The Relevance of Haavelmo’s Macroeconomic Theorizing for Contemporary Macro Policy Making

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Abstract

The recent great financial crisis and the ensuing deep recessions have placed in sharp relief the fundamental issue of how financial factors, including financial instability, interact with the real economy. In order to understand the nature of these interactions and formulate policies that would help contain adverse outcomes it is essential to have an adequate conceptual framework. Unfortunately, the standard DSGE approach is deficient in this regard. This paper contends that Haavelmo’s macroeconomic theorizing provides a better starting point for forging the required integration between the financial and real sectors. The paper extends the basic Haavelmo model to the contemporary scene and uses it to shed light on policy solutions to the current predicament.

Keywords: financial crisis, investment, monetary and fiscal policies

JEL classification: E22, E44, E52, E63

Paper for presentation at the Trygve Haavelmo Centennial Symposium, University of Oslo, Oslo 13-14 December

December 6, 2011
1. **Introduction**

The recent great financial crisis and the ensuing deep recessions have placed in sharp relief the fundamental issue of how financial factors, including financial instability, interact with the real economy. In order to understand the nature of these interactions and formulate policies that would contain adverse outcomes it is essential to have an adequate conceptual framework. Unfortunately, as many commentators have noted, the framework that is in current widespread use, namely the “new neoclassical synthesis” between the real business cycle (RBC) and the “new” Keynesian approaches, otherwise known as the DSGE approach, is deficient.\(^1\) While the standard DSGE formulation provides a role for monetary policy in the form of an interest rate rule (Taylor rule), and an elaboration of how consumption and investment are affected by the interest rate settings (usually smoothly), it did not until very recently provide any explicit role for financial intermediation, nor of liquidity preference based portfolio behaviour, and their respective influences on the real economy.

Issues of financial intermediation were dealt with separately. Any implications for the macro economy were confined to studying possible amplification effects that the financial sector could exert on real sector disturbances.\(^2\) For example, under the financial accelerator hypothesis, a real shock to the net worth of firms lowers their eligibility for credit thereby constraining their outlays, which in turn could further erode net worths and cause a downward spiral. The possibility that the financial sector could itself be the source of disturbances that impact on the macro economy, as occurred during the recent crisis, was neglected. Several patches are now being proposed to overcome this inadequacy. These involve introducing financial frictions into the standard paradigm, with the preferred method that of providing a bridge to the financial intermediation literature by re-specifying the

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\(^1\) See especially Caballero (2010), Leijonhufvud (2009), Pesaran and Smith (2011), Stiglitz (2011), and Woodford (2010). The last, while a progenitor of DSGE modelling, is critical of the lack of integration with the financial side.

\(^2\) See Bernanke et., al. (1999)
“credit channel”. 3 Financial frictions can exert an independent effect on financial intermediation itself. For example, an adverse financial shock such as a “toxic shock” can cause a breakdown in trust between the financial institutions, which in turn lowers the availability of credit to the real sector thereby leading to a reduction in its outlays and a slowdown in activity. This approach has some plausibility, as there has been a marked decline in loans from the financial sector to the small and medium-scale enterprises in particular. On the other hand, banks have attempted to become more liquid. They also complain that there is a dearth of viable projects on which to lend, and that in the current recessionary context loans are frequently demanded merely to cover losses being incurred and to finance interest payments due, but not for investment. In contrast, many larger firms increasingly prefer to hold cash and have reduced their demand for loans, while also engaging in buybacks of their outstanding shares. Given these firms’ prime debtor status as a result of their cash holdings and the unprecedented low interest rates that central banks have set, their curtailment of capital accumulation and merger and acquisition (M and A) activities appear puzzling. This indicates that there may be deeper causal factors at work than just impediments to the credit availability channel, and that a more fundamental integration between the financial and real sectors is needed. 4

The standard paradigm suffers from several other problems that affect its realism and scope, some of which should be noted here. Various frictions are usually introduced in an ad hoc manner such as the financial ones mentioned above so as to ensure a better match with the data. These frictions are typically viewed as impediments of temporary duration that

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3 Of particular interest is Brunnermeir (2011), and Kiyotake and Gertler (2011)  
4 Although the earlier IS/LM reference framework includes portfolio behaviour with an emphasis on liquidity preference, its postulated linkage with the real sector is problematic. For example, if liquidity preference increases and interest rates rise, the IS/LM approach indicates that investment and output would decline, and that this would reduce the demand for liquidity and restore equilibrium. Aside from the problematic natures of the investment function assumed, and the interest rate equilibrating mechanism, the ensuing adjustment have dynamical implications, including changes to expectations, but IS/LM is unable to take account of these factors. Essentially, it is a static mini-Walrasian approach that is imposed on an inherent dynamical process.
slow down adjustments to the competitive market equilibrium. For example, to allow for observed fluctuations in unemployment sticky prices are introduced the effects of which should dissipate over time. However, if they do not this would be regarded as symptomatic of structural deficiencies and reforms would be required so as to improve price setting practices and market efficiency.

Another problem with the standard paradigm is that it restricts the use of stabilization policies to the monetary instrument. This follows, in particular, from having consumption behaviour determined in accordance with the Euler conditions of intertemporal maximization, with the result that the main vehicle for affecting it is through interest rate changes. In this setting a stabilizing role for fiscal policy is ruled out, at any rate one on traditional Keynesian lines that involve multiplier effects operating through induced fluctuations in income. Yet in the face of slumping consumption and falling investment it is precisely the traditional Keynesian fiscal policy that was invoked during the recent crisis. The standard approach does not take account of the possibility that financial shocks could so adversely affect balance sheets as to override intertemporal optimal consumption plans. The household is forced to comply with the balance sheet dictated requirements, for example, it may have to meet loan requirements such as servicing a mortgage. In a constrained cash flow situation the household may have no other alternative than to adjust their consumption in accordance with immediate contingencies, in effect reproducing some elements of a traditional Keynesian consumption function.

Another significant problem is the lack of a fundamental liquidity role for money in particular. The standard paradigm’s assumption of complete markets together with full information implies that once an asset or commodity is priced it can always be sold at any time. This makes nonsense of any claims that some assets are more liquid than others.

—Woodford (2011) has raised the issue of fiscal policy in a DSGE setting, but its impact is on modifying labour-leisure tradeoffs and not aggregate demand.
However, in practice this is not the case and people do find it convenient to hold non-interest bearing money which they can readily deploy when the need arises. More generally, this is a result of operating in a world of Knightian uncertainty and uninsurable contingencies and incomplete markets in an environment dominated by nominal money contracts.

A useful, realistic, framework that better copes with the type of crises now being encountered is needed. It should be less exposed to the problems ascribed above to the standard paradigm. This paper contends that Haavelmo’s macroeconomic theorizing provides a suitable starting point for forging the required integration between the financial and real sides, and for addressing the other problems noted above. In his conceptualization of macroeconomic phenomena, Haavelmo kept coming back to a basic model that he had formulated in the 1950s. Versions of this model are to be found in his treatise on investment published in 1960 henceforth IT, and in lecture notes written in Norwegian that he eventually presented in 1966 as a study on macroeconomic theory, henceforth SMT. This model integrates balance sheet transactions with flow activities such as production, consumption, and investment; allows shocks emanating from either the financial or real sides to impact on the other; and provides a unified account of how under employment and full employment can be generated. It also provides a natural transition to the longer-run temporal issues involving business cycle fluctuations and secular growth.

Regarding Haavelmo’s mode of theorizing there is often an air of deceptive simplicity about the models that he presents. This is because of his conceptual focus on the interaction of major behavioural drivers such as optimization and arbitrage and the institutional

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6 Haavelmo (1969) elaborates on this.
7 The latter is the more complete version and I shall draw upon it, specifically the version presented in chapter 26 of SMT. In preparing this paper I have been enlightened by the penetrating discussions in Anundsen, et al., (2011), Andvig (1993), and Moene and Rødseth (1991).
8 The presentation of Haavelmo’s short-run model here is similar to that contained in Anundsen, et al., (2011), but with some differences in emphasis and interpretation. Anundsen, et al., who also present the longer-run version of Haavelmo’s model, focus more on endogenously induced fluctuations in the business cycle, whereas the concern here is with deriving some implications for policy use.
environment. In order to bring out the inherent logic of such interaction he often drastically simplifies on the grounds that if after the removal of clutter a core interaction remains this would be fundamental. For example, in the development of macroeconomics it has been widely assumed that sticky prices and wages are required in order to generate under-utilization of resources and unemployment. Haavelmo demonstrates instead that these phenomena can be generated in a neoclassical context of flexible prices insofar as there is no inherent mechanism for immediately eliminating a certain kind of stock imbalance that arises when the marginal product of capital falls below the rental rate required by ultimate owners of capital.\(^9\) It may be true that introducing sticky prices can reproduce the under-employment phenomena, and sticky prices may even be widespread. However, insofar as there is a more fundamental cause, and this is not addressed, a policy of eradicating sticky prices will not be successful in overcoming the unemployment problem that is of concern.

The paper adopts the following plan. The next section describes some essentials of Haavelmo’s basic model. This is followed by a section that introduces some extensions and elaborations to the basic model in order to better relate it to the contemporary situation. The final section uses the resulting model to shed light on the scope for policy solutions to the current predicament.

2. **Haavelmo’s fundamental macroeconomic model: an interpretation**

The model’s inspiration is Wicksellian in that it involves interplay between the banking determined interest rate and the real sector’s natural rate.\(^{10}\) In a major refinement to Wicksell’s original conception, Haavelmo incorporates a theory of capital and liquidity preference, which he uses to develop an endogenous theory of investment.

The actors of the economy are grouped into four categories: firms who produce output and undertake adjustments to their capital stock; households who provide labour, earn

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\(^9\) Both in IT and SMT.

\(^{10}\) An accessible account is Wicksell (1907).
income, save, consume, and are the ultimate owners of the wealth of the economy; the banking sector, which accepts deposits and lends to wealth owners; and finally the public sector, which consumes, invests, levies taxes and borrows. The sum total of their consumption and investment activities determines national output, and the central issue is to explain these activities by reference to both the real and financial sides.

**The real side**

This is a one sector model with output produced, consumed, and accumulated as capital, all at a common price \( P \). In real terms

\[
Y = C + I
\]

(1)\(^{11}\)

\( Y \) is output; \( C \) indicates consumption; and investment is \( I \). The latter two aggregates implicitly include government outlays.

There is an insightful discussion of the determinants of consumption behaviour in SMT, but the model uses the simplest formulation (here I follow the terminology in Anundsen et. al)

\[
C = g(R) + C_g \quad \quad 0 < g'(R) < 1
\]

(2)

\( R \) is households’ net disposable income and \( C_g \) is public consumption. The latter is assumed to be exogenous. Disposable income is defined as

\[
R = Y - \delta K - T
\]

(3)

Here \( \delta \) is a constant rate of capital depreciation and \( T \) denotes taxes from total output.

Three types of investment are distinguished

\[
I = I_1 + I_2 + I_g
\]

(4)

\( I_1 \) refers to firms’ investments to increase the capital stock given the existing technology and is directly related to profitability considerations; \( I_2 \) denotes investment of a more routine and

\(^{11}\) All flow terms refer to a period \( t \), while stock terms and balance sheets refer to a point in time in relation to the period. To save on terminology time referents are suppressed.
autonomous nature that is undertaken to exploit new technologies; and $I_s$ represents investment undertaken by the public sector. The focus in this section will be on the determination of the $I_1$ component, and both $I_2$ and $I_s$ are assumed exogenous.

The technical limits for production in the economy are set by the following production function where $N$ denotes the labour input and $K$ is the given stock of capital.

$$ Y = \phi(N, K) $$

(5)

The production function has standard properties of substitutability, increasing returns and technical complementarities between the two inputs.\(^{12}\)

Haavelmo distinguishes between two types of production situations. Under alternative “A”, firms find demand for output to be adequate, for example as indicated by the behaviour of the inventories that they hold. They are assumed to be perfectly competitive price takers i.e. they are “quantity producers” in Haavelmo’s description, and produce as much as they profitably can in accordance with their profit function

$$ \Pi = PY - r^* PK - \delta PK - wN $$

(6)

Here $r^*$ is the (required) rate of return i.e. the rental rate that owners of capital extract from firms, $w$ is the given wage rate, and $P$ is the given price level.

Since the capital stock is given and a rental $r^*$ is being paid, the firm’s optimal recourse is to hire as much labour as is economically feasible, which increases the marginal product of capital. If labour accepts a wage that is at or below the marginal product of labour, firms will hire the maximum available labour force $H$ and bid and pay a wage equal to the full employment marginal product (see Anundsen et. al. for a slightly different interpretation involving a low reservation wage, but with the same result); otherwise they would employ less labour, but this is a condition enforced by labour.

\[^{12}\frac{\partial \phi}{\partial N} > 0, \frac{\partial \phi}{\partial K} > 0, \frac{\partial^2 \phi}{\partial N^2} < 0, \frac{\partial^2 \phi}{\partial K^2} < 0, \frac{\partial^2 \phi}{\partial K \partial N} > 0\]
\[
\frac{\partial \phi}{\partial N} = \frac{w}{P}, \text{ and } N = H
\] (7)

Applying labour \( H \) to the given capital stock \( K \) yields a net marginal product of capital, \( r \)
\[
\frac{\partial \phi(H,K)}{\partial K} - \delta \equiv r \tag{8}
\]

If \( r \) exceeds the rental rate \( r^* \), firms will be making excess profits for the given capital stock, which are assumed to be returned to the ultimate owners of capital. This situation leads firms and owners of capital to desire more capital stock \( K^* \) for which the net marginal product equals the required rental rate
\[
\frac{\partial \phi(H,K^*)}{\partial K^*} - \delta \equiv r^* \tag{9}
\]

An excess stock demand for capital \((K^*-K) > 0\) will lead to owners attempting to acquire the additional capital from each other, but since the capital stock is given in the aggregate, the result will be merely to drive up the price of capital \( P \), which is also the price of output. However, as Haavelmo demonstrates on bringing in the financial side, dealt with below, there is an alternative way of ensuring a temporary equilibrium without recourse to jumps in \( P \). In the closed economy and in the aggregate, the only way to provide for additional capital stock is through investment. The instantaneous rate of investment in continuous time would have to be infinite to meet a discrete excess stock demand for capital. Since this is not possible and the desired capital stock can only be attained more gradually over time, a mechanism needs to be specified for determining investment flows.\(^{13}\)

\(^{13}\) For example, in the case of a Cobb-Douglas production function, \( K^* \frac{r}{r^*} K \). Thus if \( r \) is 6 percent and \( r^* \) is 3 percent the desired capital stock would be double the current one. If the existing annual capital output ratio is 3, the desired capital output ratio at the existing level of output would be 4. If \( I_1 \) is, say, 10 percent of \( Y \) it would take 20 years to attain the desired capital output ratio. Thus relatively small changes in the gap between the rental rate and the marginal product of capital for the given capital stock and employment could cause big changes in the desired investment flow.
The mechanism that Haavelmo adopts in his basic model, and which also closes the real part of the model, is to postulate that firms accept as investment (i.e. \( I_i \)) any surplus output that is left over after meeting consumption, autonomous investment, and public sector requirements.\(^{14}\) Hence, there is no need for the price level or interest rates, or even wages, to adjust to ensure equilibrium in the output market.

The other situation that Haavelmo considers is a low output alternative “\( B \)”, which arises when the full employment level of the net marginal product of the given capital stock is lower than the required rate i.e. \( r < r^* \). The desired stock of capital is then less than the current one. However, since investment cannot be negative, the reduction in the capital stock to desired levels can only be achieved through natural depreciation. Firms and capital owners would obviously not engage in any \( I_i \) investment, which is a state could that could last for many years and be longer than the alternative capital accumulation phase. Haavelmo characterises this situation as one where firms produce to “orders” i.e. in accordance with their order books so as to avoid risking the piling up of excess inventories.

Since output \( Y \) from producing in accordance with orders is lower than that under alternative \( A \), not all of the available labour willing to work at the given wage would be employed, and a Keynesian under-employment outcome ensues. Haavelmo notes that applying less labour to the given capital stock to produce the now smaller level of output further lowers the net marginal product of capital \( r \) below its full employment level \( r^* \), which prolongs the agony of unemployment.

As an aside it might be noted that with less labour hired for the given stock of capital, the marginal product of labour would be higher than the real wage that prevailed under

\(^{14}\)This procedure rules out a conflict between saving and investment plans, but it is not an essential requirement for his model, and a more complex model could be set up with a separate equilibration mechanism for the flows.
alternative \( A, \frac{\partial \phi}{\partial N} > \frac{w}{P} \). Reducing wages to help increase employment, as is often recommended, would not help, since the maximum level of employment needed is determined by the order book and the given stock of capital and neither of the latter two are affected. Reducing wages would only increase profits of the firm at the expense of labour. However, if there is excess labour available under alternative \( A \) for the given wage, reducing wages would help remove it.\(^{15}\)

**The financial side and its integration with the real side**

The next step is to examine the determinants of the required rental rate, which is done from the financial side. Here Haavelmo focuses on two key balance sheets. The first is a combined one for the household and public sectors, while the second is for the banking sector. In order to convey the essentials Haavelmo suppresses the public sector, and interprets the balance sheet as if it concerned only households, a strategy that we shall also adopt in this section.

**Table 1** Balance Sheet for Non-Banking Sector

<table>
<thead>
<tr>
<th>Assets</th>
<th>Liabilities</th>
</tr>
</thead>
<tbody>
<tr>
<td>( PK )</td>
<td>( L )</td>
</tr>
<tr>
<td>( M )</td>
<td>Net Worth=( W )</td>
</tr>
</tbody>
</table>

Households are the ultimate owners of capital \( K \), the nominal value of which is denoted \( PK \). They hold all the money stock issued. The entry shown in the table comprises

\(^{15}\) It should also be noted that unemployment does not depend on sticky prices and wages, but arises in a classical context. It is simply a consequence of their being less investment and smaller order books because the net marginal product of capital is less than the required rental rate.
the non-interest bearing component, since Haavelmo assumes that any interest bearing money is netted against loans $L$ contracted from the banking sector.

Table 2 presents the balance sheet for the banking sector, which consolidates the central bank with the commercial banks. Its liabilities comprise deposits, which funds the loans that it provides at some interest rate $i$. The sector’s net worth is shown as zero, which is a convenient simplification.  

<table>
<thead>
<tr>
<th>Assets</th>
<th>Liabilities</th>
</tr>
</thead>
<tbody>
<tr>
<td>$L$</td>
<td>$M$</td>
</tr>
<tr>
<td>Net Worth=0</td>
<td></td>
</tr>
</tbody>
</table>

Certain features of the financial sector setup should be noted. The banking sector engages in leveraged lending. Money is created through the issuance of loans, which in principle is the same as an open market operation. The household sector contracts loans to finance capital acquisitions or cash holdings. Since the economy is closed all loan proceeds have to be deposited with the banks (Haavelmo abstracts from the complications of introducing currency). This creates potential for another round of loans, and so on.

Non-interest bearing money in the model is held for its liquidity value. Different goods, even if they have the same nominal value, may face varying difficulties in how readily they may be converted into cash, which is the most liquid asset and therefore desirable for contingency and other reasons. He notes that when liquidity preferences change, transactors can acquire their desired amounts of money but only by adjusting the loans outstanding with the banks. They cannot effect changes in their money holdings by adjusting their holdings of...

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16 However, this could be still be construed as a capital requirement condition. More realistic alternative conditions could be introduced, but the essentials of the argument to be made remain unchanged.

17 The model abstracts from flow injections of money, for example from financing a government budget deficit. Haavelmo (1978) construes such injections as an income statement entry and not a balance sheet one which would bear different consequences for the macro economy.
claims on capital, since this would only involve a redistribution of money balances and capital claims within the sector, leaving the latter two aggregate totals intact.

These notions are formalized by setting up a preference function for the sector (on analogy with that for the individual portfolio owner) regarding the composition of the non-banking sector’s portfolio.\(^\text{18}\) This is maximized with respect to the balance sheet constraint

\[
\text{Max}: \quad U \left( \frac{K}{P}, \frac{M}{P}, \frac{L}{P}, \frac{W}{P}, r^*, i, Y \right)
\]

wrt : \quad W = PK + M - L

The following demand functions for the portfolio items result, which are indicated by* (except for \(r^*\), which is the required rental rate of capital)

\[
K^* = k \left( \frac{W}{P}, r^*, i, Y \right)
\]

\[
\left( \frac{L}{P} \right)^* = l \left( \frac{W}{P}, r^*, i, Y \right)
\]

\[
\left( \frac{M}{P} \right)^* = m \left( \frac{W}{P}, r^*, i, Y \right)
\]

The functions have standard interpretations: thus the demand for capital ownership claims increases with the rental rate that can be charged and declines if borrowing costs rise; demand for loans also increases with the rental rate for capital but declines if borrowing costs rise; and liquidity preference declines with rises in both the rental and borrowing rates, since in both cases the opportunity costs of not investing or paying down debt increase.

Haavelmo then proceeds to consider how optimal portfolio demands for a given constellation of exogenous values i.e. output, the price level, and total nominal wealth, are reconciled with their supplies. The issue is that of the conditions for temporary equilibrium of the financial side. If the requirement that the desired stock of money be equal to the amount

\(^{18}\) Haavelmo, both in IT and SMT was concerned about the aggregation problem. In the end he decided to adopt the procedure of reasoning by analogy as a convenient way of retaining the insights from individual behaviour, while at the same time allowing for macroeconomic interactions between groupings of individuals.
of loans outstanding is met, as specified by the banking sector’s balance constraint, then it follows from the non-banking sector’s balance sheet constraint stated in (10) that the available stock of capital would also be held. Thus only one equilibrium condition needs to be satisfied for the financial side to be in equilibrium

\[ m(K, r^*, i, Y) = l(K, r^*, i, Y) \]  

(14)

The model thus provides that for a given loan interest rate \( i \) specified by the monetary authorities, there is a rental rate \( r^* \) of capital that will ensure that the desired and actual stock of money equals the desired and actual stock of loans. The rental rate on capital is usually higher than the loan rate since the latter represents a contractual requirement whereas the former takes account of the greater risk associated with production and the marginal product of labour. The relationship between the two can be stated conveniently as

\[ r^* = f(i, K, Y) \]  

(15)

Instead of being endogenously determined by preferences, Haavelmo considers the possibility that the money stock is policy constrained, in addition to the loan interest rate. If the initial situation is one of equilibrium and the money stock is now, say, reduced, it is possible to attain the earlier equilibrium level for \( M \) and \( L \) by selling capital and reducing its price. However, this will change the level of real wealth and disturb the initial equilibrium between the desired capital stock and its availability (see equation (11)). Thus a disequilibrium situation is created.

The model indicates that shocks from the financial side such as shifts in liquidity preference and loan interest rate settings by the monetary authorities will impact on the required rental rate, which will directly affect investment and hence production on the real side. Insofar as alternative A prevails, pressure on full employment output will be present. If sustained this would result in inflation, which Haavelmo expresses on Wicksellian lines.
\[
\frac{dP}{dt} = \gamma P (r - r^*)
\]  

(16)

However, he does not specify in his basic model precisely how the inflationary adjustment in prices occurs. As was noted earlier, the model does not require the price level to jump to equilibrate portfolios, while the flow side is characterised by investment passively absorbing the excess supply of output. This suggests that the inflationary impulse would come from labour demanding higher wages and increases in other input costs as the pressure from investment on production is maintained.

3. Haavelmo’s Basic Model – an Extension

Haavelmo developed his model in the 1950s, a period during which financial and other markets were heavily regulated.\(^{19}\) For example, Norway engaged in stringent credit budgeting, which was not fully lifted until the 1980s. This makes his model all the more prescient with regard to the conditions that would operate under free financial markets. Issues of liquidity preference and portfolio balance became more prominent since Wicksell’s time, which Haavelmo incorporated into the Wicksellian framework. In recent years, deregulation of financial markets and transactions, and the rise to prominence of secondary markets for capital claims, has greatly increased speculative behaviour. This poses more acutely problems involving balance sheet shocks, which can constrain spending behaviour, affect the required rental rate, and adversely impact the macro economy. In this section the basic model is extended, while retaining its fundamental orientation, to allow more explicitly for the preceding type phenomena.

**Extending the financial side**

The financial side of the basic model, specified in equations (10) to (14) in the preceding section, determined the rental rate at which capital owners would be comfortable

\(^{19}\) However, his earlier exposure to the freer markets of the US is likely to have been helpful (see Bjerkholt (2007))
with their holdings, given the loan rate of interest, their preferences regarding liquidity and
loans, and given the price level as a state variable. This approach is retained, while a
secondary market involving capital claims is introduced. Capital claim owners may be
comfortable with some rental rate $r^*$, but if they wish to trade their claims they go to a
secondary market, e.g. the stock exchange, and attempt to get the best price. The output cost
of capital remains $P$, but now a valuation is placed on the claim. Let the valuation price be
$V$, which adjusts to clear the market for these claims in the manner specified below.

In Haavelmo’s model the focus is on acquiring capital financed through savings or
borrowing to exploit differences between the equilibrium rate that balances portfolios and the
marginal product of capital. This is arbitrage of a more restrained variety in contrast to
speculative activities directed at quick capital gains, which have become increasingly
prominent and contributed to the contemporary financial crises. Modern finance provides
many techniques for generating speculative gains, based on highly leveraged borrowing, but
our approach here will be to consider the simplest formulation.

The basic model’s portfolio decision problem will need to be modified as follows

\[
\begin{align*}
\text{Max:} & \quad U \left( \frac{VK}{P}, \frac{M}{P}, \frac{L}{P}, \frac{W}{P}, r^*, i, Y, \sigma \right) \\
\text{wrt:} & \quad W = VK + M - L
\end{align*}
\]

(17)

Nominal wealth is now based on the market valuation of the claim and not on the
replacement price $P$. Several factors will influence the valuation of the claim such as future
expectations of its value and its uncertainty. One should also add attendant emotions,
especially those of optimism or pessimism as was emphasised by Keynes (1936). Here, for
simplicity, all these factors are relegated to a shift parameter $\sigma$ in the preference function. An

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20 A simple analogy is with the housing market. Owners of real estate may be quite happy to hold
the stock at a given real rental rate. However, from time to time some may test the market hoping to get a better
price and to realise capital gains. Or they may be constrained for cash flow reasons to sell. The market prices so
established affect the valuation of the entire stock. Even if the real rental rate is constant, when expressed as a
percent of the nominally valued stock the resulting effective rate for comparison with the loan rate could vary
substantially.
increase in its value denotes a move towards more optimistic expectations and the converse for a decrease. On optimizing (17) the following demand functions are generated for real holdings of capital claims, loans and money, respectively

\[
\left( \frac{VK}{P} \right)^* = k \left( \frac{W}{P}, r^*, i, Y, \sigma \right)
\]  

(18)

\[
\left( \frac{L}{P} \right)^* = l \left( \frac{W}{P}, r^*, i, Y, \sigma \right)
\]  

(19)

\[
\left( \frac{M}{P} \right)^* = m \left( \frac{W}{P}, r^*, i, Y, \sigma \right)
\]  

(20)

An increase in \( \sigma \) raises the demand for capital claims, and also for loans to finance the increased demand for capital claims. Correspondingly, there is less of a perceived need for precautionary cash.

An additional market clearance condition is now needed for the determination of \( V \). This is based on (18) on noting that the underlying demand for capital has to equal the given stock at a point in time.

\[
V^* = \frac{k \left( \frac{W}{P}, r^*, i, Y, \sigma \right)}{K} P
\]  

(21)

An increase in the demand for capital claims, say, because of a decline in the loan rate, or greater optimism, increases its equilibrium valuation \( V^* \).

As before, equilibrium with regard to liquidity preference prevails when the desired and actual stock of money equals the desired and actual stock of loans contracted, with the amount of money and loans freely adjustable at the given loan interest rate. It then follows from the balance sheet constraint in (17) that the nominal market value of the capital stock, \( VK \), equals the nominal value of wealth \( W \). Using this and equating (19) and (20) yields

\[
m \left( \frac{V^* K}{P}, r^*, i, Y, \sigma \right) = l \left( \frac{V^* K}{P}, r^*, i, Y, \sigma \right)
\]  

(22)
From (22), and on analogy with (15), the required rental rate can be stated as

\[ r^* = f \left( i, \frac{V^* K}{P}, Y, \sigma \right) \]  

(23)

Note that if the real value of wealth rises, there would be an increase in the demand for loans, but there would also be an increase in desired money holdings. Since these effects are offsetting, the change in the required rental rate would be limited, in which case (23) would be closer to (15). The rental rate is then mainly affected by the loan rate, \( i \), and now \( \sigma \). Since greater optimism will increase the demand for loans, while reducing the need for cash, a lower rental rate is needed to induce holding of the larger stock of cash from the increased loans. This, of course, would be beneficial for the real side of the economy.

The balance sheet for the non-banking sector needs to be modified to allow for the separate valuation of capital. Net worth varies depending on the valuation of capital, but it is always positive in the aggregate for a closed economy. However, shocks could change the distribution of net worths, and raise coordination problems for the economy, which is discussed in the next section.

**Table 1a  Balance Sheet for Non-Banking Sector**

<table>
<thead>
<tr>
<th>Assets</th>
<th>Liabilities</th>
</tr>
</thead>
<tbody>
<tr>
<td>( VK )</td>
<td>( L )</td>
</tr>
<tr>
<td>( M )</td>
<td>Net Worth=( W )</td>
</tr>
</tbody>
</table>

In order to bring out the potentially destabilizing activities of the banking sector, the balance sheet shown in Table 2 will need to be decomposed into separate balance sheets for the banking sector and the central bank, shown respectively as Table 2a and Table 2b. One reason for doing this is to observe the distinction between the central bank interest rate, which
will now be referred to as $i$, and the loan rate charged by the commercial banks, $i^*$. The former could be viewed as a short-term rate, and the latter as a longer-term rate resulting from the maturity transformation function of the financial intermediaries.

### Table 2a  Balance Sheet for Commercial Banks

<table>
<thead>
<tr>
<th>Assets</th>
<th>Liabilities</th>
</tr>
</thead>
<tbody>
<tr>
<td>$(1-\alpha)L$</td>
<td>$M$</td>
</tr>
<tr>
<td>$R$</td>
<td>Net Worth=0</td>
</tr>
</tbody>
</table>

### Table 2b  Balance Sheet for the Central Bank

<table>
<thead>
<tr>
<th>Assets</th>
<th>Liabilities</th>
</tr>
</thead>
<tbody>
<tr>
<td>$\alpha L$</td>
<td>$R$</td>
</tr>
<tr>
<td></td>
<td>Net Worth=0</td>
</tr>
</tbody>
</table>

The banking sector holds part of its assets in the form of reserves $R$ with the central bank. It is assumed here that these are provided by the central bank through discounting loans amounting to a total of $\alpha L$ at a rate of $i$.

The rental rate will now be determined by reference to the loan rate charged by the banks, which in this case could be influenced by the central bank’s discount rate, depending on the internal situation of the bank

$$ r^* = f \left( i^*, \frac{V^* K}{P}, Y, \sigma \right) $$

with $i^* = h(i)$

(24)
**Extending the real side**

On the real side the fiscal sector is made a bit more explicit, and the consumption function is slightly modified. Equation (1) is restated as

\[ Y = C_p + I_p + G \]  

(25)

The subscript \( p \) refers to the private sector, and \( g \) to the public sector. Government expenditure’s components are \( G = C_g + I_g \), while those of private investment are \( I_p = I_1 + I_2 \).

The consumption function retains its simple form in (1) but is now expressed as a linear relation, with the propensity to consume ratio a function of \( \lambda \), the ratio of loans to the value of capital owned, and the mood parameter \( \sigma \). If the loan to value ratio is very high, prudent consumers would save more to reduce it, but if they feel more optimistic they might want to reduce it by less.\(^{21}\)

\[ C_p = c(\lambda, \sigma)(Y - \delta K - T) \]  

(26)

Introducing the tax function \( T = tY \) into (26) yields

\[ C_p = c(\lambda, \sigma)(1 - tY) - c(\lambda, \sigma)\delta K \]  

(27)

The above expressions are incorporated into Haavelmo’s two alternative cases of full employment \((r > r^*)\) and under employment \((r < r^*)\). In the full employment case \( A \), output is given by the production function

\[ Y = c(\lambda, \sigma)((1 - t)Y) - c(\lambda, \sigma)\delta K + I_1 + I_2 + G \]  

(28)

As before \( I_1 \) is residually determined, and the equation implies that any changes in government expenditures, the tax ratio, or the amount of consumption are offset by a

\(^{21}\) In the event their balance sheet situation becomes catastrophic even this simple consumption function may no longer be tenable as households demand a minimal subsistence amount so as to maximise saving. On the other hand, during comfortable times with greater income predictability households are more likely to engage in longer term planning and consume in accordance with the Euler conditions of standard macroeconomics.
corresponding adjustment in \( I_i \). Thus equation (28) deals only with the distribution of the optimal amount of \( Y \).

However, under alternative \( B \) output takes the form

\[
Y = c(\lambda, \sigma)((1-t)Y) - c(\lambda, \sigma)\delta K_i + I_2 + G
\]

(29)

Since output is now variable, as long as it is below the level in (28) a reduced form expression can be derived, with the standard Keynesian multiplier

\[
Y = \alpha\left( I_2 + G - c(\lambda, \sigma)\delta K \right)
\]

\[
\alpha = \frac{1}{1 - c(\lambda, \sigma)(1-t)}
\]

(30)

Output would be affected by fiscal policies or shifts in consumption behaviour.

Insofar as the output level determined by (30) is below that of (28), the given stock of capital is combined with less labour. As before, this implies a lower marginal product of capital \( r \), which will tend to lower the demand for capital stock, with adverse consequences for investment. The fact that the marginal product of labour would be higher than the wage paid would help ensure that some firms at least are making profits, but this is not adequate to stimulate investment on their part as long as the marginal product of capital is lower than the rental rate. Stimulative fiscal policies could increase the marginal product of capital, but can only do so much, and the more enduring solution is to get an appropriate relationship between \( r \) and \( r^* \) by adjusting the latter.

4. Policy inferences and the contemporary predicament

This section uses Haavelmo’s model, and its extension, to view the macroeconomic and financial crises that many countries are experiencing. First, a stylized scenario is set up. This is followed with a discussion of how policy interventions could improve the situation, against a backdrop provided by the recent experience of the G-7 countries.
A scenario

Let us suppose an economy where the environment is optimistic. The required rental rate on capital is $r^*$, which is suitably above the loan rate $i^*$, and well below the marginal product of capital $r$. In accordance with Haavelmo’s model, wealth owners and firms will then wish to expand their capital stock, which in the aggregate can only be undertaken through more investment. Firms act as quantity producers and the economy booms, profits grow, unemployment declines, while inflationary pressures increase. Owners of capital claims although comfortable with the rental rate would like to acquire more such claims. They access the secondary market for claims and bid prices up.

Owners of the existing stock of claims, now feeling richer, are more secure in increasing their borrowing from the financial sector. Some of this may be to finance increased consumption, while some is applied to the acquisition of more capital claims. This will raise the prices of the claims further as would speculative activity directed at obtaining capital gains. As the stock of loans increases, the required flow of interest payments to service it also increases. Over time the proceeds from an unchanged rental rate would be increasingly inadequate to cover the growing loan service requirements. At first, this may not hamper speculative activity especially if it takes the form of flipping over assets whose prices continue to increase thereby generating capital gains which both finances borrowing costs and provides a net profit. However, eventually, the rate of asset price increases slows down. The loan to value ratio increases, especially if more borrowers at the margin are granted loans constituting a higher proportion of asset values. An increasing number of individual borrowers become very highly leveraged in their quest for more elusive capital gains, and at some point several of them become unable to meet their loan service requirements. Asset sales may then be forced, which triggers a more general markdown in asset prices. Individual
balance sheets start to deteriorate. Since relying on rental income alone to cover borrowing costs may prove inadequate further asset sales are needed. This could trigger a downward spiral in asset values, leading eventually to bankruptcy. History provides many examples of such a process, with some recent cases being the dotcom bubble and the housing bubble.

In a by now familiar story that has been often repeated, banks observe that a growing proportion of their loans are non-performing. This increases their costs, while increasingly they find that they have to extend the maturity of loans so as to avoid taking an immediate hit on their capital. The upshot is that they raise lending charges as they attempt to stem the deterioration in their cash flows. The failure of the banks to extinguish non-performing loans compromises their lending capabilities, since loans are not being turned over which would enable fresh lending. Although the focus here is on banks, a similar story can be related for other financial entities. This can have a chain effect with capital owners borrowing from the banks now requiring a higher rental rate, which if it exceeds the net marginal product of capital would reduce investment and thereby force a recession.

As profit margins decline, financial institutions are tempted to engage in more leveraged and risky forms of lending, which create the potential for spectacular crashes. Given the convoluted nature of inter-bank borrowing and lending, all banks would feel the effects of a crash that may have affected one bank initially, and loan write-offs may become widespread. But, unlike with the non-banking sector, the effect of a fall in asset values could result in negative net worths for the whole sector. Quick re-capitalization of the banking sector may be needed in order to preserve vital banking functions both with respect to the payments system and general intermediation.

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22 This has been described as a “Minsky moment” after the author who did much to develop the thesis. See Minsky (1986).
23 A magisterial overview is to be found in Reinhart and Rogoff (2009).
Viewing the G-7 experience

Haavelmo’s conceptual framework is used here to interpret the recent macroeconomic experiences of the G-7 countries, applying a broad brush approach. The data are divided into two periods of 2005-2008, which more or less pre-dated the crisis, and 2009-2011. 

Table 3  
G-7 Countries: Output Gaps and Haavelmo’s Classification  
(In percent)

<table>
<thead>
<tr>
<th></th>
<th>Output Gaps</th>
<th>H</th>
<th>Output Gaps</th>
<th>H</th>
</tr>
</thead>
<tbody>
<tr>
<td>USA</td>
<td>0.8</td>
<td>A</td>
<td>-4.0</td>
<td>B</td>
</tr>
<tr>
<td>Japan</td>
<td>0.9</td>
<td>A</td>
<td>-5.2</td>
<td>B</td>
</tr>
<tr>
<td>Germany</td>
<td>0.3</td>
<td>A</td>
<td>-2.6</td>
<td>B</td>
</tr>
<tr>
<td>France</td>
<td>0.1</td>
<td>A</td>
<td>-3.9</td>
<td>B</td>
</tr>
<tr>
<td>UK</td>
<td>1.8</td>
<td>A</td>
<td>-3.7</td>
<td>B</td>
</tr>
<tr>
<td>Italy</td>
<td>1.1</td>
<td>A</td>
<td>-3.8</td>
<td>B</td>
</tr>
<tr>
<td>Canada</td>
<td>1.6</td>
<td>A</td>
<td>-1.8</td>
<td>B</td>
</tr>
</tbody>
</table>

Source: OECD Economic Outlook Database. H = Haavelmo

24 The averages for 2009-2011 are either based on the latest (WEO September, 2011) revised forecast for 2011, or the latest OECD economic outlook forecasts for 2011.
Table 3 presents data on the output gap. For the first period these gaps were positive, indicating that the actual outputs exceeded potential levels. Hence, this period would correspond to Haavelmo’s alternative A. A small caveat would be that some of the countries were experiencing high rates of unemployment during this period, but this cannot be attributed to deficient demands, given the state of the output gaps. They are more likely the result of structural problems and increasing wage demands. Turning to the second period reveals a consistently different pattern of output falling well below their potential levels. This would be consistent with Haavelmo’s alternative B in which firms produce to order.

Table 4  
G-7 Countries: Investment, Unemployment, and Interest

<table>
<thead>
<tr>
<th></th>
<th>Investment (percent of GDP)</th>
<th>Unemployment (percent ratio)</th>
</tr>
</thead>
<tbody>
<tr>
<td>USA</td>
<td>19.6</td>
<td>15.6</td>
</tr>
<tr>
<td>Japan</td>
<td>23.7</td>
<td>20.8</td>
</tr>
<tr>
<td>Germany</td>
<td>17.8</td>
<td>17.0</td>
</tr>
<tr>
<td>France</td>
<td>21.4</td>
<td>19.5</td>
</tr>
<tr>
<td>UK</td>
<td>17.4</td>
<td>14.6</td>
</tr>
<tr>
<td>Italy</td>
<td>21.4</td>
<td>19.7</td>
</tr>
<tr>
<td>Canada</td>
<td>22.9</td>
<td>21.6</td>
</tr>
</tbody>
</table>

Sources: IMF, World Economic Outlook Database September 2011; OECD Economic Outlook Database.
Table 4 exhibits investment behaviour during these two periods, and they appear consistent with Haavelmo’s hypothesis. Under alternative B investment would be reduced. The averages show that this occurred for all the G-7 countries, although it was least marked for Germany. The decline in investment ratios is consistent with demand induced declining output. Less labour would be needed to produce the output and this is reflected in the unemployment ratios which, with the exception of Germany undergoes a marked deterioration. However, for Germany the unemployment ratio declines significantly.

In searching for causes it is instructive to look at real long-term interest rates on government bonds as a proxy for rental rates, or at any rate the lower limit for these rates. The information presented in Table 5 shows that, with the exception of Italy and Canada, all the others experienced significant declines in nominal long-term rates. The issue of the appropriate choice of price deflator to employ is controversial, but here the simplest solution is adopted, which is to employ the corresponding period deflator i.e. assuming static expectations. This procedure indicates that in contrast to nominal rates, real long-term interest rates rose for all of the countries except Germany and the UK for whom there were significant declines. Insofar as the higher real rental rates confronted lower net marginal products of capital that the output decline will have brought about, the result would be a decline in the desired stock of capital. This would be consistent with the observation of reduced investments. However, in the case of Germany for whom the real rental rate may have fallen it is possible that the demand for capital increased, and that instead of being placed under alternative B in the second period, it should be considered as still operating under alternative A. The case of the UK appears to be anomalous, but could be a result of the broad brush approach adopted here.
Table 5  G-7 Countries: Long Term Interest Rates

<table>
<thead>
<tr>
<th>Country</th>
<th>Long Term Interest (percent)</th>
<th>GDP Deflator (percent change)</th>
<th>Real Long Term Interest (percent)</th>
</tr>
</thead>
<tbody>
<tr>
<td>USA</td>
<td>4.3</td>
<td>3.3</td>
<td>2.9</td>
</tr>
<tr>
<td>Japan</td>
<td>1.6</td>
<td>1.3</td>
<td>-1.1</td>
</tr>
<tr>
<td>Germany</td>
<td>3.8</td>
<td>3.1</td>
<td>1.0</td>
</tr>
<tr>
<td>France</td>
<td>3.9</td>
<td>3.5</td>
<td>2.4</td>
</tr>
<tr>
<td>UK</td>
<td>4.6</td>
<td>3.7</td>
<td>2.8</td>
</tr>
<tr>
<td>Italy</td>
<td>4.2</td>
<td>4.4</td>
<td>2.3</td>
</tr>
<tr>
<td>Canada</td>
<td>4.0</td>
<td>4.3</td>
<td>3.3</td>
</tr>
</tbody>
</table>

Real long term interest is calculated as the difference between the nominal rate and GDP deflator rate of change.

Sources: IMF, World Economic Outlook Database September 2011; OECD Economic Outlook Database.

A contributory factor for the decline in output could also be consumption behaviour. Cash flow problems, adverse balance sheets, and a general loss of confidence, could force an increase in saving. Table 6 shows that the private sector net saving balance improved for the whole sample and especially for the US and UK, which were also the two countries that experienced the biggest increase in unemployment rates. However, in the case of Germany the improvement was limited, indicating only a slight retrenchment in consumption. Hence, with investment levels more or less maintained, German unemployment levels would be less adversely impacted as was observed.
Table 6  G-7 Countries: Key Macroeconomic Balances

<table>
<thead>
<tr>
<th></th>
<th></th>
<th></th>
<th></th>
<th></th>
<th></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>USA</td>
<td>-1.7</td>
<td>7.5</td>
<td>-3.7</td>
<td>-10.7</td>
<td>-5.4</td>
<td>-3.2</td>
</tr>
<tr>
<td>Japan</td>
<td>7.1</td>
<td>11.6</td>
<td>-3.2</td>
<td>-8.6</td>
<td>3.9</td>
<td>3.0</td>
</tr>
<tr>
<td>Germany</td>
<td>7.3</td>
<td>8.4</td>
<td>-1.1</td>
<td>-2.8</td>
<td>6.2</td>
<td>5.6</td>
</tr>
<tr>
<td>France</td>
<td>1.8</td>
<td>4.4</td>
<td>-2.8</td>
<td>-6.7</td>
<td>-1.0</td>
<td>-2.3</td>
</tr>
<tr>
<td>UK</td>
<td>0.8</td>
<td>8.1</td>
<td>-3.4</td>
<td>-10.0</td>
<td>-2.6</td>
<td>-1.9</td>
</tr>
<tr>
<td>Italy</td>
<td>0.6</td>
<td>1.4</td>
<td>-3.0</td>
<td>-4.6</td>
<td>-2.4</td>
<td>-3.2</td>
</tr>
<tr>
<td>Canada</td>
<td>0.0</td>
<td>2.5</td>
<td>1.1</td>
<td>-5.3</td>
<td>1.1</td>
<td>-2.8</td>
</tr>
</tbody>
</table>

(S-I) is private net savings, (T-G) is the general government fiscal deficit, and (X-IM) is the current account of the balance of payments.

Source: OECD Economic Outlook Database.

Table 7 presents equity market indices as a proxy for the capital valuation term $V$ in the extended model. The impact of the financial crisis and forced asset sales is reflected in the declines over the period 2007 to end-2010, despite some recovery in stock prices in the latter half of the period. This would imply that on balance real net worths are still below the peak levels recorded during the first period. This finding would be reinforced if account were also taken of developments in real estate prices, which in some of the countries such as the US experienced a pronounced decline with no recovery as yet in sight.
Table 7  
**G-7 Countries: Equity Market Indices**  
(Percent change)

<table>
<thead>
<tr>
<th></th>
<th>End-2007 (percent change from 2004)</th>
<th>End-2010 (percent change from 2007)</th>
</tr>
</thead>
<tbody>
<tr>
<td>USA</td>
<td>33.1</td>
<td>-13.7</td>
</tr>
<tr>
<td>Japan</td>
<td>47.5</td>
<td>-17.7</td>
</tr>
<tr>
<td>Germany</td>
<td>87.2</td>
<td>-32.1</td>
</tr>
<tr>
<td>France</td>
<td>90.6</td>
<td>-34.4</td>
</tr>
<tr>
<td>UK</td>
<td>42.4</td>
<td>-28.6</td>
</tr>
<tr>
<td>Italy</td>
<td>44.1</td>
<td>-51.6</td>
</tr>
<tr>
<td>Canada</td>
<td>72.7</td>
<td>-3.6</td>
</tr>
</tbody>
</table>

*Source: IMF Global Financial Stability Report*

It is of interest to examine the measures taken to stabilize the situation. Table 8 indicates the recourse to the two major sets of measures that were undertaken, involving central bank determined interest rates (QE should also be noted) and fiscal policy. The recourse to an expansionary fiscal policy has been quite remarkable with most countries especially the US and UK showing very large increases in their structural budget deficits. Nonetheless, for the latter, despite increases of 4 to 5 percentage points of potential output which matches the investment fall, output declined. The explanation rests with the consumption behaviour of households and their manifest concern to repair badly damaged balance sheets. For Germany, the structural budget deficit increase was much more restrained, but also matched the decline in investment. However, it would seem that their households were less exposed to the damaging balance sheet problems of some of the others, and consumption levels were better maintained.
Table 8  
G-7 Countries: Stabilization Instruments

<table>
<thead>
<tr>
<th></th>
<th>Short Term Interest (percent)</th>
<th>Structural Budget Balance (percent of potential GDP)</th>
</tr>
</thead>
<tbody>
<tr>
<td>USA</td>
<td>4.3</td>
<td>0.8</td>
</tr>
<tr>
<td>Japan</td>
<td>0.4</td>
<td>0.3</td>
</tr>
<tr>
<td>Germany</td>
<td>3.5</td>
<td>1.1</td>
</tr>
<tr>
<td>France</td>
<td>3.5</td>
<td>1.1</td>
</tr>
<tr>
<td>UK</td>
<td>5.2</td>
<td>0.9</td>
</tr>
<tr>
<td>Italy</td>
<td>3.5</td>
<td>1.1</td>
</tr>
<tr>
<td>Canada</td>
<td>3.8</td>
<td>1.1</td>
</tr>
</tbody>
</table>

Sources: IMF, World Economic Outlook Database September 2011; OECD Economic Outlook Database

Table 8 indicates that central banks pursued an aggressive policy of reducing the short-term interest rates that they control. However, it would seem, from viewing the longer-term rates in Table 5 that they may not have been successful in sufficiently reducing required rental rates for capital. There could be several reasons for this lack of transmission, but an important one is likely to be the needs of the intermediaries for improving their cash flows and, hence, not passing on the reductions. The effect of the policies on turning around the crisis appears limited so far.
What policy interventions?

A persistent state of high unemployment, low or negative growth, and financial impairment are clearly unacceptable. But what are the policy options that would help ameliorate these conditions? One approach, which hard-core neoclassical economists such as those of the Real Business Cycle (RBC) persuasion would counsel would be to do nothing, and wait for the economy to right itself. They may have a point if the policy interventions that are applied make the situation worse, and there is little doubt that certain of the policy interventions advocated have this character.

For example, one could apply the traditional Keynesian remedy of an expansionary fiscal policy. This policy involves boosting private sector incomes in the hope of jump starting their spending. It is best applied on a temporary basis when pump-priming is all that is needed. However, as observed earlier in the case of the G-7 economies, the application of a stimulative fiscal policy on a longer-term basis may not succeed in boosting private sector expenditures if they have serious balance-sheet problems that they are trying to address. It is likely that persisting with an expansionary fiscal policy over an extended period adds to anxieties and entrenches uncertainty, especially through large increases in public debt that are inevitable. The public sector would eventually face a balance sheet crisis, with sovereign debt markdowns and serious cash flow problems of its own. In its attempts at coping with these problems, which would require that fiscal deficits be contained, it could make the situation worse. Fiscal retrenchment also raises serious political economy issues such as those of burden sharing, which will need to be properly and imaginatively handled, if confidence, both on the part of entrepreneurs and consumers is not to be further eroded. A government that seeks excessively bureaucratic solutions, especially in areas such as taxation and regulatory control, is likely to only prolong the downturn. RBC adherents could then be proven right that the intervention only made the situation worse.
Another policy, much espoused by the “new neo classical” DSGE movement, is to rely on the monetary instrument of interest rates, either alone or increasingly in tandem with an expansionary fiscal policy which it finances. As was noted in connection with the G-7 countries there has been a dramatic reduction in short-term interest rates, but this too, even when combined with more stimulative fiscal policies, has not turned the situation around. Very low short-term interest rates have helped financial institutions with access to cheap funding to boost stock exchange values. However, they have not addressed immediate balance sheet problems, and banks have had to be recapitalized, usually at considerable fiscal cost. Low interest rates have helped the banking sector cope with their cash flow problems, but this has not contributed to a lowering in the loan rates applicable to borrowings for the purpose of accumulating capital. As was noted earlier, for the most part 10 year government bond yields remain high, and corresponding corporate bond yields are even higher.

Some have concluded that the present crisis indicates severe structural problems and there is some validity to this view. However, the argument that overcoming it will require massive bail outs of firms important for the overall economy needs is controversial. A distinction needs to be drawn between a banking sector that suffers a collective increase in non–performing loans and has its capital wiped out, and the non-banking sector that experiences an adverse shock to its balance sheets. Collectively, as was noted earlier, the non-banking sector will continue to have a positive net worth, even if it is reduced. However, the distribution of net worths could change, and some firms may become bankrupt, while others remain in a strong position. For the sector as a whole, unlike with the banking sector, the problems concern more the impairment of their cash flows as a consequence of having to service higher debt levels with dwindling income. While stimulating the economy will help with this problem, this is a temporary fix, and a more enduring solution is needed. This would not have been needed if those who gained, or suffered less of a hit on their net worths, were
to acquire the bankrupt firms, at any rate those that are salvageable. Encouraging forced mergers and acquisitions as part of “creative destruction” is more likely to restore the sector to earlier health, remove the deadwood off the books of the banks, and impart confidence to those who survive. Risk taking is inherent to capitalism but if this is to be preserved those who took risk, and failed, have to pay the price, otherwise moral hazard results.

In the case of the banks, given their central intermediation role, they will need to be made functional again, otherwise capital accumulation would suffer and the crisis prolonged. Re-capitalization will be needed but its effects should not to be dissipated by banks who are so concerned with their balance sheets and with generating a positive cash flow that they refrain from lending. A solution here would be to set up “bad” banks on to whom the non-performing loans are pushed, while “good” banks retain the better quality loans and are re-capitalized. With clean books, the “good” banks would feel encouraged to lend.

Taking appropriate structural measures to ensure the soundness of the banks and of the non-banking sector would go a long way towards ensuring the appropriate spreads between the marginal product of capital, the required rental rate, and the loan rates. With the gradual restoration of confidence in a context of easy monetary policy and stimulative fiscal policies, more capital stock will be demanded of obvious benefit to investment. All this would be in the spirit of Haavelmo (1987), who counselled that destabilizing crises could be avoided if the banking system engaged in prudent lending. He regarded the key role of the central bank as that of restraining excessive lending both to and by the banks. He was especially critical of frequent changes in central bank determined interest rates and fine-tuning attempts.

5. Conclusion

Haavelmo was profoundly interested in macroeconomics which he viewed very broadly as the study of the economics of a society that caters to the well being of its people.
As he put it, ‘Society’ is of critical importance for without it “we would probably all be dead in a few weeks” (Nobel lecture, 1990). By society he meant an arrangement of rules and regulations that governs interactions between individual entities, with the distinctive characteristic that the rules are manmade, and are subject to an inherent dynamic: they change when people are dissatisfied with perceived outcomes (either because preferences have changed or outcomes have deviated from intended ones or because they sense scope for improvement) and use their influence in the political arrangements to modify them. This is an incessant activity which generates feedback effects on the economic system. Therefore, he argued, one has to be very careful when theorizing about macroeconomics, since its relationships are not immutable. But the latter could be used to advantage, since it presents opportunities for modification so as to better achieve societal goals.

Haavelmo claimed that an adequate macroeconomic theory is one that realistically describes and simulates an economic society that would be feasible under some economic policy. Econometrics is needed to help quantify the magnitude and net effect of forces that generate a set of economic observations but it can only function properly if the underlying economic theory is adequate. He lamented the limited progress of macroeconomic theory and worked to improve it. While emphasising the importance of models for organized thinking and improved analysis, and the desirability for axiomitization as an aid to rigorous analysis, he cautioned against premature axiomitization. In particular, he was concerned that the micro-foundations of neoclassical theory implied a macro economy that bore little resemblance to the real world. Instead he wondered if it might not be better to start with a realistic conception of the macro economy and ask what sort of micro-foundations would support it. Achieving the latter would then provide the basis for an appropriate axiomitization.
His overriding quest was that of seeking good or better explanations of economic phenomena that would help support realistic interventions and improve economic outcomes. Haavelmo was concerned with fashions in macro theorizing and the tendency to accept uncritically whatever happens to be the dominant theory. As he put it (p. 14 of SMT, my translation) “....the best models of the day will be viewed as a hopeless joke in the not too distant future. Every author will obviously try as hard as he can to give the reader the impression that his conceptual apparatus and analysis is the best possible, which applies also to the present author ...However, these remarks are not the author’s attempt to show appropriate modesty but an urgent appeal to students to quickly contribute to making existing models obsolete.”

His exhortation applies to the models set out here.

References


