD, 2011. Vertical axis=average Age of broken-up ships in years. Horizontal axis: calendar years. Blue line=tankers. Red line=bulk carriers.

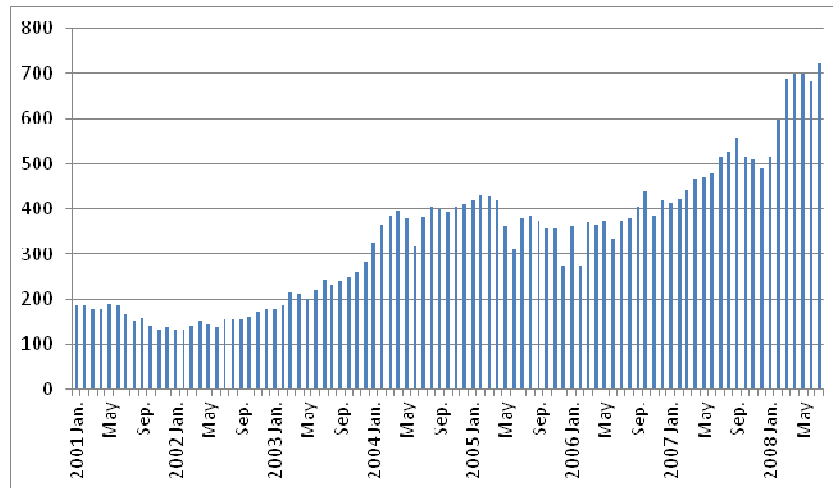
Figure 8. Ships broken-up, 1998-2010.

to be functional, are undertaken) the life of an unprofitable one, depending on the state of the freight market. Scrapping increases if the MEC is zero or negative or less than that based on the 'cost of money' for the remaining life of the vessel (including her scrap/residual value).

Technical obsolescence is also a slow driver towards equilibrium. Ships have been scrapped when they have been superseded by more efficient types, as happened with multi-deckers in the late 1960s, due to the appearance of containerships. Moreover, tankers with

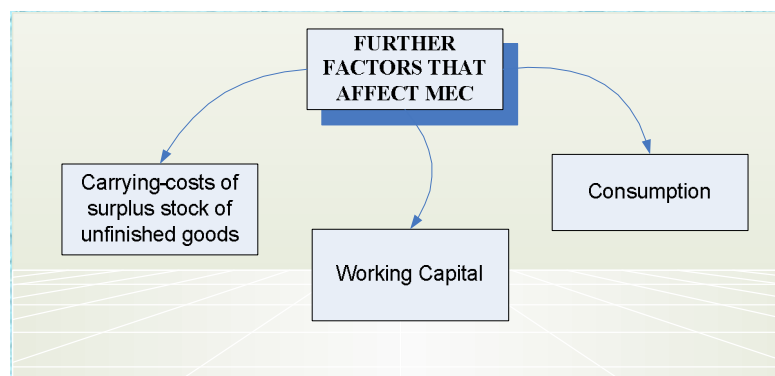
inefficient steam turbines were scrapped in 1970s. Obsolescence may also be of a *legal* type, as in the case of non-double hulled tankers. These causes, however, are rare, and follow after major technical developments; no one can rely on them for a fast recovery. Moreover, ships have lives that can be extended technically by the so called enhanced survey, as mentioned.

Scrapping is also affected by the scrap price (Figure 9), as scrap iron is used by steel industry, but this is a rather complex market, the analysis of which would lead us outside our main interest, which is the crisis. Figure 9



Vertical axis=US \$ per LDT-tons of weight of the ship in steel. Source: Data from ISL, 2008.

Figure 9. Monthly Prices of scrap for ships, 2001-2008, in Pakistan/India.



(*) Source: Keynes' GT, p. 318 and after.

Figure 10. Further factors affecting MEC.

presents scrap prices, which are also cyclical, and are influenced by the supply of ships, and finally by the freight market.

Shipping industry undergoes crises at the same time as the steel industry. Scrapping is a disinvestment affecting employment, and also depends on the MEC of second hand ships. The price of scrap in US \$ per light weight tons (weight of iron in a ship unladen/light displacement tons) in Pakistan and India was rising until July 2008. In the Far East average prices were lower – \$395 in 2008, compared with \$658 in Pakistan/India. The crisis at the end of 2008 affected the price of scrap and therefore the supply of scrap, although we would require data to verify that for after May, 2008. Depression brings more ships into scrap yards even at lower prices than before, but development in the scrapping nation must be maintained for the use of second hand steel.

MEC AND TIME

Figure 10 presents three further factors that affect MEC following Keynes.

A surplus stock (undesirable during depression) of unfinished goods is expected to be accumulated in a slump due to the sudden cessation of consumption and (new) investment. Keynes estimates that this stock entails a cost (Keynes did not explain how he arrived at that figure as a lower limit. This may include warehousing costs, insurance cost and cost for anti-theft means. In shipping, though services are not stored, capital goods are... And this is the cost undertaken by the ship-owner in a slump even when 'factory' is shut down. Ships are 'kept ready' to re-appear at a cost which is less than when the ship produces ton-miles) of no less than 10% per year, and as this is considered high by Keynes, it forces its

Table 1. The two phases of Crisis for Keynes.

<u>Phase I</u> : Crisis creates (undesired) surplus stocks of unfinished goods, where up-keep costs are at least 10% p.a.	<u>Phase I</u> : Early in slump, stocks of unfinished goods rise offsetting reduction in working capital.	<u>Phase II</u> : Working capital is reduced as production diminishes (due to slump). This exerts a strong cumulative influence on downward direction and recession begins.
<u>Phase II</u> : As slump continues, further reduction in both working capital and stocks takes place.	<u>Recovery Phase</u> : After the lowest point, stocks are reduced, while working capital rises.	<u>Recovery Phase</u> : both stocks and working capital rise.

Source: GT.

absorption, which is achieved within a certain period (so, Keynes considers this factor stable over time together with the average durability of capital) of 3 to 5 years. Most probably prices will fall to speed the absorption. This means negative investment (Keynes defines capital in three forms: fixed, working and liquid, where liquid consists of all unsold goods in stock), and a further reduction in employment.

In shipping, services *cannot be stored* and there are no 'unfinished services'... Undesired stocks of on board spare parts – bunker stores – are no doubt created, and new supplies of surplus stores are naturally suspended. These stocks are transferred to other ships, if there are no further voyages for her. But in shipping, the capital goods themselves can be stored at a cost (layup cost) in the expectation/hope of better days. These can return to the market within say 3 years in practice (Goulielmos, 1997). Moreover, laid up tonnage reduces employment for seafarers. What is the effect of a laid up tonnage on MEC? If the MEC is approximately zero, and if the expected remaining life of a ship is say three years, plus a scrap value less than the laid up costs, all discounted to date, then it is clear that -if the ship is laid up for more than three years- the cost of laying up is higher than the cost (loss) of running the vessel. Therefore the *expected* commercial age of the ship plays a role in scrapping, selling or laying up, as well as in the length of the layup.

The slump causes decline in production, and thus reduction in working capital, which is again a disinvestment, which in this case (of working capital) it may be *large*. Let construct a table to follow Keynes' reasoning for the two phases of the crisis. Table 1

A third factor, the reduction in consumption (Figure 10 above), then comes into play, as the decline in the MEC entails a severe decline in the market value of equities in stock exchange. There are people who borrow to invest in stock exchanges and these people will be less ready to spend more, if their income is reduced. Keynes had the UK in mind when he wrote GT, but for this to be true a crisis must reduce dividends. Income may accrue also from the sale of shares. Keynes was the first to introduce rentiers (rentiers are people owning

capital and derive all or most of their income from this source) into the picture. Effective demand is finally reduced.

Keynes did not provide a theory of what might be a firm in his model. This absence led to a confusion between the notions of real and financial capital, as well as the role of a stock exchange in the determination of investment intentions. It was Kaldor (1963, 1972) and Marris (1968, 1972) who introduced firm, as well as the concept of the rate of profit. However, they used classical assumptions, and not Keynesian (post-Keynes) ones. Technical change is believed to be the missing element in their writings according to Krimpas (1974).

The Post-Keynes Developments

It is natural to connect Keynes theory with developments since his time, though this has nothing to do with Shipping and /or MEC. The Bretton Woods agreement (1944) established the adjustable peg system. Currency parities were then maintained within 1% of predetermined rates and allowed to change only in the case of a fundamental disequilibrium. The system worked smoothly between 1950 and 1970, with high rates of growth and increased international trade. Standards of living rose, until stagnation and inflation emerged at the same time, between 1970 and 1980. Academia then produced models based on game theory, monetarism, rational expectations and new assumptions about economic behavior. The ideas of Keynes were eclipsed from 1990 to 2000 (Blinder, 1988), and returned for good with the crisis at the end of 2008.

The dollar on the other hand acted as an international reserve currency, while international movements of capital were liberalized. France and Germany argued that USA exported its inflation with its expansionary policy. USA pointed out that the trade surpluses of these two countries were high, and they were also refusing to revalue its currency. The same happens today between USA and China, where China refuses to alter its currency parity as USA wants. It seems that there is an

incompatibility between internal economic policies, where Governments need to be re-elected, and a common economic international policy...

Fixed parities, some argued, were incompatible with a free market. The system malfunctioned due to the unequal distribution of world income, the expansion of internal markets, and stagnation of the world economy. USA, in a sense, was responsible for the liquidity of the world system, but the war in Vietnam raised disputes as to whether USA could have adequate reserves (gold) to guarantee (shipyards preferred last 5 years or so the € to the \$ in shipbuilding contracts) all dollars in circulation worldwide, and at the same time keep 1\$=1/35 ounces of gold. In 1971 President Nixon announced that the dollar was no more fixed and redeemable for gold, and put a 10% tariff on imports. Parities floated. The Bretton Woods agreement collapsed (1971). Most foreign exchange parities floated upwards against the dollar.

Moreover some argue (Anonymous, 2012) that the fall of 'Bretton Woods' was a consequence of the increase of global capital movements, the liberalization of international capital flows and the increasing interdependence of financial markets and banks. This led to higher volatility in exchange rates and interest rates and in contagion of a crisis from one country to another.

At the end of 1971, the Smithsonian agreement was settled by the G10 in Washington, which created new fixed parities that could vary by more than 1% (2.25% - 4.5%). One \$ was fixed to 1/38 ounces of gold (8.58% devaluation). In 1972-1976 certain countries, and EEC, apart from Germany, withdrew from this agreement. The first energy crisis appeared; countries withdrew their drawing rights from IMF, and returned to fixed parities. The European monetary system (in 1978-1979) led to a rather stable parity of the European currency, the Euro; to maintain this between 1980 and 2000 proved very difficult.

The credit and financial system underwent changes since 1946. Capital markets are now globalized. The supply of money that Keynes assumed inelastic and controlled by central banks, which determines the rate of interest, together with the demand for money, is no longer in the complete control of the various authorities at least in the member-states of EU. Increasing money wages, e.g. in a country like Greece, not dictated by a rise in productivity, led to a rise in prices and curtailed exports and raised imports. In the past this could be accommodated by a devaluation of the national currency, but with a relatively fixed parity Euro, this could not be done. Competitive production is thus the only way that the EU can seek convergence. Germany leads the way in EU using the principle of living to work, followed by France.

The Global Recession in 2008/09 had its origins in the financial crisis in the United States (Anonymous, 2012). This was the consequence of the not sustainable expansion of the housing market (which occurred also in

Spain, Ireland and the United Kingdom). Some call it a speculative bubble – fuelled by a credit expansion and lax monetary policy since 2000. Important are also the new financial instruments -securitization of mortgages and other credits- like expansion of new financial instruments in the securities and derivative markets (Mortgage backed assets MBAs, Collateralized Debt Obligations CDOs, Credit Default Swaps CDS), which led to excessive risk taking and leading to mortgage lending without risk assessment of the debtor and partially to predatory lending. The credit expansion led to unsustainable expansion of the civil construction industry by the expectations of steadily rising house prices. When the boom bust cycle ended, financial markets all over the world panicked, liquidity in the interbank markets vanished and interest rates soared, stock-markets plummeted and many countries of the world went into deep Keynes, and Keynesian expansionary monetary and fiscal policies, were back to save the financial system and save the world from a new Great Depression like that in the 1930s.

As Soros (1998, 2008) argued, the undisputed faith in market forces makes us blind to a degree that we cannot see the character of the crucial instabilities that cause a crisis, which has the dynamism to get worse as time goes by. Moreover, the dominant paradigm, that financial-economic markets *tend to equilibrium*, and the deviations from that are simply random, is wrong and misleading (Stiglitz, 2011, p. 305).

As Stiglitz (2011, p. 263) argued the last crisis showed that though State cannot oblige markets to price risk correctly, it could draft regulations (and providing motives) that minimize the damage that comes from the wrong estimations of the markets.

Communism with centralized planning and state property of the means of production failed. Free market capitalism in the neoliberal sense failed also in the present crisis. Keynesian politics failed in the 1970s to combat inflation, but now it seems the only recourse to save the world from a second Great Depression (Anonymous, 2012). Despite what has happened in certain countries, the welfare states of the Nordic countries (Norway, Denmark, Sweden and Finland) explained the success of Sweden: p 257 in the Greek translation) are running very well (especially they are in front measured by the Human Development Index of Sen), though they are in the same situation like Greece, Portugal, Ireland, Spain and Italy, with debt problems and adjustment problems, because the Nordic countries have their own currency (Anonymous, 2012).

CONCLUSIONS

During a downward phase, both fixed capital and stocks of materials become redundant, and working capital is reduced. The MEC falls to such a low level that any new

investment is suspended for any practicable reduction in the rate of interest. Consumption, which is most needed, falls off too due to falls in stock market values. A far-reaching change in the psychology of investment markets - which there is no reason to expect - is then needed to preclude unemployment.

The three case studies drawn from shipping industry –a capital intensive industry- showed that Keynes' General theory, in another context, photographed it, especially as shipping industry –in its majority- does not resort to world stock exchanges. Crisis –coming from outside the market- curtails prices (freight rates) and reduces current yield in a permanent way, sending redundant ships to lay up, so that to anticipate a great fall in the prospective yield and a shake in confidence level. Orders of new ships fall off, but the situation gets worse, as deliveries, that have a long tail, multiply supply of capital goods (ships) against a weakening demand. Ships laid up for more than three years are led to scrapping, a fundamental function for shipping and Keynes to restore MEC. These two processes are, however, slow, refuting Keynes saying of a 3-5 years crisis. Shipping has no goods (services) in stock, but it has capital goods in warehousing (laid-up) at a cost. This is *mutatis mutandis* 'unfinished goods in surplus', as mentioned by Keynes.

Recovery needs the MEC to be above current rate of interest and for there to be a sufficient level of confidence in MEC calculations, at the same time. Both are required for recovery. But recovery needs 3 to 5 years to work for Keynes. Governments must take care to restore the level of confidence first and afterwards work to improve the expected yield of investments in any way they can. Governments, at the time of Keynes, could issue new money and finance public works to create effective demand, as private investors could not. In debt situations –as in my Country- public investment is greatly reduced to cut on public spending. This obviously creates a deadlock.

As a further conclusion, the writings of Keynes dealt with unemployment, due to managerial inability to foresee future, and are quite contemporary as far this cause is concerned. Whatever is the depression it must be allocated fairly. This is not so obvious for my Country. On the other hand, the burden of depression falls mainly on the newly-unemployed in certain countries.

The welfare state created from the Keynesian philosophy - which under the pressure of corruption/exploitation has failed - has been now replaced by a new model. As a retrospect, the model of socialism has failed, and that of the welfare state (the unemployed in the USA and in the UK prefer to live on unemployment wages than to work), in certain countries, has been made to fail, too. Both stood up philosophically, given freedom of will, but they failed in terms of their practical implementation.

This is a vicious circle. A model fails, and then we move on to the next. This fails too, and we return to the

first one, which also fails. We do not examine why a good model has failed, and then correct it. Keynes passed on the responsibility of facing up to the consequences of the crises in governments, and thus people expect that to be done. If it is not done, upheavals may follow. Governments must guarantee employment for all who want to work, at a survival wage, even during slumps, and provide medical care whether one works or not, and free education for all, security and quality of life, (Gregory et al, 2009) , the right to a respectable pension and so on and so forth. Otherwise, economists have failed as engineers of the economy and they are engineers of poverty.

It was a mistake to abandon Keynes, we believe. But the important conclusion of Keynes at the end of Part II, Chapter 22 of GT is crucial: "The duty of ordering the current volume of investment cannot safely be left in private hands". This is a reply to Marx, who thought that capitalism creates crises; for Keynes economists in the public sector may fix them.

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