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Douglas Gale's contribution to money and equilibrium

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ABSTRACT

No abstract required

1. Introduction

Douglas Gale's contributions to modern economic theory have been fundamental, influential, and numerous. But unlike his contributions to general equilibrium theory, financial economics, game theory, and information economics, which have become classics in the field, his work on monetary economics, monumental as it is, seems to have left a more fleeting impression on the profession. Three of his five first publications, all published in leading journals, were on the theory of money – and then he published nothing more on the subject for more than 30 years. However, Gale collected his early work on money in two volumes, "Money in Equilibrium" (1982) and "Money in Disequilibrium" (1983), which go far beyond his three published articles and constitute an amazing tour d'horizon of monetary macroeconomics after Robert Lucas had visited the scene in 1972.

When I was a PhD student in the late 1980s, like many smart kids I wanted to understand money. My teacher and supervisor, when I told him of my ambition, went to his bookshelf, took down the two volumes by Gale, and said "Then you must read this." And so I did (almost fully). And just like Douglas Gale had done, but without my being aware of this, afterwards I began to work on banking and finance. But I have recently returned to the theory of money from the point of view of banking and finance.[1] The modern theory of money is far too broad and too much in flux to be reviewed here, but in this short note, as a tribute to Gale's early work, I will take a brief look back at Money in Equilibrium.

2. Two volumes on money

Gale's two volumes on money are highly original, rigorous, eclectic, and opinionated. The volume on "Money in Disequilibrium" is concerned with fixed prices, rationing, and Keynesian theory in the aftermath of Patinkin (1965). Brilliant in its attempt to formalize such questions in terms of general equilibrium and related microeconomic concepts, it often strays from the narrow path of classical monetary theory and sometimes gives in to the temptation of being rather critical.[2] This probably has not helped winning the hearts of all economists interested in "the progress or lack of progress in bridging the gaps between micro and macroeconomists" (Shubik, 1985). My favorite has always been the more microeconomic-minded volume on "Money in Equilibrium", which is firmly grounded in general-equilibrium theory.[3] As with "Money in Disequilibrium", this focus may not have been to the taste of some parts of the macroeconomic profession at the time. In his review at the time, no one less than Shubik (1985) concedes that "this is a useful and well-written handbook" but goes on to state that "the misgivings and reservations that I have about it concern the subject as a whole, the approach adopted, and, to a great extent, what was left out rather than what is in" (p. 126).

So, what is in? In its first part, "Money in Equilibrium" is an unequivocal and well-argued adulation of Lucas (1972, 1976). It reviews some of the classic questions of monetary theory, such as real balances and neutrality, revisits the modern classics, Patinkin, Hahn, and Friedman, and reviews first and foremost the very modern classics, in particular Lucas, Sargent, and Wallace. Here the emphasis is squarely on efficiency, information, expectations, and monetary policy.

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[1] First notes are in Gersbach, Rochet and von Thadden (2024).

[2] "This is a book about macroeconomics in the old-fashioned sense. It deals with simple aggregative models of the sort that seem to be essential for policy analysis. The trouble with this sort of theory is that it is almost always done in an unsatisfactory way." (Money in Disequilibrium, pp 5-6)

[3] "Keynesian theory has a certain claim to realism, but it is often muddled, ad hoc, and partial. As long as this is the case, sensible theorists will have recourse to "unrealistic" general-equilibrium models about which they can think clearly." (Money in Equilibrium, p. 5)

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In its second part, the book develops a theory of money based on the sequential core of dynamic Arrow-Debreu economies, constructed around sequential budget constraints. This fascinating account of Gale's early thinking summarizes his above-mentioned articles, Gale (1978, 1980, 1981). It builds on Radner's (1972) work on sequence economies and pushes its limits far into the territory of cooperative and non-cooperative game theory to find a role for money as a medium of exchange. It is a mathematical tour de force, with many new concepts, insights, and non-trivial proofs. But the chapter on cooperative games still ends on a more than cautious note: "It may be that the theory of cooperative games and the core in particular are ill-suited to provide a foundation for the theory of monetary equilibrium" (p. 288). The final judgment after the next chapter on sequential market games is not much more optimistic. While this probably has much to do with Gale's modest and skeptical nature in general, it may also provide a hint at why he has stopped working on the pure theory of money afterwards.

My favorite in this volume is Chapter 4 on "The economic costs of inflation". It is a very pragmatic and learned discussion of a problem of first-order policy relevance, and it also shows how gifted a writer Gale is.[4] The chapter actually is a discussion of the monetary effects of capital market imperfections; and what one may call his "balance sheet theory of the costs of inflation" is modern in its perspective and anticipates future theory.

The discussion bears the marks of the "Great Inflation" in the UK in the 1970s that was triggered (though not caused exclusively) by the oil price shock of 1973. The story as summarized by Gale is much very reminiscent of the European experience in 2022: In a market with highly inelastic demand and a period of relatively low and steady prices there is an unexpected large increase of these prices, followed by a period of steep inflation in the importing countries. Gale's discussion then very quickly addresses the key issue of the transition to a possible new steady state that is necessary because of the structural change of supply. Other than in the 2020s, in the 1970s this concerned the revenues of the cartel at the origin of the price hike: "From the point of view of monetary economics, the important issue is the recycling of the revenues earned by the petroleum-exporting countries and its effect on the money supply of the importing countries" (p. 149). But although this feature is different, his analysis ends up with a surprisingly modern conclusion: "The consequent rise in unemployment and fall in the rate of growth could have been caused not by inflation, but by insufficient …inflation" (p. 151). It is instructive to compare this conclusion to the discussion in the 2023 ICMB Geneva Report (Guerrieri et al., 2023) that argues in favor of "taking a bit longer to return inflation to target, as relative prices adjust and activity recovers. … The weakness in activity and the less supportive fiscal stance in the euro area, along with the lags of monetary policy transmission, all advocate for more patience."

Though written more than 40 years earlier than the Geneva Report and without the insights of several decades of research of modern monetary economists, Gale's analysis anticipates the importance of the sectoral, distributional, and financial mechanics of the transmission of monetary shocks with impressive clarity. But it is probably this type of analysis that has contributed to what has been to me one of the most remarkable insights from his book. It is stated upfront in the introduction: An "omission that must be explained is the almost total neglect of banks and banking … The development of a proper theory of banking seems to me to be one of the top priorities for future research in monetary economics" (p. 5–6). As we know, this is what Gale turned to soon afterwards.[5]

3. The next 40 years

The "proper theory of banking" occupied Gale for a long time – and it took him very long to return to money. The first such instance seems to have been in an influential paper on banking fragility with Allen (Allen and Gale, 1998), where money is introduced in an otherwise real model at the end of the third section through Central Bank interventions that take the form of money injections. While this sudden appearance of money comes a bit as a surprise, the first fully formulated monetary model in a theory of banking fragility along the above lines still took more than 15 further years to be published, in Allen, Carletti, and Gale (2014), building on the dissertation of Skeie, published in Skeie (2008).[6] There have been several further excursions into monetary theory since 2014, but a broader synthesis of the type proposed in "Money in Equilibrium" more than 40 years ago is sadly still missing.

CRediT authorship contribution statement

Ernst-Ludwig von Thadden: Conceptualization, Investigation, Methodology, Writing – original draft, Writing – review & editing.

Data availability

No data was used for the research described in the article.

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[4] And a writer of his times: "Businessmen, trade unionists, and housewives all know very well the costs of inflation. … Few seem to doubt the reality of the economic convulsions caused by rising prices. And yet pure theory is hard pressed to explain the consequences which are popularly attributed to prolonged and steady inflation" (p. 136).

[5] A notable exception is the work with Hellwig on the transactions demand for money (Gale, Hellwig, 1984). But this paper is unpublished and unfinished.

[6] … which incidentally was influenced by Allen and Gale (1998).