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April 9, 1971

**Study Group: Financial Interrelations
In The American Economy**

Memo # 2

Notes on User Cost

H. P. Minsky

- 1) The basic problem is: If at a given wage and price level excess supply, in some meaningful sense, exists for labor, commodities and capital services why does this not result in price and wage changes so that equilibrium at which $S = D$ results? Various answers to this question are possible. I believe Keynes and the Keynesians have given a number of different answers.
- 2) The meaningful sense qualifying phrase is important for, as will be argued, some of the excess supply as measured centers around reservation prices. However the reservation price is not due to the phenomena that yields elasticity to say the supply curve of labor at a moment of time. The reservation price that determines effective supply is computed by referring to prices that are expected to rule in the future, where the current price differs from expected price because of system performance. Thus at some expected future date the ruling price is expected to be such that a minimum exists to the acceptable current price. This reservation price phenomena is especially relevant to capital services--where intertemporal substitution is possible. It may effect labor services to the extent that labor believes that the embodiment of labor services in products will be around to spoil labor markets in the future and labor is cohesive enough and in part affluent enough to act on the basis of such beliefs.⁽¹⁾
- 3) Keynes as a good Marshallian broke up a dynamical process into a sequence of market developments and interactions among markets. In Marshallian terminology market period, short run, long run and secular equilibrium were identified. In the Keynesian underemployment equilibrium portfolios are in equilibrium, there exists an excess supply of labor and the capital stock is capable of yielding a greater flow of capital services on a sustainable basis than it is actually doing. In addition flow demand and supply of commodities

are equal even though there exists a notional excess supply of commodities (excess capacity). Furthermore, net investment may be positive, negative, or zero.

4) In terms of price pressures from within the various markets, in Keynesian underemployment equilibrium there are no price pressures in the financial markets and there may be price pressures in the labor market. Commodity market price pressures will depend upon developments in the labor market. Whether or not price pressures exist in the market for capital services depends upon the balance between expectations and net investment. These differential pressures in the various markets means that Keynesian underemployment equilibrium can be tied into the Marshallian terminology. That is in Keynesian underemployment equilibrium market period equilibrium rules in the financial, labor, and commodity markets but these equilibrium price and quantity combinations are not the same as those which yield short run equilibrium in labor and commodity markets. Because investment is going on the capital services market may be in market equilibrium and in longer run disequilibrium.

5) In addition to the within the market simultaneous equilibrium - disequilibrium situations, the reaction in any one set of markets feeds into other markets. Thus the capital services market behavior affects ^{investment} output and thus the price movements in labor markets affects commodity supplies. (2)

6) The Keynesian disequilibrium - equilibrium can be identified as a specification of the differential speeds of movement of prices in the different markets. Market processes are such that financial market prices move more rapidly than labor and commodity prices and that, because of triggering and production gestation periods for investment, capital stock movements are slowest of all those being considered (Secular equilibrium in Marshall considered even more time consuming processes - those involving generational

changes). An assumption that is common is that the labor market behaves so that money wage rates are slow to move. Hence in the market period wages can be taken as given, although in the longer run they are variable. As commodity supply prices in the aggregate are a mark up on labor costs, the supply schedule for commodities shifts downward but slowly where excess supply of labor exists. Production adjusts to a short run equilibrium so that commodity production equals commodity demand but the notional excess supply of commodities has no direct impact on commodity prices.

7) Two points are worth noting in this construct.

a. If the interest rate variable in this standard presentation is a proxy for the market price of financial assets then the relative prices of financial assets and current output change. If capital goods are viewed as just another financial asset, then the relative price of capital goods and current production changes. One part of current output is the production of investment goods which yield services that are substitutes for the services that existing investment goods yield.

b. Labor services not used today are not available tomorrow. It seems strange - if one abstracts from the social processes involved and treats labor as if it were just another commodity - that the price for such a non-storeable commodity would be sluggish when excess supply exists. Once normal social processes are ruled out the observed phenomena of wage sluggishness is imputed to an exogenous intervention, be it minimum wages or trade unions.

This 'wage rigidity' argument is the way in which Patinkin, Modigliani and other neo-classicists reconcile a belief in active Keynesian policy and a theory that yields equilibrium only at full employment. It reduces Keynes to a rather banal assertion about elasticity of labor supply and attenuates any recognition that a fundamentally different vision may underlay Keynesian economics.

- 8) Another thread in the Keynesian arguments recognizes that the dynamical processes starting from an excess supply in the labor and commodity markets feeds back into the demand for labor and commodities. Workers make bargains in terms of money wages: money wage rates are both a determinant of the supply curve of commodities and of the budget constraint for workers purchases. That is a fall of wages and the accompanying fall in commodity prices will be associated with a shift of the aggregate demand curve.

- 9) In the Keynesian case aggregate demand is homogenous of degree zero in wages and prices excepting as changing wages and prices affect the real quantity of money and hence the interest rate. (This relation between money, prices and wage levels is sometimes called the Keynes effect). Note that in this view of the economic process, in order to affect real aggregate demand labor, consumption or investment (or government) demand must be affected. If the interest rate is taken as a proxy for the conditions ruling for the financing of that spending which is not financed by proximate income receipts, then an increase in the real money supply whether by price level changes or by open market operations can only affect consumption or investment as it affects interest rates.

- 10) Hence, two slips between the monetary cup and the employment lip can be identified, the first is if the interest rate does not react to a change in the money supply, the second is if consumption or investment demand do not react to a change in the financing conditions. The first is the liquidity trap, and whether or not it exists is one key to the effectiveness of monetary policy. The second is more subtle. Consumption and investment demand are differentiated by the method used for financing. Consumption demand is financed by income received, investment demand is financed either externally or by utilizing excess cash in portfolios. If investment demand is financed

externally, then the investing unit is undertaking some dated or contingent commitment to make cash payments in the future, this cash to be obtained as "rents" for the capital services. If investment demand is financed internally from "excess cash" then the market value of the rents to be earned must be compared with the speculative gains available from holding cash. With both internal and external financing, if the excess cash or the improvement in financing terms are the result of price deflation, then extrapolative expectations would indicate that a real gain is available from holding cash and that the expected ^{nominal} rents to be earned from real capital will decline. Alternatively if the improvement in financing terms or in the availability of internal cash is the result of open market operations, then extrapolative expectations would indicate that there is no gain to be made from holding cash and that the ^{rentals} from real capital will not be trending downward. That is the repercussions of an increase in real money are not independent of how this increase is brought about. The endogenous process operating through price deflation is less reliable as an expansionary technique than the exogenous process operating through money creation (4)

10') This second view emphasizes the financing of spending and the endogenous nature of both the money supply (real) and velocity. It marks a break with neo-classical theory in that investment does not "automatically" fill the gap between productive capacity and consumption. The development of this thread of Keynesian thought does lead to the interpretation of Keynesian economics as the economics of a "financial" economy.

11) A third and perhaps more subtle explanation of Keynesian underemployment equilibrium as a sticky state rests upon Keynes' notion of user cost. Whereas labor services not used today are lost forever, capital services

not used today may be available for use in the future. This is the doctrine of use depreciation and it serves to set a floor, albeit a conditional floor, to the supply price of output.

- 12) Consider the supply price of output. Assuming competitive markets for an industry, the standard text book supply curve is the sum of individual plant supplies as given by the marginal cost curves to the right of the minimum of some average variable cost. There is an ambiguity to the supply curve for it may be necessary to include an allowance for the use depreciation of the capital equipment used in production.
- 13) For the economy as a whole the inputs matrix washes out. Marginal costs for output as a whole equals the incremental wage cost plus the value of capital consumed in production.
- 14) What is the value of capital consumed in production? It is not any measure derived from the historic costs of capital goods. If the services of a capital good are not used today they may, to a greater or lesser extent, be used tomorrow. A ton of coal not burned today can be burned tomorrow - a machine standing idle does not wear out to the same extent as a machine being used. Thus intertemporal substitution in using capital good services is assumed to be technically feasible. Recall that no such technical feasibility exists for labor services.
- 15) If the capital services are used today, there is some rent, Q_t , that can be earned. If some of the available capital services are not used today, then at some dates in the future the available capital services will be greater than they otherwise would have been. These will earn some rents, say the maximum expected rents from such intertemporal substitution is Q_{t+n} .

The minimum acceptable current rental value per unit of capital services is the discounted value of the Q_{t+n}, \hat{Q}_t .

- 16) The above derivation of this minimal acceptable rental value abstracts from the impact of uncertainty and from pressures imposed upon a firm by its liability structure. With these limitations, the supply price of output is the sum of the labor costs and a mark up, where the mark up summed over the expected output will yield a large enough rent to compensate for the user cost.
- 17) In deriving the minimum acceptable mark up on labor costs, allowance must be made for the extra maintenance of the capital series embodied in the capital good over the interval between the present and the date at which the capital is expected to be scrapped. If scrapping occurs from use rather than being due to time and obsolescence, this allowance is positive. If time dominates then the entire problem of user costs may not arise, capital services in fact cannot be reserved.
- 18) If $w(o)$ is the total labor costs as a function of output, $w(o)/o$ is the average cost and dw/do is the marginal cost for a given collection of capital services embodied in a plant. \hat{Q}_t is the minimum rental. The minimum supply price /assuming competitive markets is

$$p_s o = w(o) + \hat{Q}_t.$$

That is

$$p = \frac{w(o)}{o} + \frac{\hat{Q}_t}{o}.$$

- 20) If we assume that over the range consumed $w(o)/o$ is first horizontal and then rising, there will be a required minimum mark up of market price

over average wage costs if the capital equipment is to be used. The above assumes a technology in which the plant use decision is an all or none decision i.e. the rental value is imputed to the services of a plant and the plant is either used or idle.

- 21) Alternatively the rate at which the capital services are used may be a function (linear, homogeneous) of output and for each unit of capital services there exists a present value of the expected future rental \hat{Q}_t . In this case the supply price of capital services is a function of the rate of output. If we assume a recent past in which there was no redundancy of capital equipment, then we can assume a well nigh horizontal portion to the supply of capital services function as well as a positively sloped portion. The positive slope reflects that at more rapid use rates, the period over which present use involves future sacrifice grows shorter.
- 22) From either the all or none plant, construct the more flexible supply schedule of capital services, the idea emerges that the supply price is a mark up on labor costs, that the mark up may be inversely related to the expected output from a given plant and that this mark-up schedule depends upon expectations as to future rents. Note that the foregone rents are in money terms: the price level expected to rule at the date the discounted rent is to be earned ^(affects) determines/the size of the rent.
- 23) When the system is functioning normally, the present value of current rents is greater than the present value of expected future rents so that user cost does not set the price at which capital services are employed. It is when aggregate demand is insufficient that capital services will be held off of the market if they cannot earn a present rent equal to or greater than the present value of some anticipated rent. A decline in de-

mand may initially lead to a decline in rents with no appreciable decline in output: prices and rents fall, wages and output remain essentially unchanged. However once rents fall sufficiently far, user costs sets a floor to the supply price of output. At this stage employment of labor and capital services decline.

- 24) Excess supply of labor can induce a fall in wages. Consider what happens to the components of p_g as wages fall. The labor cost factor $w(o)/o$ falls but as long as the expected Q_{t+n} is unaffected by the current wage decline the user cost factor \hat{Q}_t/o either is unaffected or increases. It may increase for either of two reasons: the costs of maintaining the productivity of the capital stock intact until needed will decrease with the wage costs and the interest rate used to discount the future rents will decline as the real quantity of money increases with the price-wage decline. That is

$$p_g - w(o)/o = \hat{Q}_t/o$$

will rise as wages fall.

- 25) If output or employment were unchanged, a rise in the mark up would shift the distribution of real income toward capital. However the wage bill falling implies that workers demand falls. As output falls the date in the future at which current excess supply of capital service will no longer be redundant recedes in time. This will lead to a decline in user cost. However as long as the price expectations remain unchanged the decline in user costs will tend to be small compared to the decline in output and price. Price flexibility seems to imply that distribution behaves perversely as wages fall and that this perverse behavior of distributive shares (i.e. capital share increasing as income falls if price flexibility rules

and if the supply of capital services is determined by user costs) tends to accentuate the decline in real output and employment.

26) Assume that excess supply of capital services decreases as capital is used when user costs are the effective determinant of the supply price of capital services. As the excess supply is absorbed, user costs rises, for the time to the elimination of the excess supply and thus the number of periods of compounding of the discount factors decreases. The rise in user costs also means that the realized rents rise. Once the redundancy disappears then presumably the rental rates being earned by capital services increases sufficiently so that new investment is drawn forth. The value of quasi-rents and of user cost are a determinant of the pace of investment. Current and expected rents have to be sufficiently large relative to production costs of the capital equipment for investment to take place.

27) The doctrine of quasi-rents and user costs indicates the dual nature of price - as a rationing device for fixed services and as a determinant of the way currently allocatable resources are to be allocated. As long as quasi-rents are greater than user costs supply of capital services is inelastic and capital is a rent yielding asset. Once the reservation price of a determined by user cost is reached the supply curve of capital services becomes elastic. User costs are an inter-temporal rationing device. There also exists a minimum quasi-rent that is sufficiently large, given production costs, to induce the production of the service yielding asset. Rental values have two attributes--that which is being earned as a residual from current production and the minimum that has to be earned if resources are to be allocated to the production of particular capital goods. In the smooth growth world of neo-classical capital theory, they are the same. In the uncertain cyclical world of experience the two aspects of rent are different and in

particular there is an element of choice or decision on what level of earned rents or expected rents are sufficient to draw forth capital investment. This is so for each investment decision involves a conjecture as to the cyclical course of the economy over the production horizon of the produced capital equipment.

- 28) As a final note it is worth noting that there is another aspect to the quasi-rent and the user costs--they are cash flows. The financing of command over durable capital equipment involves a liability structure. This liability structure commits the capital owning unit to cash flows: dated, contingent -- and contractual. Assuming that a sufficiently large penalty for not fulfilling such commitments exists, then the cash flow needs due to liability structure may dominate the reservation price of user costs. That is, a larger output will be produced and a lower mark up will be accepted in an effort to acquire cash to meet liability commitments.
- 29) If cash flow leads to such a use of capital services, then a lower current rent is substituted for a higher present value in determining the capital value of an asset or a set of assets collected in a plant. The end result is a decline in present value--the solvency of the organization is compromised to fulfill liquidity considerations.
- 30) This last remark means that a problem familiar to banking theory--the dichotomy, in particular situations between liquidity and solvency - is as relevant for the determination of optimum liability structure of a corporation as it is for the determination of bank portfolios.
- 31) Of the three identified reasons for underemployment equilibrium--the sluggishness of wage movements, the inefficiency of price deflation to affect the amount of investment financed and the doctrine of user costs--it seems

as if the doctrine of user costs is perhaps the most subtle for it leads to a view of the investment process that seems meaningful to a capitalist economy. However the doctrine of user costs makes sense only if the economic process is envisaged as being cyclical. But if the process is cyclical then underemployment equilibrium is a transitory state. This final remark is paradoxical only if the Marshallian formulation of Keynesian economics is ignored.