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Our analysis in chapters 3 and 4 shows that it is possible to have a theory of money which puts its representativeness at the centre while at the same time allowing for the existence of equilibria where money is valued and allowing for the influence of monetary variables on real allocations. We wish to conclude by discussing two open methodological issues:

Monetary vs. Real contracts In chapter 3 we assumed that agents did not accept those non-monetary goods in exchange which they did not plan to consume themselves. In chapter 4 we assumed that the prior commitments were in nominal rather than in real terms. These assumptions justified by the evidence of the extreme rarity of the direct exchange of goods against goods and the relatively small proportion of real intertemporal contracts compared to nominal intertemporal contracts. But this still leaves open the question of why this is so.

We could have relaxed both assumptions and allowed monetary and real exchange as well as monetary and real commitments to coexist. But the question that then arises whether it is possible to have economies with equally good welfare properties that do not employ intrinsically valueless money at all and are organised on the basis of
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commodity money and real assets. Or to put it somewhat differently, if agents are free to choose whether they will write their contracts and menus in either nominal or real terms, why will they ever choose nominal contracts at all?

The question is one of relevance beyond the confines of our study. The current orthodoxy is monetary economics (as represented say by the monograph Woodford (2003) or the textbook Walsh (2010)) has money being neutral in the short-run due to the stickiness of nominal prices. However it is taken for granted that prices are set in the same unit of account in terms of which the central bank conducts its money policy and that there are fixed 'menu costs' that prevent these prices from being perfectly flexible. While this is certainly empirically valid (see for example Bils and Klenow (2004)), it needs to be recognised that both these facts follow from economic decisions of agents and therefore it should be possible to derive them from the incentives and constraints being faced by those agents. Till this is done we cannot claim to have a complete understanding of the working of money in modern economies.

One class of models that has some bearing on this question is those of the degree of indexation where the choice is between nominal contracts and contracts denominated in terms of fixed, small set of price indices (see for example Mukerji and Tallon (2004)). In these models there are equilibria where the nominal contract is chosen over indexed contracts because the basket of goods in the index is not well-
correlated with the agent’s consumption basket. However, by restricting the alternative to only a subset of possible real contracts, this result does not help us answer the problem of choice between nominal contracts and arbitrarily detailed real contracts. Intuitively we understand that such arbitrarily detailed real contracts would have higher costs of bargaining and enforcement compared to simple nominal contracts. However, despite economists’ long interest in bounded rationality (Simon, 1978, 1979) a formal modelling of these costs still seems to be out of reach.

**The Hahn Problem** In both our models, alongside equilibria where money is valued there exist equilibria where money is valueless. This has been known as the ‘Hahn Problem’ in monetary economics following Frank Hahn’s demonstration (Hahn, 1965) of this property in Patinkin’s monetary model. Hahn himself has argued that the Hahn Problem is evidence of the inadequacy of the models in which it can be shown to occur. However, we believe that an alternative interpretation is possible. In our understanding the Hahn Problem only shows that the model under consideration is truly a model of representative money. If money has no use in production or consumption, its value can only arise from a belief that it will have a value in the future. A situation where no one holds such a belief and hence money is valueless is as self-consistent as a situation where everyone holds such beliefs and money has value.

While this may make it seem that the value of money is left hanging
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by its bootstraps, this situation is no different from how many other social institutions other than money functions. A direct analogy can be made with language where meaning attaches to words arbitrarily and without any external fiat, yet the links between words and meanings is sustained through mutual reinforcement between beliefs and actions of language users. To stretch the analogy somewhat dangerously, the prior nominal contracts in our model of chapter 4 are like dictionaries, mapping the beliefs of one period to the actions of the next.

Even if we argue that intrinsically valueless money is valued as a result of self-reinforcing beliefs, it is still necessary to explain the stability of those beliefs: after all hyperinflations have been rare events. In chapter 4 we offer possible explanations in terms of the existence of prior contracts and a nominal interest rate policy. However, we do not make any claim of exclusivity for this explanation. A role certainly is played by the support provided by the State to the national money.

This support take a number of forms. First, by establishing the currency issued by it as legal tender and running a central bank which can act as a lender of last resort the State provides the secure root around which a payments system can grow allowing the national currency to be used as a means of exchange. Second, by carrying out its own taxation and expenditure transactions with the private sector in terms of the national currency, the state ensures that all private entities have at least some claims and obligations that are fixed in terms of national currency. Third, by demonstrating its commitment to ensuring the sta-
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bilisation of the price level or the level of inflation, and to the extent that this commitment is credible, the State reduces the risk involved in making nominal commitments.

The last two functions of the state can be formally incorporated in the model of Chapter 4 by assuming that some of the pre-existing nominal obligations of the private sector are obligations to the State and that the belief in the State's ability to stabilise prices is the force driving the inelasticity of the private sector's nominal expectations.

However, the relationship between the State and money may overflow the bounds of the purely economic. First, in its quest to stabilise prices the State may use political instruments in addition to the economic instruments of monetary policy (see for example Patnaik (2008)). Secondly the confidence of the private sector in the national currency may not just be the result of rational calculation of the State's ability to maintain its value but may be bound up with the entire complex ideological mechanism through which the State maintains its legitimacy. The study of these issues require a combination of political and economic analysis for which both the theoretical tools and the empirical basis need further development.