

Comment on Rocheteau and Wright, “Inflation and Welfare”

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1. The conventional wisdom outlined by Lucas

This fascinating paper contains a contribution to the welfare cost of inflation literature. The authors use a version of a search-theoretic approach to monetary economics which emphasizes periodically centralized and decentralized markets. The centralized markets do not require the use of money, but agents may wish to hold money in order to facilitate exchange in the decentralized markets. Models in this class are known for highly stylized abstraction and typically emphasize purely theoretical findings. However, in this paper the authors attempt a quantitative-theoretic assessment of the welfare cost of inflation under alternative price formation mechanisms.¹ That they were able to do anything like this is what makes the paper fascinating.

The authors make progress by following the approach that Robert Lucas used in his 2000 *Econometrica* article, “Inflation and Welfare.” That model was also highly stylized, but Lucas was able to use available data over the past century to calibrate the model’s implied money demand. He then computed the welfare cost of inflation armed with the calibrated values for key parameters. Rocheteau and Wright use the same procedure and in fact keep the analysis completely comparable to Lucas by using nearly the same data and the same definition of a time period, which is one year.

But there is an important difference between Lucas on the one hand, and Rocheteau and Wright on the other. The difference is that Lucas induces a demand for money by including money as an argument in the utility function,² while Rocheteau and Wright create a demand for money by introducing frictions into the trading environment in which agents operate. Lucas is perhaps the most prominent among a large group of economists holding the belief that placing money in the utility function is a *convenient fiction* that does not cause

¹Quantitative assessments of the welfare cost of inflation have been carried out in several closely related papers in this literature, such as Lagos and Wright (2005).

²See Lucas (2000, Section 3).

too much damage when evaluating the merits of a relatively low steady state rate of inflation as against a relatively high steady state rate of inflation. This group presumably includes many of the large number of economists now working in versions of Woodford’s (2003) approach to monetary policy analysis. In that literature, money is in the utility function, if indeed money is in the model at all. Rocheteau and Wright would like to understand whether providing explicit microfoundations for money exposes a flaw in the convenient fiction argument. They want to know whether a money demand relation that seemingly looks the same when compared to data, might, when tracing back through the equilibrium relationships of the model, have very different implications for household welfare.

A moment’s reflection might suggest, *a priori*, that Rocheteau and Wright will be able to successfully locate a model with explicit microfoundations that has different policy implications when compared to Lucas. This is because, in specifying explicit microfoundations, Rocheteau and Wright have considerable leeway. The number of plausible models that could be written down is large, and some will likely have important quantitative implications for the welfare cost of inflation. The authors have identified at least one such model in this paper. I do not think it was easy to find it. I also think that the nature of the friction that causes the departure from Lucas is somewhat surprising and therefore provides an important addition to our knowledge in this area. Still, there are a lot of possible models out there. This literature will eventually have to provide microeconomic evidence concerning the frictions that are introduced in order to sort out which ones provide the most compelling theory of pricing and trade in actual decentralized markets. I will not dwell on this point, as I think it is widely understood that any frictions introduced need to be quantitatively appealing. The spirit of the analysis is more of the form: Are there any frictions at all, even ones that may not later pass a data-based test, that could shake the logic of the Lucas argument?

2. Interpreting the main findings

Since there is perhaps not that much direct evidence on the nature of actual pricing and trade in decentralized markets, at least not that decisively settles the matter, the authors examine the consequences of several different mechanisms. The heart of the paper is to show how the nature of these mechanisms can matter for a policy issue of major consequence. The mechanisms are culled from the recent search-theoretic literature in both monetary theory and labor economics. The first is what might be thought of as the standard, bilateral bargaining yielding what the authors term search equilibrium. The second is Walrasian price-taking yielding what the authors call competitive equilibrium. The third is price posting with directed search implying what the authors refer to as competitive search equilibrium. It turns out that competitive search equilibrium is more comparable to the Lucas analysis than what is here called competitive equilibrium. Therefore, for purposes of simplifying this discussion I will focus on just two of the three cases, namely search equilibrium and competitive search equilibrium, which is to say bargaining versus price posting with directed search.

The innovation in this paper is not just in the variety of mechanisms. The authors also endogenize the composition of agents participating in markets, so that inflation affects both the frequency of trade, the extensive margin, and the more-usual quantity exchanged per trade, the intensive margin. This means there are two ways in which inflation may distort macroeconomic outcomes, and indeed a simple way to understand the paper is to consider mechanism-margin pairs. In search equilibrium, trade is inefficient along both margins, and both of these inefficiencies are generally exacerbated by inflation. In competitive search equilibrium, low (Friedman rule) inflation is efficient on both margins, and inefficiency arises only as inflation is increased. This latter case sounds more like the Lucas analysis, and in fact the authors find that for this mechanism, when comparing 10% versus zero inflation,

the consumption equivalent welfare cost is about one percent. The ratio of ten percentage points of inflation to one percentage point of welfare cost is about what the literature has reported to date, and is consistent with Lucas. The key contribution of the paper is actually this particular finding regarding competitive search. The finding under bargaining, that eliminating a 10% inflation has a much larger welfare benefit of about 4% of consumption, was known from Lagos and Wright (2005).

One conclusion might be that the Lucas (2000) money-in-the-utility function approximation is valid if the mechanism is posted pricing with directed search. The authors could be viewed as having identified a mechanism that rationalizes Lucas’s convenient fiction in a microfounded model. Further, this mechanism avoids the holdup problem which is at the heart of the large welfare cost associated with the search equilibrium, and so might possibly be viewed as more reasonable.

But a different, and in my opinion better, take on this paper is that the “pure money demand” welfare cost of inflation may be much larger than the profession has thought to date. This take puts more emphasis on the findings associated with search equilibrium, and on the authors’ efforts directed toward better understanding of this phenomenon. I was so impressed in looking at the upper left hand panels of Figures 1, 3, and 6 in this paper, and comparing them to Figures 2 and 3 in Lucas (2000, p. 251). The figures are not appreciably different in the two papers. Given Lucas’s extensive discussion of the area under the demand curve as a reasonable approximation to the welfare cost of inflation, as worked out originally by Bailey (1956), one cannot help but think in viewing these figures that the Rocheteau and Wright model will deliver similar conclusions to Lucas. Yet it does not, at least for some cases. The area under the demand curve is not even remotely the right approximation in these cases.³ This suggests to me that we have a great deal to learn from models that take

³Craig and Rocheteau (2005) provide a more detailed analysis of the Bailey (1956) approximation and its relationship to the findings in this and related papers.

the microfoundations of money seriously, and that the conventional wisdom that has been handed down on this issue may be badly mistaken.

This is not the first paper to talk about relatively large welfare costs of inflation. What is interesting is that the large cost stems from the frictions that cause agents to value money in exchange. Other large welfare cost papers often bring in new issues. The rate of inflation might be a determinant of the long-run rate of output growth in an endogenous growth model, for instance, so that permanently higher inflation causes permanently lower rates of output growth and therefore has a very large welfare cost. Or, tax systems, and especially capital taxation, may be poorly indexed to inflation, so that changes in inflation alter real tax rates and have substantial welfare costs.⁴ These are completely valid, even critical, concerns, but they are separate from the pure money demand component of the welfare cost of inflation.

3. References

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⁴I think this is a major issue. See Bullard and Russell (2004).

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