

June 4, 2004

**On the shopping-time model, p. 5-6 in slides of Feb. 18**

**Q** When is one in a situation where leisure and consumption are substitutes or complements, and what is most realistic? E.g., on p. 6 (second bullet item) you state that higher  $m$  leads to more work, while you in the next line states the opposite.

**A** First of all, the purpose of shopping-time models is to provide some foundation for putting money into the utility function. (We see that with only consumption and leisure in the utility function we get money indirectly into the utility function through the introduction of a transaction technology.) But in the basic MIU model, the effects of inflation on the real economy depends on the cross derivative  $u_{cm}$ . That is one, which a priori is difficult to sign: if money provides utility because it facilitates transactions, will more money make you enjoy one unit extra consumption more or less? That is difficult to say, as the increase in transaction efficiency provided by higher  $m$  must have something to do with saved time, and thus higher leisure. That is why the shopping-time model introduces leisure explicitly so as to help one sign the “ $u_{cm}$ ” that will implicitly result.

What pages 5 and 6 state is that with a shopping time model, the labor supply effect of more money will essentially depend on the sign of  $v_{cl}$ ; i.e., whether the cross derivative of consumption and leisure are positive or negative. E.g., if  $v_{cl} > 0$  more money will tend to increase work: More money makes you able to buy the same amount of goods in less time so you get more leisure. If that increases your marginal utility of consumption you want more consumption and you decide to work more. What is stated in the second bullet item on p. 6 is that unless  $v_{cl} \ll 0$  then more money will lead to more work effort. The next line thereafter that higher money *growth* (which *reduces* money holdings in steady state) reduces work effort (consistent with the empirically plausible parameterization in Walsh).

What is then most realistic concerning  $v_{cl}$ ? There is no definite answer to that. One could argue for a positive sign by saying that with more leisure you have extra time to enjoy more consumption. On the other hand, you could argue that with more leisure you enjoy that so much in itself that you are better off giving up an extra unit of consumption to obtain even more leisure. Note, in any case, that the positive labour effect of higher money also applies for separable utility,  $v_{cl} = 0$  (as in the specific functional form used by Walsh in Chapter 3). The point is that  $v_{cl}$  should not become too negative.