Expectations in Tobin's Macroeconomics: The Fisherian and Keynesian Roots of Tobin's q and Corridor of Stability

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1 Introduction

Expectations were central to James Tobin's macroeconomics. His q theory of investment rested on treating equity prices as an observable measure of expectations of profitability (Brainard and Tobin 1968, Tobin and Brainard 1977). His post-1971 analysis of macroeconomic stability or instability, whether the economic system is self-adjusting after large demand shocks, depended crucially on how responsive expectations are to new observations (Tobin 1975, 2003). Along with Hicks (1935), whose influence on Tobin did not primarily involve expectations, two economists were major influences in shaping Tobin's approach to economics: John Maynard Keynes and Irving Fisher. Keynes's *General Theory* (1936) was the first economics book Tobin ever read, assigned to the 18-year-old Harvard sophomore in September 1936 for a weekly tutorial, and Tobin always declared himself an unreconstructed "Old Keynesian"[1] (Tobin 1992, 1993, 1997, Colander 1999, Shiller 1999, Dimand 2014). Tobin shared Keynes's emphasis on animal spirits driving long-period expectations about returns on investment, with Tobin's q providing a channel through which such changes in expectations had real effects. Fisher had been admired by Tobin's teacher Joseph Schumpeter, and after joining Yale in 1950 as an associate professor (Tobin was never an assistant professor), Tobin developed a deep appreciation

[1] Ironically in light of his subsequent interpretation of Keynes, Tobin's first publication, based on his undergraduate thesis (Tobin 1941), had attributed money illusion to Keynes's analysis of the labor market—at a time when Milton Friedman was still writing about fiscal policy to control inflation, rather than monetary policy (Shoup, Friedman and Mack 1943).

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of Fisher's economics (e.g., Tobin 1987a) and took the lead in rebuilding Fisher's reputation, battered by Fisher's unforgettably pithy and quotable conviction that in October 1929 stock prices had reached a permanently high plateau. Fisher (1896) had emphasized expectations of inflation as the wedge between real and nominal interest rates, and later used distributed lags of price changes to show how slow adjustment of inflation expectations changed real interest to change, as in Fisher (1926), making unemployment and output fluctuate (Dimand 1999). Fisher's 1906 concept of the net present value of the expected stream of earnings as the market value of assets provided the numerator of Tobin's q. The tension in Fisher's work between Fisher's neoclassical theory of interest and capital, showing the coordinating role of financial markets, and Fisher's debt-deflation theory of great depressions (Fisher 1933, Tobin 1980a), showing how such coordination could break down, was mirrored by a tension in Tobin's work between an appreciation of the technical efficiency of the financial system (e.g., Tobin 1969, 1971) and a concern that large demand shocks could push the economy outside the corridor of stability within which it was self-adjusting.

2 Keynes's Q, Tobin's q, Fisher's Net Present Value

The driving force of the economic system in John Maynard Keynes's *Treatise on Money* (1930) was Q, profits or windfalls, equal to I−S, the *ex-post* difference between investment and saving. The symbol Q for above-normal profits brought Alfred Marshall's quasi-rents to the reader's mind (Keynes's 1933 and 1934 lectures defined Q as expected quasi-rents, Rymes 1987, 1989). Profits in the production of consumption goods were $Q_1 = I' - S$, while profits in the production of investment goods were $Q_2 = I - I'$, where I is the market value of newly produced investment goods and I' the cost of producing those investment goods. Q in that sense was a measure of surprise, causing entrepreneurs to change their expectations of profitability and thus affecting their investment in the next period. In one passage, however, Keynes (1930, Vol. I, p. 159, italics in original) remarked that, "We have spoken so far as if entrepreneurs were influenced in their prospective arrangements entirely by reference to whether they are making a profit or loss on their current output as they market it [but] it is obviously the anticipated profit or loss on new business just concluded, which influences them in deciding the scale on which to produce and the offers which it is worthwhile to make to the factors of production. Strictly speaking, we should say that it is the *anticipated* profit or loss which is the mainspring of change, and that it is by causing anticipations of the appropriate kind that the banking system is able to influence the price-level." Tobin's q (or Tobin and Brainard's q, since it first appeared in Brainard and Tobin 1968, written with his then Ph.D. student and later colleague William Brainard), the ratio of the market value of equity to the replacement cost of the capital underlying the equity, would be greater than, equal to, or less than one as Keynes's Q_2 was greater than, equal to, or less than zero. In the notation of Keynes (1930), and ignoring for the moment that Tobin's q refers to the market value and replacement cost of the stock of capital rather than of

the period's new investment goods,[2] Tobin's q would be I/I′ where Keynes's Q_2 was I−I′. Tobin's q was a measure of expected profit because the market value of equity, the numerator of Tobin's q, is the net present value of the expected stream of income from owning the equity. Net investment would be zero when $q = 1$. If q exceeded one, a company could increase its net worth of its existing equity by additions to its capital stock financed by issuing equity. The rate of investment would depend on how far q was from zero.

Klaus J. W. Schmidt (1995, p. 175) states that honesty requires that Tobin's q should be called Myrdal's Q, since Gunnar Myrdal used a similar concept and even the notation Q in an essay in Swedish in 1931 (expanded in a 1933 German version that was, unknown to Schmidt, translated into English as Myrdal 1939, reissued in Kelley's Reprints of Economic Classics in 1965). Being apparently unaware of Keynes's Q in *A Treatise on Money* (1930), Schmidt attached no significance to Myrdal's multiple citations of Keynes (1930) in 1931, repeated in 1933 and 1939, or to being told by Tobin of the influence on him of Keynes's *Treatise on Money*, the only mention of Keynes (1930) in Schmidt's article. Myrdal's Q was an explicit reference in 1931 to Keynes's Q of the previous year and indirectly to Marshall's quasi-rents (see Dimand 2014, pp. 75–76, 79–81[3]). Tobin with Golub (1998, p. 150 n3) followed Schmidt in stating that Myrdal "long anticipated q, even calling it Q! However, his Q was not a ratio but the absolute difference between market value and replacement cost."[4] However, Myrdal was only following the notation of Keynes (1930) and attempting to clarify Keynes's handling of *ex-ante* and *ex-post* concepts. Wicksell ([1898] 1936) influenced both Keynes (1930) and Myrdal (1939), especially Wicksell's distinction between natural and market rates of interest (see Jüttner 1987 on affinities between Wicksell and Tobin on investment, and note the reference by Tobin with Golub 1998, p. 264, to "the Wicksellian, *q* ratio story"). The lineage of Tobin's q is Keynesian, both to the *Treatise on Money* and *The General Theory*, and indirectly Wicksellian, through Wicksell's influence on Keynes's *Treatise on Money*.

The numerator of Tobin's q, the market value of equity, is the net present value of the income stream that investors expect to obtain by owning that equity, a concept that was the central message of Irving Fisher's *The Nature of Capital and Income* in 1906 (reprinted in Fisher 1997, Volume 2). For Fisher, the time pattern of expected income was fundamental; the stock of capital was simply the discounted value of that stream. Tobin, who was consulting editor for William Barber's 1997 edition of

[2]Tobin (with Golub 1998, p. 153 n5) credited Abba Lerner (1940, p. 334) as "the first to point out that there was a stock-flow confusion in Keynes's (1936, Ch. 11) investment function."

[3]That section of Dimand (2014) is based on joint work with Harald Hagemann.

[4]Tobin (in Tobin with Golub 1998) stated that he had not known Myrdal's Q (and followed Schmidt in thinking that Myrdal's monograph had never been translated into English). He only narrowly missed learning of Myrdal at a formative point in Tobin's career: The Canadian economist and public servant Robert Bryce, one of the translators of Myrdal (1939), was a graduate student at Harvard from 1935 to 1938, while Tobin was an undergraduate there. Bryce, who had attended Keynes's lectures from 1932 to 1934, brought the Keynesian message to Harvard (in the words of Schumpeter, Bryce's supervisor at Harvard, "Keynes is Allah and Bryce is his prophet") at a time when Tobin was discovering Keynes.

The Works of Irving Fisher, wrote the editorial introduction and afterword for only one of the fourteen volumes: *The Nature of Capital and Income*. In Tobin's writings on Fisher, such as his 1987 *New Palgrave* entry on Fisher (Tobin 1987a) or his 1985 article on Fisher and John Bates Clark for the *American Economic Review* special issue on the centenary of the founding of the American Economic Association, *The Nature of Capital and Income* always figured prominently.

Tobin always insisted on the importance of the numerator of q being observable, a summary of the expectations of investors. Fumio Hayashi (1982) offered a neoclassical interpretation of marginal q as the shadow price of installed capital in an optimizing model of investment subject to internal, strictly convex costs of capital stock adjustment (see Buiter 2003, p. F599). If both the production function and adjustment costs were linear homogenous in their arguments, marginal q (the shadow price of installed capital) would equal the average value of installed capital (Tobin's q). Tobin (interviewed by Shiller 1999, p. 887) objected that Hayashi's marginal q "is a shadow price of an optimal program solution … not something you could actually measure as a market variable."[5] Tobin was concerned with the Fisherian discounting of the stream of expected earnings as shown by asset prices.

According to Tobin (with Golub 1998, p. 152), "Empirically, it is quite obvious that stock market *q*s and formal implicit *q*s are not the same animals. Variations in marginal cost of adjusting capital stocks by investment would have to be implausibly large to be consistent with fluctuations in observed market valuations. Like Keynes's view, the position here is that the stock market does not grind out values by mirroring the rational optimization of informed managements but generates values of its own. These nevertheless provide incentives or disincentives for investment. Tobin's *q* is so far from being a thoroughgoing neoclassical theory that it is quite consistent with recognition that corporate managers and other economic agents respond to market noise and are in any case sluggish in responding to the arbitrage opportunities of large deviations of *q* from par."

3 Liquidity Preference as Behavior Toward Risk

"Nearly two decades of drawing downward-sloping liquidity preference curves in textbooks and on classroom blackboards should not blind us to the basic implausibility of the behavior they describe," stated Tobin (1958, p. 65). "Why should anyone hold the non-interest-bearing obligations of the government instead of its interest-bearing obligations?" For both Keynes and Tobin, the answer was that the price of bonds could fluctuate, but they interpreted that characteristic of bonds in contrasting ways.

[5] In addition to emphasizing the market prices of equities as a measure of expectations of returns on investment, Tobin also took an interest in survey data on consumer's intentions and expectations (e.g., Tobin 1959).

The title of Tobin (1958), "Liquidity Preference as Behavior Toward Risk," nodded to Keynes by referring to money demand as liquidity preference, but the title was exact in stating that the article was analyzing demand for money as an asset as behavior toward risk, not fundamental uncertainty. Tobin (1958) represented expectations of returns on risky assets by subjective probability distributions, whereas Keynes (1937) had insisted that expectations about an uncertain future could not be reduced to a probability distribution (but the account of the speculative motive in Keynes 1936 had investors holding a point estimate of the future interest rate with certainty, notwithstanding the emphasis on uncertainty pervading the rest of the book). Nonetheless, Tobin (1958) did build upon Keynes's account in *The General Theory* of the speculative motive for holding money and extended it in a way that brought it into closer agreement with the facts of how people hold wealth. Keynes (1936, pp. 170–74) posited that each wealth-holder had some expectation of what the interest rate would be in the future. Comparing that expectation of the future interest rate with the current interest rate yields a prediction of a capital gain or loss from holding a bond. If the expected capital loss exceeded the interest to be received on the bond, the wealth-holder would be better off owning no bonds and holding only cash. If the expected capital loss was less than the interest, or if the wealth-holder expected a capital gain on the bond, the wealth-holder should hold all of her or his wealth in bonds and none as money. The market price of securities will be the one that balances the sales of the "bears" who expect bond prices to fall (the interest rate to rise) with the purchases of the "bulls" who expect bond prices to rise and the interest rate to fall (Keynes 1936, p. 170). Each person holds an undiversified portfolio of all securities or all money, but expectations of the future interest rate vary across individuals, so liquidity preference is a function of the interest rate (as well as of the level of income), with a small rise in the interest rate switching a few people from being bearish about bond prices to being bullish. Keynes (1936, p. 172) found it "interesting that the stability of the system and its sensitiveness to changes in the quantity of money should be so dependent on the existence of a *variety* of opinion about what is uncertain. Best of all that we should know the future. But if not, then, if we are to control the activity of the economic system by changing the quantity of money, it is important that opinions should differ. Thus, this method of control is more precarious in the USA, where everyone tends to hold the same opinion at the same time, than in England where differences of opinion are more usual" (Keynes's italics). Keynes (1936) was the first to write money demand as a function of interest and income (except for Walras's *encaisse desirée* half a century before), or indeed to explicitly write any asset demand function (as distinct from verbal statements).

Tobin (1958) found it not merely interesting, but also unsatisfactory, that people with the same information should hold different expectations, and that a tiny change in asset prices should make investors switch all their wealth from cash to bonds or vice versa (see Tobin 1983, 1984b). Tobin was an admirer of Harry Markowitz's application of linear programming to optimal portfolio diversification: when the Cowles Commission for Research in Economics left the University of Chicago in 1955 to move to Alfred Cowles's alma mater, Yale University, with Tobin as director of the new Cowles Foundation, Markowitz moved with Cowles, working on the

Cowles Monograph published as *Portfolio Selection* (Markowitz 1959). Markowitz (1952) had already published the central concept of that study, combining risky assets in a diversified portfolio to minimize variance for each given expected rate of return on the portfolio, in his Chicago doctoral dissertation and an article that Tobin later chose to include in *Landmark Papers in Macroeconomics Selected by James Tobin* (Tobin 2002). Tobin derived a money demand function that responded to the interest rate like Keynes's liquidity preference function, but instead of assuming a distribution of people's point estimates about what the interest rate would be, Tobin assumed a probability distribution over what the interest rate would, with people who held the same information sharing the same subjective probability distribution about asset returns: "My theory of liquidity preference as behavior towards risk was built on a rational expectations model long before the terminology," Tobin told Shiller (1999, p. 878). This led Tobin to be, in the words of Buiter (2003, p. F587), "not an unqualified admirer" of the extension of the Tobin–Markowitz mean-variance approach by William Sharpe, John Lintner, and Jan Mossin into the Capital Asset Pricing Model (CAPM): The assumption of homogenous beliefs made CAPM, in the eyes of Tobin (1983), a representative-agent model, the sort of single-agent, no-trade model that Tobin considered unhelpful for understanding the economy (on which see Tobin 1987b, and on two-agent overlapping-generations models, Tobin 1980b). As with Tobin's 1952 statement of what later became known as debt neutrality or Ricardian equivalence (see Buiter 2003, p. F609, Dimand 2014, p. 50), Tobin here at least partially anticipated an approach whose later uses and extensions did not meet with his approval.

The separation theorem of Tobin (1958) showed, taking money as a riskless asset (in nominal terms) with an exogenously fixed return strictly lower than the expected return on risky assets, risk-averse investors would choose the fraction of their portfolio to hold in the riskless asset by trading off risk against expected return, but all would hold the same combination of risky assets, a result summarized by Buiter (2003, p. F587) as "regardless of your degree of risk aversion and caution, you will only need *two* baskets for all your eggs." Fisher (1928) had tried fervently to dissuade people from thinking of money as riskless, given fluctuations in the purchasing power of money; perhaps US Treasury Inflation-Protected Securities (TIPS) or UK or Canadian government real-return bonds would be more appropriate as riskless assets. Comments by Karl Borch and by Martin Feldstein in 1969 objected that Tobin's mean-variance analysis was exact only if asset returns were normally distributed (so that the probability distribution of returns was fully described by its first two moments) or if investors had quadratic utility functions (so that they only cared about the first two moments of the probability distribution of returns). Tobin (1971, p. 269) was unimpressed by the comments of Borch and Feldstein: "I do not believe it is an exaggeration to say that, until relatively recently, the basic model of portfolio choice in economic theory was a one-parameter model. Investors were assumed to rank portfolios by reference to one parameter only—the expected return, possibly corrected by an arbitrary 'risk premium,' constant and unexplained … This extension from one moment to two was never advertised as the complete job or the final word, and I think that its critics in 1969 owe us more than demonstrations that it rests on

restrictive assumptions. They need to show us how a more general and less vulnerable approach will yield the kind of comparative-static results that economists are interested in. This need is satisfied neither by the elegant but nearly empty existence theorems of state preference theory nor by normative prescriptions to the individual that he should consult his utility and his subjective probabilities and then maximize."

4 Expectations and Macroeconomic Instability: An "Old Keynesian" View

Tobin (1980a, 1980b, 1987b) was an outspoken "Old Keynesian" critic of rational expectations and of New Classical claims to have established rigorous choice-theoretic general equilibrium microeconomic foundations for New Classical macroeconomics (see Lucas 1981b for a New Classical riposte). Like his younger colleague Robert Shiller (2000), Tobin (1984) doubted that financial markets were efficient in any macroeconomic sense of establishing asset prices that in reflected underlying fundamental values, or in preserving macroeconomic stability (see Colander 1999 and Shiller 1999 for connections between Shiller and Tobin). Tobin (1975, 1980a, 1992, 1993, 1997) argued that faster adjustment of prices and money wages could well be destabilizing (see Driskill and Sheffrin 1986, De Long and Summers 1986, Chadha 1989). Contrary to the conclusion by Don Patinkin (1965) that the Pigou–Haberler real balance effect ensured that, as a matter of theory rather than practical policy, a sufficiently low price level and money wage would always suffice to restore full employment, Tobin (1975, 1980a, 1992, 1993, 1997) held that the effect of falling prices, and the increased default risk associated with a higher real value of inside debt, could swamp the real balance effect of an increase in the real value of the small amount of outside money. In arguing so, Tobin drew on the analysis of the potentially destabilizing effect of money wage cuts advanced in Keynes (1936, Chap. 19 "Changes in Money Wages"), and, from Tobin (1980a) onwards, also on the debt-deflation theory of depressions of Fisher (1933).[6]

The crucial step in the development of Tobin's thought on macroeconomic stability came with the 1971 reprinting of his 1965 Irving Fisher Lecture to the Econometric Society about "Money and Economic Growth." Following the observation that "An accelerated decline in prices means a more attractive yield on money and encourages a further shift in portfolio demand in the same direction as the original shock," Tobin (1971, p. 145) deleted the original stability analysis and added, "The issue depends on the speed with which actual price movements are translated into expectations. If the process is sluggish—expectations are inelastic—then the stabilizing Pigou effect will win out. But, if current experience has a heavy weight in formation of expectations, the system can be unstable." Tobin (1975) provided a simple model demonstrating the possibility of instability if prices and money wages adjusted rapidly (see Bruno

[6]Minsky (1975) drew on Keynes (1936, Chap. 19), as did Tobin (1975), and on Fisher (1933), which did not appear in Tobin's writings until Tobin (1980a).

and Dimand 2009 for a derivation of the stability condition for Tobin's 1975 model, and Palley 2008). Tobin (1978, p. 524) elaborated on this possibility of instability when presenting his proposal for a tax on international currency transactions: "As a technical matter, we know that a rational expectations equilibrium in markets of this kind is a saddle point. That is, there is only a singular path that leads from disequilibrium to equilibrium. If the markets are not on that path, or if they do not jump to it from wherever they are, they can follow any number of paths that lead away from equilibrium—paths along which, nonetheless, expectations are on average fulfilled. Such deviant paths are innocuous in markets—as for rare coins, precious metals, baseball cards, Swiss francs—which are sideshows to the real economic circus. But, they are far from innocuous in foreign exchange markets whose prices are of major economic consequence." Where Milton Friedman (1968) had invoked adjustment of expectations to argue against the possibility of government intervention to improve macroeconomic outcomes, and Robert Lucas (1981a) invoked expectations that were satisfied on average to argue against any systematic effects of government macroeconomic policy, Tobin pointed to rapid adjustment of expectations as a source of instability and to the possibility of multiple paths for the economy, along each of which expectations would be satisfied on average. As Mishkin (1983) showed, policy ineffectiveness did not necessarily follow even if expectations were right on average.

Together with Hyman Minsky (1975, 1982, 1986), Tobin was responsible for directing attention to those two long-neglected works, Keynes's Chap. 19 and Fisher's debt-deflation theory (although neither Minsky nor Tobin cited Fisher 1932, on which Fisher 1933 was based, apart from Tobin's 1987 *New Palgrave* survey of Fisher's career). Tobin and Minsky both studied with Joseph Schumpeter and Wassily Leontief at Harvard, their studies at Harvard overlapping from 1946 to 1949 (Tobin received his Ph.D. in 1947, the year of Minsky's master's degree, but Tobin remained as a Junior Fellow for two more years). Nonetheless, Minsky (1981, 1986) and such followers as James Crotty (1990) upbraided Tobin for supposedly taking classical rather than Keynesian positions on each of the issues mentioned above (a denial of Tobin's credentials as a Keynesian that paralleled Tobin's denial, when interviewed by Colander 1999, that New Keynesians such as Gregory Mankiw were Keynesians). Minsky (1981) and Tobin (1989), their review articles of each other's books, reveal a failure to reach agreement about whether they agreed about Keynes, expectations and macroeconomic stability (see Dimand 2004).

Tobin (1989, p. 107) vehemently objected that Minsky (1986, pp. 5n, 133–138) "accuses the misguided Keynesians of embracing the Pigou–Patinkin real balance effect as a proof that flexibility of wages and prices ensures full employment so that government macroeconomic interventions are not needed. This is just not true. I, for example, say the opposite in publications that Minsky knows and actually cites," including Tobin (1975, 1980a). Tobin (1989, p. 106) concluded that "this 'post-Keynesian' theory [mark-up pricing] is not convincingly linked to the central

message of the book [Minsky 1986[7]], the financial theory of business cycles. Minsky's excellent account of asset pricing and investment decisions is separable from his theory of prices, wages and profits. It sounds like 'q' theory to me … He is right to stress that 'inside' monetary and financial institutions and markets make a big difference, and to reject 'Modigliani–Miller theorems that assets and debts which wash out in accounting aggregations wash out in economic effects as well. Minsky's classifications of debt finance—'hedge', 'speculative', and 'Ponzi'—are suggestive and helpful."[8] Tobin did not, however, succeed in persuading Minsky and Crotty that Tobin shared Minsky's view of asset pricing, investment, animal spirits, macroeconomic instability, and systemic financial fragility or even that he had claimed to do so.

James Crotty (1990) contrasted the Keynes-based approach of Hyman Minsky (1975, 1986) to systematic financial fragility, fundamental uncertainty, and shifting long-period expectations with the allegedly neoclassical q theory of investment, as presented in Tobin and Brainard (1977). Tobin and Brainard (1990, p. 543) responded indignantly, insisting that they had always shared Keynes's "stress in Chap. 12 of the *General Theory* on the inevitable role of non-rational attitudes—optimism and confidence or their opposites—in forming estimates of the marginal efficiency of capital … Nothing excuses [Crotty's] charge that 'Tobin places Keynes's stamp of approval on rational expectations, efficient-markets general equilibrium models that are the modern extension of the classical theory Keynes so vehemently opposed'" (a charge that would have surprised Minsky's former Berkeley student Robert Lucas 1981b).[9]

Crotty's phrase "Tobin's stable and efficient financial markets" particularly offended Tobin and Brainard (1990, p. 549): "We did not use the word 'stable'. Our word 'efficient' referred only to technical market-clearing efficiency. We did not say or mean that stock markets come up continuously with fundamental valuations. In our 1977 article, which Crotty cites, and in others on 'q', we followed Keynes in believing that speculation makes prices diverge from fundamental valuations. Again putting his own words in Tobin's mouth, Crotty says in his footnote 9 that in his 1984[a] article, 'Tobin appears to recant his belief in the valuation efficiency of financial markets.' The term 'valuation efficiency' does not appear in our 1977 article, and no other writing of ours, individual or joint, asserts such a belief. Tobin has nothing to recant." Tobin (1984a) viewed financial markets as informationally efficient in the weak and semi-strong senses that one cannot systematically profit by using generally available public information, and technically efficient in the sense that

[7]Minsky (1986) was published by the university press of Tobin's own university, Yale, and, as a Twentieth Century Fund study, listed opposite the title page the Twentieth Century Fund trustees, including James Tobin.

[8]Tobin made a similar remark when the present author wrote a term paper on Minsky's theory of asset pricing and investment for Tobin's Money and Finance course in 1979–80, a year after graduating from a Post-Keynesian-learning program at McGill.

[9]However, Colin Rogers (1989, pp. 119–122) tracked down a few instances where Tobin, and Brainard and Tobin (1968, pp. 353, 365), used the term marginal productivity of capital rather than marginal efficiency of capital.

one can trade large quantities of financial assets with low transactions costs, at little or no notice and without significant effect on market prices. He emphatically did not accept that financial asset prices necessarily reflect rational expectations of future payments from owning the assets ("valuation efficiency"), let alone that financial markets necessarily support Pareto-efficient economy-wide outcomes, what Tobin (1984a) termed Arrow-Debreu full insurance efficiency (see Buiter 2003, pp. F589, F604–F605, Shiller 2000).

5 Conclusion

In his q theory of investment, in his analysis of money demand and portfolio choice, and in his investigation of macroeconomic instability, Tobin focused on expectations, expectations of returns on assets and of inflation. His analysis was informed by his close study of Keynes (1930, 1936) and Fisher (1997), two economists for whose work he felt a strong affinity and whose work often served as his starting point even when, as with Tobin (1958) on liquidity preference as behavior toward risk, he was quite prepared to significantly modify their approach.

References

Brainard, W. C., & Tobin, J. (1968). Pitfalls in financial model-building. *American Economic Review: AEA Papers and Proceedings, 58*(2), 99–122.

Bruno, R., & Dimand, R. W. (2009). The corridor of stability in Tobin's Keynesian model of recession and depression. *International Journal of Applied Economics and Econometrics, 17*(1), 17–25.

Buiter, W. (2003). James Tobin: An appreciation of his contributions to economics. *Economic Journal, 113*(491), F585–F631.

Chadha, B. (1989). Is increased price inflexibility stabilizing? *Journal of Money, Credit, and Banking, 21*(4), 481–497.

Colander, D. (1999). MD dialogue: Conversations with James Tobin and Robert Shiller on the 'Yale tradition' in macroeconomics. *Macroeconomic Dynamics, 3*(1), 116–143.

Crotty, J. (1990). Owner-management conflict and financial theories of investment instability: A critical assessment of Keynes, Minsky, and Tobin. *Journal of Post Keynesian Economics, 12*(4), 519–542.

De Long, J. B., & Summers, L. H. (1986). Is increased price flexibility stabilizing? *American Economic Review, 76*(5), 1031–1044.

Dimand, R. W. (1999). Irving Fisher and the Fisher relation: Setting the record straight. *Canadian Journal of Economics, 32*(3), 744–750.

Dimand, R. W. (2004). Minsky and Tobin on the instability of a monetary economy. In M. Lavoie & M. Seccareccia (Eds.), *Central banking in the modern world*. Cheltenham, UK, and Northampton, MA: Edward Elgar Publishing.

Dimand, R. W. (2014). *James Tobin*. London, Basingstoke and New York: Palgrave Macmillan.

Driskill, R. A., & Sheffrin, S. M. (1986). Is price flexibility destabilizing? *American Economic Review, 76*(4), 802–807.

Fisher, I. (1896) *Appreciation and interest* (Vol. 1). New York: Macmillan for the American Economic Association; (Reprinted in Fisher (1997)).

Fisher I (1926) A statistical relation between unemployment and price changes. *International labour review*, *13*(6), 785–792, Reprinted in Fisher (1997) Vol. 8, and as "Lost and found: I discovered the Phillips curve. *Journal of Political Economy*, *81*(1973), 496–502.
Fisher I (1928) *The money illusion*. New York: Adelphi; (Reprinted in Fisher (1997), Vol. 8).
Fisher I (1932) *Booms and depressions*. New York: Adelphi; (Reprinted in Fisher (1997), Vol. 10).
Fisher I (1933) The debt-deflation theory of great depressions. *Econometrica*, *1*(3), 337–57; (Reprinted in Fisher (1997), Vol. 10).
Fisher I (1997) *The Works of Irving Fisher*, 14 volumes, edited by William J. Barber assisted by Robert W. Dimand and Kevin Foster, consulting editor James Tobin, London: Pickering & Chatto.
Friedman M (1968) Presidential address: The role of monetary policy. *American Economic Review*, *58*(1), 1–17; (Reprinted in Tobin, ed. (2002)).
Hayashi, F. (1982). Tobin's marginal q and average q: A neoclassical interpretation. *Econometrica, 50,* 213–224.
Hicks J. R. (1935) A suggestion for simplifying the theory of money. *Economica* new series, *2*(1), 1–19, (Reprinted in Tobin, ed. (2002)).
Jüttner, D. J. (1987). The Wicksell-Tobin investment model. *Journal of Macroeconomics, 9,* 457–462.
Keynes, J. M. (1930). *A treatise on money, 2 volumes*. London: Macmillan.
Keynes J. M. (1936) *The general theory of employment, interest and money*. London: Macmillan.
Keynes J. M. (1937) The general theory of employment. *Quarterly Journal of Economics*, *51*, 209ff. Reprinted in Keynes (1971–89) Vol. XIV, In S. E. Harris (Eds.) (1947), *The new economics* (pp. 181–93). New York: Knopf.
Keynes J. M (1971–89) *The collected writings of John Maynard Keynes*, 30 volumes, In D. E. Moggridge & E. A. G. Robinson, volume editors E. S. Johnson and D. E. Moggridge, London: Macmillan, and New York: Cambridge University Press, for the Royal Economic Society.
Lerner, A. P. (1940). *The economics of control*. New York: Macmillan.
Lucas, R. E., Jr. (1981a). *Studies in business cycle theory*. Cambridge, MA: Oxford, Basil Blackwell, MIT Press.
Lucas, R. E., Jr. (1981b). Tobin on monetarism: A review article. *Journal of Economic Literature, 19*(2), 558–567.
Markowitz H (1952) Portfolio selection. *Journal of finance*, *7*(1), 77–91 (Reprinted in Tobin, ed. (2002)).
Markowitz, H. (1959). *Portfolio selection*. New York: Wiley for the Cowles Foundation for Research. in Economics.
Minsky, H. P. (1975). *John Maynard Keynes*. New York: Columbia University Press.
Minsky, H. P. (1981). James Tobin's *Asset accumulation and economic activity*: A review article. *Eastern Economic Journal, 7*(3), 199–209.
Minsky, H. P. (1982). *Can "IT" happen again? and other essays on instability and finance*. Armonk, NY: M. E. Sharpe.
Minsky, H. P. (1986). *Stabilizing an unstable economy*. New Haven, CT: Yale University Press for the Twentieth Century Fund.
Mishkin, F. S. (1983). *A rational expectations approach to macroeconometrics: Testing policy ineffectiveness and efficient-market models*. Chicago: University of Chicago Press.
Myrdal G (1939) *Monetary equilibrium* (R. B. Bryce & N. Stolper, Trans.) Glasgow: William Hodge; (Reprinted New York: Augustus M. Kelley, Reprints of Economic Classics, 1965).
Patinkin, D. (1965). *Money, interest and prices* (2nd ed.). New York: Harper & Row.
Palley, T. I. (2008). Keynesian models of recession and depression revisited. *Journal of Economic Behavior & Organization, 68*(2), 167–177.
Rogers, C. (1989). *Money, interest and capital*. Cambridge, UK: Cambridge University Press.
Rymes, T. K. (Ed.). (1987). *Keynes's lectures, 1932–35: Notes of students*. Ottawa: Department of Economics, Carleton University.
Rymes T. K. ed. (1989) *Keynes's lectures, 1932–35: Notes of a representative student*, London and Basingstoke: Macmillan, and Ann Arbor: University of Michigan Press.

Schmidt, K. J. W. (1995). "Tobin's q? Myrdal's Q! Ein Fallbeispiel für den Wert von Fremdsprachenkenntnissen" [Tobin's q? Myrdal's Q! An Example of the Value of Knowing Foreign Languages]. *Kredit und Kapital, 28,* 175–200.

Shiller, R. J. (1999). The ET interview: Professor James Tobin. *Econometric Theory, 15,* 867–900.

Shiller R. J. (2000) *Irrational exuberance* (2nd ed.). Princeton, NJ: Princeton University Press (2005).

Shoup, C., Friedman, M., & Mack, R. P. (1943). *Taxing to prevent inflation*. New York: Columbia University Press.

Tobin, J. (1941). A note on the money wage problem. *Quarterly Journal of Economics, 55,* 508–516.

Tobin, J. (1958). Liquidity preference as behavior towards risk. *Review of Economic Studies, 25*(1), 65–86.

Tobin, J. (1959). On the predictive power of consumer intentions and attitudes. *Review of Economics and Statistics, 41*(1), 1–11.

Tobin, J. (1969). A general equilibrium approach to monetary theory. *Journal of Money, Credit, and Banking, 1*(1), 15–29.

Tobin, J. (1971). *Essays in economics* (Vol. 1). Amsterdam: North-Holland.

Tobin, J. (1975). A Keynesian model of recession and depression. *American Economic Review: AEA Papers and Proceedings, 65*(2), 195–202.

Tobin, J., & Brainard, W. C. (1977). Asset markets and the cost of capital. In R. Nelson & B. Balassa (Eds.), *Economic progress, private values, and public policy: Essays in honor of William Fellner* (pp. 235–262). Amsterdam: North-Holland.

Tobin J (1978) A proposal for international monetary reform. *Eastern Economic Journal*, *4*(3–4), 153–159; Reprinted in *Eastern Economic Journal*, *29*(4), 519–526.

Tobin J (1980a) *Asset accumulation and economic activity*. Oxford, Chicago: University of Chicago Press, Blackwell.

Tobin, J. (1980b). The overlapping generations model of fiat money: Discussion. In J. H. Kareken & N. Wallace (Eds.), *Models of monetary economies*. minneapolis, MN: Federal Reserve Bank of Minneapolis.

Tobin, J. (1983). Liquidity preference, separation and asset pricing. *Zeitschrift für Betriebswirthschaft, 53*(3), 236–238.

Tobin, J. (1984a). On the efficiency of the financial system. *Lloyds Bank Review, 153,* 1–15.

Tobin, J. (1984b). A mean-variance approach to fundamental valuations. *Journal of Portfolio Management, 20,* 26–32.

Tobin, J. (1987a). Irving Fisher. In J. Eatwell, M. Milgate, & P. Newman (Eds.), *The new palgrave: A dictionary of economics*. London: Palgrave Macmillan.

Tobin, J. (1987b). 'Microfoundations' and the impasse in macroeconomics. *Mathematical Social Sciences, 14,* 195–198.

Tobin, J. (1989). Review of *Stabilizing an unstable economy*, by Hyman P. Minsky. *Journal of Economic Literature, 27*(1), 105–108.

Tobin, J., & Brainard, W. C. (1990). On Crotty's critique of q theory. *Journal of Post Keynesian Economics, 12*(4), 543–549.

Tobin, J. (1992). An old Keynesian counterattacks. *Eastern Economic Journal, 18*(4), 387–400.

Tobin, J. (1993). Price flexibility and output stability: An old Keynesian view. *Journal of Economic Perspectives, 7*(1), 45–65.

Tobin J. (1997) An overview of the general theory. In G. C. Harcourt & P. A. Riach (Eds.), *A "Second Edition" of the general theory* (Vol. 2, pp. 3–27). London and New York: Routledge.

Tobin, J., & Golub, S. S. (1998). *Money, credit, and capital*. Boston: Irwin McGraw-Hill.

Tobin, J. (Ed.). (2002). *Landmark papers in macroeconomics selected by James Tobin*. MA, Cheltenham, UK, Northampton: Edward Elgar Publishing.

Tobin J. (2003) *World finance and economic stability: Selected essays of James Tobin*, with a foreword by J. Yellen, Cheltenham, UK, and Northampton, MA: Edward Elgar Publishing.

Wicksell K. ([1898] 1936), *Interest and prices* (R. F. Kahn with introduction by B. Ohlin, Trans.). London: Macmillan.