Comment on Menzio’s “Stubborn Beliefs in Search Equilibrium”
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1. Introduction
At a general level this paper is an exploration of the effect of departures from rational expectations in frictional models of the labor market. More specifically, it studies a handful of examples in which some (or all) workers are assumed to exhibit a very specific form of irrational expectations that Menzio labels as stubborn beliefs.

As one would expect with this author, the modeling features a high level of artistry and craftsmanship, the analysis is clear and elegant, and all of the results are accompanied with strong intuition. The examples illustrate that these departures from rational expectations can have interesting effects on aggregate labor market outcomes, and some of the results are quite provocative. In particular, he shows in one of his examples that a small subset of workers with stubborn beliefs can make labor market outcomes more volatile for all workers in the labor market. That is, workers with incorrect perceptions are not just hurting themselves, they are hurting all workers. The paper also offers a methodological contribution in showing how to formulate equilibrium in frictional models with strategic wage setting and irrational beliefs.

There are two key components to the exercises carried out in the paper. One component is the specification of the departure from rational expectations. The second component is the mechanism through which the specific departure from rational expectations is propagated into aggregate labor market outcomes. In what follows I will discuss each of these in turn.

2. The Departure from Rational Expectations
Menzio studies a model in which there are aggregate shocks to productivity. In a rational expectations equilibrium, all agents in the economy know the stochastic process for aggregate productivity and the mapping from aggregate productivity to the endogenous variables that they take parametrically. Menzio considers a departure from rational expectations in which some or all workers believe that there are no aggregate shocks to the economy, with aggregate productivity always equal to its mean value. These workers solve for the equilibrium that would result if there were no shocks and use it to forecast the values that they take parametrically. This specification amounts to these workers essentially using past long run average values in the economy to forecast future values. Because these workers do not adjust their beliefs about the existence of aggregate shocks, Menzio refers to them as having “stubborn beliefs”.

One of the issues with considering departures from rational expectations, or rational behavior more broadly, is that there are just so many ways to depart from rationality. This remains true even when one restricts attention to departures that one might label as empirically or intuitively plausible. Moreover, as I describe later in the context of one example, I think it is often the case that one can find two equally plausible departures that give opposite results. For this reason, any analysis that focuses on one specific departure will be most compelling if it offers strong evidence to support the specific departure being considered.
Menzio appeals to the recent interesting paper by Mueller et al (2021) to support his assumption about stubborn beliefs. This paper analyzes evidence from the Survey of Consumer Expectations administered by the Federal Reserve Bank of New York to assess the properties of workers’ perceived job finding rates. It documents several facts. First, there is significant heterogeneity in both perceived and actual job finding rates. Second, perceived and actual job finding rates are highly positively correlated. Third, there is little bias in average perceived rates for individuals that are beginning unemployment spells. Fourth, perceived rates seem to “under-react” to actual rates, in that individuals with high (low) actual job finding rates tend to be overly pessimistic (optimistic). Fifth, perceived job finding rates do not adjust over the course of an unemployment spell.

Menzio interprets these findings as supporting his assumption of stubborn beliefs, but my reading of the evidence in Mueller et al (2021) is much less conclusive on this point. The fact that average perceived rates for individuals at the beginning of a spell are roughly equal to average observed job finding rates seems inconsistent with the Menzio’s specification of stubborn beliefs. In his model these two values are equal when averaged across all business cycles, or at a point in time if the economy is in its steady state position. But neither of these conditions hold in the data analyzed by Mueller and coauthors.

The finding that perceived job finding rates do not change over an unemployment spell might be interpreted as some sort of inertia or stubbornness in beliefs, but is not really informative about Menzio’s notion of stubborn beliefs. What is key for Menzio’s exercise is how expectations of job finding probabilities vary over the business cycle in response to aggregate shocks. Ideally, one would want to see what happens to the distribution of perceived rates over the business cycle, but an important limitation of the data in Mueller et al is that it does not contain an entire business cycle episode and so cannot provide this evidence.

Although they do not have data that covers an entire business cycle episode, Mueller and coauthors can assess how the correlation of changes in aggregate variables with changes in perceived job finding rates. The main body of Mueller et al (2021) does not report any evidence on this issue, though there are some results in the online appendix. There they report that there is no statistically significant relation between perceived job finding probabilities and the level of unemployment (though with large standard errors), but they find significant correlations between perceived job finding probabilities and expected changes in the stock market and unemployment.

Two of the reported regressions suggest that perceived probabilities do respond to some changes in the aggregate economic environment. The regression result about unemployment strikes me as very inconclusive. Viewed through the lens of a standard Mortensen and Pissarides model, the aggregate level of unemployment is not a state variable and so need not be correlated with the job finding rate during a recovery period; unemployment rate dynamics could be driven by transition dynamics following a shock. It would be more interesting to study the relationship between time series changes in observed job finding rates and perceived job finding rates, controlling for potential composition effects, but I did not see these results reported.

While my reading of the evidence does not lead me to conclude that there is no basis for the departure from rationality that Menzio considers, I do not see a strong case for elevating it beyond the category of “empirically plausible”. As I mentioned earlier, I think the set of empirically plausible departures is a very large one. For this reason it is unclear how much weight we want to attach to the results associated with this departure. In fact, I think there are other empirically plausible departures that can generate very
different results. One of the examples considered in this paper is an economy in which all workers believe that there are no aggregate shocks to the economy. The result of these beliefs is that wages are completely rigid, and in particular, fluctuate less than they would in the rational expectations equilibrium.

Consider an alternative set of beliefs for workers. In particular, instead of workers believing that the future state of the economy will always look like the time series average of the past, suppose we assume that workers always believe that the future state of the economy (i.e., aggregate productivity) will be the same as it is today. Such expectations are not rational, but seem no less plausible than the case considered in the previous paragraph. Menzio does not consider this set of beliefs in his paper, and I have not worked through the details, but it is intuitive that this will generate the opposite pattern. That is, wages will now fluctuate more than they would in the economy with rational expectations.¹

3. The Mechanism

Let me now turn to the second component of the paper: the mechanism through which the specific departures from rational expectations that Menzio considers are translated into effects on aggregate labor market outcomes. How one views this component depends heavily on one's view about how wages are determined. Menzio only considers the possibility that wages are determined via an alternating offer bargaining game. As he makes very clear in the paper, worker expectations have an impact on labor market outcomes only to the extent that they affect strategic interactions through the bargaining game. With the exception of the bargaining game, workers are completely passive: they have zero cost of search so whenever unemployed they search, and once matched they remain employed until their match is exogenously destroyed.

While the bargaining game that Menzio assumes is common in the literature, it is not the only way in which the literature models wage determination. Consider the wage posting model of Burdett and Mortensen (1998). The physical environment in this paper is somewhat different than the one in Menzio’s paper; it allows for on the job search but assumes that meeting rates are exogenous, though it can easily be extended to include a matching function and have meeting rates determined endogenously. For concreteness, I will focus on the case in which meeting rates are the same for unemployed and employed workers. The key result that I want to highlight is that in the rational expectations equilibrium of this model, everything is determined on the firm side. All that matters from the worker side is the disutility of working, and in equilibrium, workers are completely passive: they search whether employed or unemployed; when unemployed they accept their first job, and when employed they accept any job that offers a higher wage than their existing job. Importantly, assuming that workers perceive meeting rates to be the same when unemployed or employed, worker expectations about meeting rates have no impact on the equilibrium wage distribution or allocations in this economy. That is, there is no channel by which worker misperceptions about meeting rates would affect outcomes.

To be sure, one can extend this model in ways that would create a channel through which worker perceptions of meeting rates would affect equilibrium outcomes. For example, one could add a worker

¹ If the aggregate shock is quite persistent, the quantitative magnitude of this effect could be quite small. But even so, a result of no effect on wage variability is quite distinct from the result that Menzio finds.
decision regarding search intensity. Importantly, this channel is quite distinct from the channel that Menzio studies.

The main point from the previous discussion is that the effect of worker expectations is very much dependent on what one assumes about wage setting protocols. I think which wage setting protocol best fits the data remains an open question. Wage setting protocols in the spirit of Cahuc et al (2006) are perhaps of particular interest. Consider a model like Burdett and Mortensen but assume that firms differ in their productivity level. Rather than assuming that firms post wages, now assume the following protocol. If an unemployed worker meets a firm, the firm makes a take it or leave it offer in which the outside option for the worker is being unemployed. If the worker is employed and meets another firm, then the two firms play a Bertrand game in which the worker chooses the firm with the higher productivity, and the wage is such that it is the maximum of the worker’s current wage and the wage that would leave the lower productivity firm with zero payoff from the match. This protocol does not attribute a role to worker perceptions of meeting rates. But this need not be the case for other protocols. In fact, like Menzio, the Cahuc et al (2006) paper assumes that when an unemployed worker meets a firm, the two play an alternating offer bargaining game. There is a rich set of possibilities here.

Quite apart from the issue of how different wage setting protocols fit the patterns in the wage data, there is one feature of the equilibrium in Menzio’s paper that I find somewhat unappealing from an aesthetic point of view. Given how he sets up the strategic bargaining game, agents with rational expectations must know both how many individuals have irrational beliefs, and what the exact nature of their irrational beliefs are. The reason I find this somewhat unappealing is that one rationale for considering departures from rationality stems from the perspective that rationality requires a large capacity for accessing and processing information. If this is costly to the individual, it creates an incentive for them to find simple “rules” that are easy to implement and have relatively low cost in terms of foregone utility. But in Menzio’s framework, the informational demands on a large subset of agents can become much greater as we move to the equilibrium with departures from rational expectations.

Viewed from this perspective, and starting from the rational expectations equilibrium in Menzio’s model, one might argue that his departure from full rationality has things backwards. That is, the most complicated element of decision making in the rational expectations equilibrium is the strategic considerations associated with wage determination, so that if one was looking to adopt simple rules to avoid the most complicated calculations, it might make sense to vary the wage setting protocol rather than have workers fail to realize the existence of business cycles. Having said this, I should note that Menzio does not explicitly offer a rationale for why individuals might have stubborn beliefs, and so in particular does not appeal to information processing capacity as a rationale.

4. Discussion

I wrote at the beginning of my comment that I view the general objective of this paper to be the exploration of how departures from rational expectations can affect aggregate outcomes in models with frictional labor markets. All of the examples in the paper focus on the beliefs of workers. This is perhaps understandable given that the evidence in Mueller et al (2021) focuses on worker perceptions. But from a broader perspective, the focus on worker expectations in these models is somewhat curious.
In the class of models that Menzio studies, the only allocation decision for the economy is the number of vacancies that are posted by firms. Because the posting cost is incurred today and the potential returns come in the future, the vacancy posting decision is essentially an investment decision. If one is interested in exploring how departures from rational expectations matter for equilibrium outcomes it seems natural to focus on the expectations of those agents who make dynamic allocation decisions. As noted earlier, worker expectations matter in this economy purely through their impact on the outcome of the bargaining game.

One response to this comment is that there is no novelty in assessing how expectations affect investment decisions. While I do not disagree with this, I think the power of firm expectations to influence wages in benchmark models of frictional labor markets is something worth noting in the context of the exploration that Menzio undertakes. In what follows, I will assume that rather than wages being determined via a bargaining game, firms make take it or leave it offers to workers. (Alternatively, I could assume that firms post wages.) This serves to make workers completely passive. The physical environment is the same as that studied by Menzio; the only difference is the assumption about wage setting. Note that as in Menzio, there is no on the job search. The unique rational expectations equilibrium for this economy will have the property that the wage rate is always equal to the disutility of working. This outcome emerges because firms have correct beliefs about a worker’s disutility of work, or equivalently, have true beliefs about a worker’s reservation wage.

Now assume that all firms are endowed with the same irrational expectations regarding this parameter. The equilibrium wage will then be whatever one assumes about firms beliefs. Put somewhat differently, if the modeler is free to endow firms with irrational beliefs about workers’ preferences parameters (and hence indirectly about their reservation wages), then the modeler has immense freedom to rationalize wage outcomes.

5. Conclusion

I would like to begin my concluding remarks by viewing this paper in relation to Mueller et al (2021). Those authors interpret their evidence on perceived and actual job finding rates to be prima facie evidence that some workers have incorrect beliefs about job finding rates. They go on to explore how this might affect the decisions that individuals make. In particular, they were interested in the possibility that this might help explain the incidence of long duration unemployment spells. The intuition is clear: an individual with a low job finding rate will tend to experience a longer unemployment duration, but if that individual is also overly optimistic about the probability of receiving an offer, they may set too high of a reservation wage, thereby amplifying the effect of the low job offer arrival rate. The authors evaluate this effect quantitatively in the context of a standard McCall style search problem in which unemployed workers receive offers from a wage distribution with cdf $F(w)$ with some probability $\lambda$, where $\lambda$ is allowed to vary across workers. The authors show that allowing some low $\lambda$ individuals to have overly optimistic beliefs in accordance with those found in the survey data can generate a non-trivial increase in the incidence of long duration unemployment spells.

Menzio’s key insight is that the consequences of misperceptions about job finding rates may go well beyond the individual workers. If worker expectations of future outcomes affect wages, and wages in turn affect vacancy posting decisions, there is a possibility that a group of workers with incorrect beliefs about future job finding probabilities may affect job finding rates for everyone. That is, incorrect beliefs
held by one group of workers may affect the employment volatility that all workers face via general equilibrium effects mediated through wage setting.

Menzio develops this idea in a set of models that impose a particular structure on expectations and assume a particular protocol for wage setting. The analysis in the paper serves to establish the theoretical plausibility of such effects. But I think the question of whether these effects are playing an important role in shaping outcomes in labor markets remains an open one.

References


