

Uncertainty and inequality in early financial thought: John Hicks as a reader of Knight and Keynes

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The article examines the early reception of Knight's and Keynes' accounts of uncertainty and their overlooked role in the development of financial economics. Knight's famous distinction between risk and uncertainty bore a deep social and political significance, dividing humanity into risk-takers and the risk-averse. This same distinction, I argue, along with its asymmetries of power and rewards, was reproduced in Hicks' 1939 dynamic equilibrium model. It was recast as an opposition between hedgers and speculators in a market for risk, on the one hand, and between institutional investors and the general public, on the other. Hicks's synthesis heeds both Knightian and Keynesian notions of uncertainty, adopting the former's idea of profit-earning uncertainty-bearers and the latter's definition of money as an imperfect though widely used hedge against uncertainty. Closer to Knight than to Keynes, Hicks's model raises a fundamental political question: is inequality a price worth paying for greater certainty in economic life?

Key words: Risk and Uncertainty, Money and Interest, Inequality, Liquidity, Financialization

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1. Introduction

An 1867 *Economist* article titled 'Why the Number of Good Investments is so Small' offered readers an original investment strategy. Insurers, it claimed, will increase the price of their premiums with increasing risk, extending and diversifying their pool to increase safety. 'Why', it asks, 'cannot this be done in finance?' ([The Economist](#),

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1867, 1408). *All* investments, it claimed, can become much safer by charging an extra premium for risk and setting it aside ‘as an insurance fund’. And yet, this was hardly common practice. ‘The fact is’, complained the author,

that there is a real pleasure to the mind in slight pecuniary danger. It has the character of gambling and the delight of gambling... and while vanity, a craving for excitement, and a sanguine disposition run deep into mankind, good investments will always be few, because, upon all but the very unsafe ones, the return made and the return required is not enough to create a reserve fund, by which danger may be met when it arrives. (ibid.)

For over a century since, the innate tension between the ‘reserve fund’, profit, and speculative human nature has defined the ‘risk premium’ and its primary institutional and theoretical context: the financial system. The past decades have seen a broad transformation of financial markets, recast as markets for risk. This article joins others in exploring the role that risk and uncertainty have played in explaining, and legitimising, financial profits in this new constellation (Mackenzie, 2006; Mehrling, 2010; Ascher, 2016), focusing on their implications for the question of social inequality.

Though it is highly prevalent throughout the financial system, I will argue, risk remains an ambiguous justification for profit. As the *Economist* observed, a tacit conflict persists not only between irrational risk-taking and the profit motive but between two different conceptions of the ‘risk premium’ itself. One approach takes risk, financial or otherwise, as actuarial. The risk premium, in this view, reflects our most complete knowledge of possible hazards so that an insurer may calculate the reserves needed to meet future losses. The other approach, however, focuses on human psychology. Since risk is both inevitable and, for most, highly undesirable, risk-takers must be lured and handsomely compensated. To properly price risk, therefore, this approach calls for a science of human greed and fear, rather than the prediction of economic trends.

The tension between insurable risk and the speculative world of decisions under uncertainty was a central motivating problem in Frank Knight’s (1921) *Risk, Uncertainty, and Profit*. Though many have focused on Knight’s novel idea of uncertainty, it is the vision of an economics science that tackles *both* risk *and* uncertainty that makes his work such an important precursor of later debates, especially in the burgeoning field of financial economics. Knight, moreover, was unique in studying risk and uncertainty with an eye to their social impact, from the distribution of wealth to social divisions and hierarchies.

In what follows, I argue that Knight’s solution to uncertainty—an elaborate mechanics of risk coupled with a psychological theory of the entrepreneur—reemerged in 1930s debates on economic dynamics. The Knightian entrepreneur had morphed into a financial speculator in the ongoing intellectual exchange between John Hicks and John Maynard Keynes. I further show how the epistemological disagreements between the two on the nature of risk and uncertainty add up to a more substantive disagreement on the role of money and the price the public must pay for safety. Hicks, who saw institutional investors as the main price-setters of the interest rate, largely replicated Knight’s conclusion that inequality and market concentration are the necessary social costs of uncertainty. For Keynes, on the other hand, the price of money, and therefore access to money, was determined by the public, or the market at large, and by the central monetary authority, offering a true alternative.

2. Knight and the distinction of risk and uncertainty

In *Risk, Uncertainty, and Profit*, Frank Knight established his now famed distinction between risk and uncertainty. While risks referred to calculable (some have argued, insurable) future-event probabilities, uncertainty described outcomes that were inherently unpredictable or ‘non-classifiable’ (Knight, 1921, 233; see also LeRoy and Singell, 1987; Lawson, 1988; Langlois and Cosgel, 1993). Knight is best known for his claim that uncertainty was incompatible with equilibrium analysis, and therefore exposed the model’s real limits. And yet, an even more influential Knightian idea was his parallel, less celebrated claim, that *risks* were perfectly compatible with equilibrium. In part through Hicks’s direct transmission, as I will show, calculable risks would become a regular component of equilibrium analysis in its postwar formalisation (Arrow, 1964), while the lessons of uncertainty were mostly cast aside (Blaug, 1985, 462–63). In light of Knight’s mixed reception, the distinction itself now merits re-examination, as the juxtaposition of risk and uncertainty, or the claim that economic theory must provide an account of both.

The Knightian social world was overrun with uncertainty. Uncertainty drove humans to collaborate with each other, forced economic activity into more rational and efficient forms of organisation, and centralised society’s ‘command functions’—its decision-making and leadership roles (Knight, 1921, 244–45). In other words, a large part of socio-economic organisation was dedicated to translating uncertainty into risk—a task that Knight saw as far from futile. He spent a significant portion of his book detailing the various ways we consolidate, diffuse, predict, and otherwise mitigate the effects of uncertainty, constantly improving on our techniques of forecasting and control (256). Crucially, Knight also rejected the views of contemporaries like John Bates Clark (1902), who argued that dynamic change remained beyond the purview of equilibrium analysis. Instead, he pointed to a host of tools and arrangements, from insurance to interest rates and the modern firm, which render a dynamic and changing environment compatible with equilibrium.

Knight’s distinction not only established uncertainty as equilibrium defying, therefore, but was crucial in integrating risk into neoclassical analysis. This was also where Knight’s distinction assumed its wide-reaching social and political significance. Mechanical equilibrium in some spheres of human action, Knight argued, required a social division of labour that would be maintained by specific institutions. For the many to live a routinised, mechanically efficient life despite dynamic changes—the life predicted by neoclassical models—some would have to ‘bear’ any remaining uncertainties (Knight, 1921, 268; Hirsch, forthcoming). These were the entrepreneurs. They led firms and businesses, took responsibility for their success or failure, and offered workers and capitalists predetermined, guaranteed payments for their own contributions. Their unique form of compensation for this service were profits—an uncertain and unpredictable surplus above costs that was potentially limitless in scope.

In the 1930s, the problem of money and financial markets set the stage for a renewed discussion of the meaning of risk and uncertainty, against the backdrop of financial collapse and a global depression. While Knight’s discussion of uncertainty focused on the transformation of the modern firm at the turn of the twentieth century (Knight, 1921, 289), a common theme, particularly among institutionalist economists (Fiorito, 2013; Sawyer, 2018), this later conversation was motivated by the interwar concern with business cycles and financial stability (Morgan, 1992; Bateman, 1996; Laidler,

1999). Both had turned on the static assumptions of the equilibrium model and on its hollowed-out human agents, which no longer fit the organisational complexity of business life, nor its flux and dynamism.

In his first of two reviews of Keynes's *General Theory*, Hicks credited its author with ushering this intellectual reconfiguration around dynamics. 'Ordinary (static) economic theory', he summarised,

explains to us the working of the economic system in 'normal' conditions. Booms and slumps, however, are deviations from this norm... the present theory breaks away from the whole of this range of ideas. It is no longer allowed that ordinary economic theory can give a correct analysis of even normal conditions... The changing, progressing, fluctuating economy has to be studied on its own. (Hicks, 1936, 239)

Hicks's own book, *Value and Capital* (1939), was devoted to adapting the equilibrium model to new dynamic concerns (Hicks, 1939, 116).¹ And yet, Hicks and Keynes represent divergent paths on the central question of risk, uncertainty, and their distinction.

As Perry Mehrling (2010) has suggested, Hicks and Keynes fall on either side of a larger divide among twentieth-century economists on the measurability of uncertainty. Keynes, he proposes, like Knight and Irving Fisher, rejected the prospect of applying (objective, numeric, eventually even non-numeric) probabilities in cases of true uncertainty. Hicks, on the other hand, along with Jacob Marschak, Kenneth Arrow, and their successors, accepted the broad use of risk and probabilities, giving rise to a 'monetary Walrasianism', where uncertainty is all but eliminated (Mehrling, 2011, 60; see also Culham, 2020, 498). These claims, however, require some modification. Though Hicks and Keynes offer very different definitions of risk and uncertainty, as I will show, they both maintain a generative distinction between the two, leading to a similar assessment of the social costs of uncertainty. Where their main epistemological differences resurface is in their proposed solutions, drawn from the realm of money and finance.

3. Keynes: uncertainty and probability

Keynes began his career rejecting the Benthamite moral calculus—the numerical representation of future prospects and their value—and ended it by embracing the pervasive, highly disruptive role of uncertainty in economic life (Lawson, 1985; Bateman, 1996; Minsky, 2008). His most well-known statement to this effect appeared in a 1937 symposium on the *General Theory*. It claimed that some of the most important events for economic decision making—'the prospect of a European war... the rate of interest twenty years hence, or the obsolescence of a new technology'—categorically resisted any kind of predictive method (Keynes, 1937b, 214). While it is common for 'uncertainty' to refer to any situation in which we lack complete certainty—that is, in situations that call for probabilities—Keynes, like Knight, designated the term 'uncertainty' for that which 'we simply do not know' (ibid.; Lawson, 1988).

The more interesting aspect of Keynes's view of uncertainty, however, is its counterpart: that which is neither certain nor uncertain; the realm where probabilities and

¹ In an unpublished 1932 draft, Hicks credits Knight and Friedrich Hayek for (independently) developing a temporally-sensitive equilibrium model (Hicks, 1973, 4).

expectations *do* matter. It is here, in Keynes's evolving view of probabilities and his rejection of what Knight, and later Hicks, called 'risk', that their most important differences emerge, both epistemologically and politically. Uncertainty and the technical, institutional, and social means to answer it look very different, I propose, whether or not one accepts the validity of an actuarial, numerically represented risk.

Keynes made little use of the term 'risk' in his early accounts of probability (with one notable exception). He was also sceptical that risk-mitigating technologies, least of all insurance, were founded on a scientific, fully rational basis. 'Probabilities', in his system, didn't stand for frequencies of events in the external world, but for a logical relation between a proposition and the evidence it was based on. This relation dictated the confidence one should have in this proposition being true (TP, 11; Lawson, 1985, 911; Gillis, 2006, 206). Most probabilities, moreover, could not be captured with numbers on a single, comparative scale. At most, one could estimate the relative value of one probability over another. That, Keynes argued, was what insurers usually did. 'Underwriters', he explained,

are actually willing... to name a numerical measure in every case, and to back their opinion with money. But this practice shows no more than that many probabilities are greater or less than some numerical measure, not that they themselves are numerically definite. (TP, 23–4)

Keynes was equally motivated by moral reservations. The 'Benthamite calculus', he argued, balancing consequences both near and remote, was not only epistemologically implausible but ethically deficient (TP, 353). The consequences of our actions, he claimed, and particularly the 'good' they entailed, are rarely known (*ibid.* 355). More importantly, probabilities misrepresented not only the fact but the *cost* of uncertainty. They ignored, he wrote, 'the element of "risk" and [assumed] that an even chance of heaven or hell is precisely as much to be desired as the certain attainment of a state of mediocrity' (*ibid.* 356). The only substantive use Keynes does make of the term risk, therefore—and numerical risk at that—is as a measure of the 'pain' of losing.²

Yet despite these reservations, which only grew with the years, as Keynes abandoned 'objective probabilities', his economics consistently maintained a central place for objective knowledge and coherent, orderly behaviour among economic actors (Lawson, 1985; Bateman, 1996; Gillis, 2006). Even more surprising, as Bradley Bateman has shown, was the resilience of Keynes's belief in 'intelligent anticipations', given his one-time adherence to the Cambridge business cycle tradition, which regarded expectations as subjective and unruly—the primary, exogenous movers of the business cycle (Bateman, 1996, 81–82). Aside from extreme breaks, such as war, Keynes argued, economic actors in the normal course of events were successfully 'calculating on a probability'. They were not only rational and generally accurate in their estimates, but highly sensitive to even small changes in present conditions and prices, especially to government price signals (88–90).

It was only in the *General Theory* and its aftermath that Keynes came fully to embrace a view of the uncertainty as an overwhelming, disequilibrating force (Shackle,

² The real cost of losing refers not to the stake to be lost—the fair price of the wager—but the likelihood of actually losing that stake—the fair price multiplied by the likelihood of losing the wager. Keynes offers this formula, on the model of reinsurance: 'If A is the amount of good which may result, *p* its probability ($p + q = 1$), and E the value of "mathematical expectation," so that $E = pA$, then the "risk" is R, where $R = p(A - E) = p(1 - p)A = pqA = qE...$ ' He explains that 'E measures the net immediate sacrifice which should be made in the hopes of obtaining A; *q* is the probability that this sacrifice will be made in vain; so that *qE* is the "risk"' (TP, 348).

1961; Minsky, 2008). Even here, however, Keynes points to heuristics and conventions that allow for some degree of orderly and coherent market conduct (Lawson, 1985; Patinkin, 1990). Keynes is known for his harsh critique of our ‘marketplace idols’: unfounded projections from the past onto an unknown future, an overreliance on public opinion, and a focus on anticipating the moves of others rather than estimating underlying values (Keynes, 1937b, 214–15). But he also held that such convention-based conduct is capable of maintaining order through its power to coordinate social behaviour (Lawson, 1985, 221). Rather than an objective view of probabilities, or a fully subjective one, Keynes offered a form of intersubjective probability, or strategic groupthink (Gillis, 2006, 214–15).

Another important heuristic Keynes accepts are ‘equivalent certainties’, where actual probabilities are wanting (Bateman, 1996, 132–33). This idea speaks to the practical value of thinking with probabilities, even when there is no objective basis for determining them. Much like the ‘underwriters’ of the TP, the ‘entrepreneur, who has to reach a practical decision as to his scale of production, does not, of course, entertain a single undoubting expectation of what the sale-proceeds of a given output will be, but several hypothetical expectations held with varying degrees of probability and definiteness’ (GT, 24, n. 3). This bundle is equivalent to one held with certainty if both ‘lead to the same behaviour’ (ibid.).

To what extent therefore can we speak of a Keynesian distinction between risk and uncertainty? Keynes explicitly rejected numerical probabilities and the wide application of actuarial principles—with their presumption of universal predictability—to markets and economic policy. In that sense, he lacks a distinction between *risk* and uncertainty. But Keynes is not, for that, inconsequential for the persistent afterlife of Knight’s distinction. He clearly separated uncertainty from non-numeric or subjective probabilities; our inability to predict the future from the institutions and conventions set up to maintain order. Not only his ‘equivalent certainties’ would become crucial for Hicks, but his account of futures trading, capital markets, and the liquidity preference. In all these fields, what primarily distinguished Keynes from Knight and from Hicks wasn’t his rejection of numerical probabilities but the role he gave the public and its representatives in creating a more stable economic environment—a role rooted in his conventionalist view of probabilities.

4. Hicks: risk without uncertainty?

John Hicks’s first attempt to define risk and uncertainty appears in his review of Knight. Profit, Hicks agreed, was inherently linked to uncertainty, but, he added, one hardly needed to accept Knight’s immeasurable or ‘true uncertainties’ to reach this conclusion. Unlike Knight and Keynes, Hicks spoke of uncertainty in the colloquial sense, as the absence of certainty, or any situation where probabilities are called for. Moreover, most uncertain situations, he believed, *could* be sufficiently classified and grouped together to be represented, numerically, as probabilities (Hicks, 1931, 171).

But Hicks’s account not only avoided Knight’s and Keynes’s more radical view of uncertainty. It also challenged Knight’s uncompromising faith in ‘risk consolidation’ using the tools of actuaries or the structure of the modern firm. Though Hicks pointed to various institutional solutions to risk, most importantly the fixed-remuneration mechanism, alongside insurance and speculation (Hicks, 1931, 176), he insisted that he spoke only of “reduction” of risks, and not, as Professor Knight sometimes does, of “elimination” (Hicks, 1931, 175 n. 5).

For this reason, I propose to see Hicks's position as distinct from those of Knight and Keynes, but also beholden to them. Unlike Keynes, Hicks clearly subscribes to a view of risk as measurable, manageable, and even tractable, consistent with equilibrium analysis, albeit in somewhat qualified measure. But Hicks, as I will show, also held on to a view of uncertainty that was more destabilising and economically significant than his earlier piece had conveyed. He should, therefore, be seen as reviving a Knightian *distinction* between risk and uncertainty in ways that, while different, will lead to a similar set of conclusions concerning the institutions that modern societies set up to increase stability.

In *Value and Capital*, Hicks's (1939) concept of 'risk' takes the form of Keynes's 'equivalent certainties'. 'Supplies (and eventually demands too)', he argued, as against the static assumptions of neoclassicism, 'are governed by expected prices quite as much as by current prices' (117). Expectations don't usually take the form of a definite price, but rather a range of possibilities, each with its own likelihood, inspiring varying degrees of doubt and confidence. They combine objective opinions about facts, expressed as probabilities, and a psychological, subjective attitude towards risk, which gives diverse interpretations to these probabilities (125–6).

The main difference between Hicks and Keynes on this matter, was that Hicks had little qualms about expressing both the subjective and the objective sides of expectations numerically. 'We shall formally assume', he wrote, 'that people expect particular definite prices... but we shall be prepared on occasion to interpret these certain expectations as being those particular figures which best represent the uncertain expectations of reality' (126). To produce a definite price expectation, one needed to identify the most likely outcome and add to it 'an allowance for risk', a range of possible outcomes. 'It is convenient', he explained, 'to represent these probabilities to oneself, in a statistical fashion, by a mean value, and some appropriate measure of dispersion' (Hicks, 1935, 8). The 'risk-allowance' would also represent subjective elements, like risk-aversion or low confidence, by slightly moving the expected price in an adverse direction. 'An analysis in which we suppose people to have precise expectations of prices', Hicks concluded, was 'not altogether incompetent for dealing with a world in which risk is supremely important' (Hicks, 1939, 126).

Though Hicks and Keynes diverged on the possibility of measuring risk, they nonetheless tended to agree on the wider problem of uncertainty. Uncertainty, in Hicks's account, could be masked and repackaged as definite-looking numbers. Its *effects*, however, could not. We can accurately reflect expectations as part of present-day decisions, but we cannot thereby prevent the harmful effects of failed expectations in the future. Like Keynes, therefore, Hicks agreed that uncertainty can become very costly, leading to market disequilibrium as 'expectations are cheated, and plans go astray' (Hicks, 1939, 132).

Unmet expectations, for Hicks, created four kinds of disequilibrium. The first two concerned coordination. Different expectations about the future could come into conflict, while future plans may simply be inconsistent (even if expectations are accurate) (Hicks, 1939, 133). Another kind of disequilibrium was caused by an error in judgment, when human and corporate actors miscalculated their future needs or capabilities. Finally, the fourth disequilibrium was caused by the truly unpredictable: by unexpected events and, more importantly, by our anticipation of unexpected events. Doubt, a permanent feature of society, can bring about disequilibrium even when predictions are accurate, precisely because 'when risk is present... people will generally

act, not upon the price which they expect as most probable, but as if that price had been shifted a little in a direction unfavourable to them' (ibid. 134). The third and fourth types of disequilibrium, Hicks argued, were an *irreducible* effect of uncertainty and existed in any economy and any society. They thus posed insurmountable obstacles for any market solution to uncertainty.

5. Hedgers, speculators, and the risk premium

Borrowing directly from Keynes's *Treatise on Money*, Hicks explored possible market answers to uncertainty using a real-life future-oriented market: the commodities exchange. With its 'forward' and 'futures' contracts,³ this early and expansive derivatives market was premised on the present-day coordination of future exchange. In a hypothetical, 'pure' forward economy, therefore, actors would use forward contracts to settle all future transactions in the present, coordinating their plans and expectations without the need for centralised economic planning. All prices and payments would be determined in advance. In this scenario, Hicks claimed, the first two types of disequilibrium will be completely eliminated (Hicks, 1939, 136).

This perfect forward economy, however, is still vulnerable to the third and fourth types of disequilibrium. When a future promise cannot be met due to unforeseen changes, the indebted party must procure alternative means, and will therefore give rise to a 'spot market,' where assets can be traded in the present. That is precisely what happens in real markets, where forward prices live alongside spot prices and are, moreover, significantly different from them. This mismatch stands at the heart of Keynes's explanation of forward trading and Hicks's broader mechanics of market risk management.

The regular gap that forms between a forward and a spot rate, as Keynes had originally argued, discloses a peculiar fact about the forward market: namely that it is comprised of two kinds of actors, with opposite roles. The first group are the 'hedgers': actors with real-world economic stakes, producers or wholesalers, for example, who enter these markets in order to offset real-world price risk. They are willing to pay for the benefit of avoiding dramatic losses. The second group are the speculators: market actors with no stake in the 'real' economy. These actors would not be trading in future promises at all if it weren't for the expectation to earn a profit from the trade itself. 'The spot price', therefore, 'must exceed the forward price by the amount which the producer is ready to sacrifice in order to "hedge" himself, i.e. to avoid the risk of price fluctuations during his production period' (ToM, 128; Hicks, 1939, 138; see also, Fantacci et al., 2014, 1103).⁴

Following Keynes, Hicks argued that a regular asymmetry between supply and demand for risk made speculators necessary. Hedgers, he argued, were more likely to 'hedge planned sales', since 'technical conditions give the entrepreneur a much freer

³ The forward contract is a bilateral agreement that determines the date, price and quantities of a commodity to be traded, and can be exchanged in the open market or in private. Exchange-traded forward contracts are called 'futures contracts.'

⁴ At the time Keynes was writing, 'hedgers' were hardly a theoretical abstraction. A Federal Trade Commission *Report on the Grain Trade* (1920) showed that roughly fifty percent of all grain elevators in the American Midwest reported hedging in the Futures Exchange (usually the Chicago Board of Trade). In some states, such as North Dakota, the number was closer to ninety-five percent and some reported that their insurers or lenders required hedging (FTC, 1920, 216). Nevertheless, most futures transactions were completely speculative, with 'paper trades' far exceeding those settled in actual delivery (Levy, 2012, 238–39).

hand about the acquisition of inputs... than about completion of outputs' (Hicks, 1939, 137).⁵ Speculators were therefore necessary for setting up a two-way market. Like the Knightian entrepreneur, whose promises, in the form of contractually guaranteed remuneration, make markets in labour and in capital (Knight, 1921, 269–70), the speculator creates and maintains markets in various commodities (sustaining both lending and production) by removing the uncertainties that attach to their future sale.

Moreover, by creating speculative demand for various types of forward contracts, speculators, Hicks argued, help reduce the spread between forward and spot prices, keeping the cost of risk more stable and reasonable. The persistence of a spread despite this balancing, corrective influence, was, he added, further proof that the risk-premium was not only acceptable to natural hedgers but required in order to guarantee sufficient numbers of speculators (Hicks, 1939, 138). In this way, the speculator's spread assumes the form of a Knightian profit: while hedgers gain certainty at a predetermined cost, the selling price of their goods, for example, the speculator's remuneration is determined only in hindsight and can fluctuate significantly. By this logic, a more accurate name would be the 'uncertainty premium'.⁶

Importantly, just as in Knight's theory, the 'specialisation' of uncertainty-bearing does not eliminate uncertainty but concentrates its greater costs in far fewer hands. Knight's entrepreneur made the kind of decisions most were spared; decisions that implicated her and her alone in market outcomes. The speculator-hedger dyad worked in a somewhat different way, but to the same effect: a fundamental division of market actors. The market became an encounter of opposites: those driven by 'fear', or at least those who had something to lose, and those driven by uncertain profits. The speculator, however, had greater access to insurance-like risk-mitigating tools, such as a diversified portfolio and multiple, at times offsetting, simultaneous transactions. This fact will become important for Hicks, who generalised his account of speculators to the financially-integrated economy.

6. Money and interest

As shown above, Hicks and Keynes were divided in their views on risk, probabilities, and uncertainty but shared a foundational concern with the disequilibrating nature of doubt and expectation. They also shared a vision of individual risk 'specialisation', in Knight's language, as a possible remedy. In this section, I explore the theoretical, social, and political significance of their remaining differences. In particular, I focus on Hicks and Keynes's competing views on money and interest both as exacerbating factors for uncertainty and as potential solutions. Though Keynes provides Hicks with the main building blocks of his theory, the latter's conclusions significantly diverge from his, on three main points: the liquidity preference, the price of money, and risk management.

These differences, I will further argue, underscore a more substantial ideological and political divide. Hicks's account identifies risk-taking as a unique social activity

⁵ As Keynes and others have shown, this assumption is only true under regular economic conditions, while downturns are often characterised by the reverse asymmetry, though an asymmetry nonetheless (ToM 128; Kaldor, 1939; Dow, 1940).

⁶ Notably, Knight had anticipated Hicks's move, not only arguing that the 'most important instrument in modern economic society for the specialisation of uncertainty, after the institution of free enterprise itself, is *Speculation*' (Knight, 1921, 255) but pointing specifically to the 'hedging contract' as a form of 'risk specialisation,' analogous to the entrepreneurial function.

that, like Knightian entrepreneurship, merits a deeply skewed system of rewards and drives market concentration. The underlying claim was that the price of risk and the price of money—an important hedge against uncertainty for the greater public—were set by powerful private actors. In contrast, Keynes's theory of money retained a central role for the monetary authority and the public at large.

6.1 *The liquidity preference*

Money and interest, for Keynes as for Hicks, served as a site of reflection on the role of uncertainty and expectation in economic life. All too often treated as a 'veil', a neutral medium of exchange, money was hoarded and held on to in real life, in ways that defied neoclassical explanation. It posed a fundamental puzzle: why did people regularly make the seemingly irrational, sub-optimal decision to keep their wealth in a 'barren' asset? Keynes famously answered that the demand for money was rooted in our 'liquidity preference'—the desire to hold money for its own sake, for the 'convenience of holding assets in the same standard as that in which future liabilities may fall due' (GT, 236–7) or, more broadly, as a 'general command over purchasing power' (GT 167 n. 1, see also Culham, 2020, 497).

Though debates are ongoing as to the precise meaning of liquidity, and the liquidity of money in particular, it is generally seen as a safeguard against future contingencies, changing expectations, and uncertainty more broadly (Runde, 1998; Hayes, 2018; Culham, 2020). 'Our desire to hold Money as a store of wealth', Keynes wrote, 'is a barometer of the degree of our distrust of our own calculations and conventions concerning the future... the possession of actual money lulls our disquietude' (Keynes, 1937b, 216). Liquid assets are liquid, as Keynes defines them, for being 'more certainly realisable at short notice without loss' (ToM, 59). Money thus sets the standard of liquidity as a direct means of payment and debt servicing with a minimum of added and unexpected costs.⁷

Keynes names several competing motives for the liquidity preference, two of which directly concern uncertainty (GT, 195; ToM, 223). Aside from a 'transactions motive', servicing *known* lags between expenditures and receipts, he contrasts a 'precautionary' motive with a 'speculative' one. The precautionary motive speaks to the money we hold to face unpredictable future expenditures and to our general confidence in markets. Money, in this case, acts as a form of widely accessible, though mostly imprecise hedge against that which we 'simply do not know'. The speculative motive, on the other hand, speaks to our profit-oriented cash holdings. Speculation reflects our uncertainty about future prices, but it is an uncertainty that can be exploited for gain (Bibow, 1998), prompting various probability calculations (GT, 169; see also Runde, 1994, 134; Culham, 2020, 493). Speculation is further defined by the opposition of 'bullish' and 'bearish' sentiments—the sense that securities and capital assets are undervalued or overvalued, respectively.

The division of labour between the speculative and the precautionary motive—mirroring Keynes's distinction between probabilities and uncertainty—reveals, as Culham shows, the *institutional* assumptions behind Keynesian liquidity. 'In the

⁷ Keynes's ToM definition of liquidity, which he applies to the full spectrum of financial assets, with their relative liquidities, measures liquidity along three axes: the (1) certainty and (2) speed with which an asset can be exercised, relative to the (3) percentage face value it can preserve (Beggs, 2015, 15; Hicks, 1962, 793–94).

absence of an organised market', Keynes argued, 'liquidity-preference due to the precautionary-motive would be greatly increased' (GT, 170). What allows assets involving high risk and uncertainty to remain liquid, marketable, and shiftable (i.e. saleable on secondary markets, primarily to larger financial intermediaries) is the existence of liquid markets with enough buyers and sellers to guarantee easy, though hardly costless, exchange.⁸ Doubts about the availability of liquid markets, therefore, will exacerbate precautionary demand (Culham, 2020, 497). Completing this institutional context is the centralised banking system, where the availability of cash, securities, and advances depends on monetary policy but also on bankers' own liquidity preferences (with an eye to their liabilities and the *institutional* risks they impose) (Beggs, 2015, 17–18; Keynes, 1937a, 666).⁹

Combined, the liquidity preference and the institutional context in which money, securities, and assets are traded form the basis for Keynes's novel approach to the interest rate. If money is what we keep for our peace of mind, the interest rate is 'the premium which we require to make us part with money' and 'the measure of the degree of our disquietude' (216). Interest, Keynes argued, was 'the inducement *not* to hoard' (210, see also GT 174), 'the factor which adjusts at the margin the demand for hoards to the supply of hoards' (Keynes, 1937b, 217). With that, he rejected the 'orthodox' notion of interest as a reward for 'waiting' or abstinence or the equilibrium of saving and investment.

For Keynes, the speculative and the precautionary motives set the price of money (under a given supply), over above the base transactions needs of the economy. The precautionary motive sets interest at the threshold of collective confidence and the speculative motive sets interest at the equilibrium of bearish and bullish sentiment (GT, 171). By setting the interest rate, therefore, the public's 'liquidity preference' was one of the key mechanisms transmitting the effects of uncertainty into market prices and behaviours. Interest was partly responsible for the 'marginal efficiency of capital' and with it, the general rate of investment on which 'the level of output and employment as a whole depends' (*ibid.*, 221). Collective confidence and doubt thus bore deep marks on the macroeconomic system as a whole. They would ultimately determine whether it reached equilibrium at an optimal or suboptimal level of investment and, crucially, employment.

In contrast, Hicks asked to qualify the central role of uncertainty. Though he endorsed Keynes's approach to interest and money (1935, 3), the latter's liquidity preference, he argued, is 'misnamed.' It makes "the demand for money depend on Uncertainty, not Liquidity" (Hicks 1973, 11). "The Liquidity motive, properly so called", Hicks added, 'is that which makes a cat leave the room when the door is opened, even if she has been quite comfortable inside'. The essence of liquidity, for Hicks, the 'moneyness' of money, was its convertibility: the sheer facility of offloading one's position, the seamless, costless exit it affords, and its wide acceptability.¹⁰

⁸ Market liquidity doesn't remove price uncertainty, only uncertainty about altogether salability. For this reason, liquid markets are particularly important for enabling regular transactions in highly volatile assets (Culham, 2020, 497).

⁹ The topic, as Beggs shows, provided much of the context for Keynes's account in ToM, was bracketed temporarily in GT, but returned once more in the debates surrounding GT's publication (Beggs, 2015, 19–20; see also Hicks, 1962).

¹⁰ In an otherwise scathing critique of GT and Keynes's theory of the interest rate, Knight sides with Keynes, interpreting the liquidity preference as motivated primarily by uncertainty, equating 'moneyness' with safety (Knight, 1937, 114).

But Hicks's redefinition of liquidity goes significantly further than this somewhat redundant nuance. Hicks's focus on convertibility and the diminished role of uncertainty were motivated by a far greater emphasis on transaction costs and (known, calculable) risks. In his account, Hicks largely downplayed the tradeoff between precautionary and speculative demand and wholly rejected the view that the aggregate preferences of individuals determine the rate of interest. As I show next, this was because risk and transaction costs preemptively excluded most from ever entering financial markets. The decision to hold money, securities, or assets was meaningful, he argued, on a macroeconomic level, only when taken by large institutional investors, the professional speculators.

6.2 *The price of money*

Hicks and Keynes agreed on the central role of liquidity in setting the price of money but were divided on the identity of price-setting agents. For Keynes, the 'public' was the ultimate price-setter, whose liquidity preferences determined the interest rate. Hicks, on the other hand, argued that market prices were set by a handful of very large economic actors: institutional investors, major banks and corporations, or public entities. Though Keynes distinguished the professional investor from the non-professional, therefore, it was only in Hicks's work that the distinction became socially meaningful: a Knightian division of labour between risk-taking institutional investors and the general public.

From his earliest works, Keynes set up a model investor: a professional speculator that was highly sensitive to small changes in prices—signals of wider swings to come (Bateman, 1996, 90; Marcuzzo, 2012). Speculation also accounted for the greater volume of money circulating in the system (ToM, 223–4), was the major target of monetary policy, which relied on investor sensitivity (GT, 197), and was responsible for wild price swings, driven by the kind of conventional expectations that define Keynes's later turn away from objective probabilities (Keynes, 1937b).

And yet, the interest rate, which affects everything from asset prices to income levels, employment, and the business cycle, is determined, Keynes argues, by the general public. It is a public made up of individuals running households and businesses, whose 'aggregate demand for money in given circumstances... [is] the composite result of a number of different motives' (GT 195), including, as mentioned above, transaction needs, precautionary measures, and speculation. The public's fear and confidence decide the rate of interest, under conditions set by the banking system and monetary authority. Since, as Keynes explains, 'the quantity of money is not determined by the public[,] all that the propensity of the public towards hoarding can achieve is to *determine the rate of interest* at which the aggregate desire to hoard becomes equal to the available cash' (GT 174, emphasis added). Given the interest rate's crucial importance, this 'all that it can achieve' is, of course, a significant macroeconomic factor.¹¹

In contrast, Hicks clearly distinguishes the stabilising, price-taking role of the general public from the price-setting role of institutional speculators. The public does not

¹¹ Elsewhere, Keynes makes it clear that, while professionals doubtless exist, the general public too takes part in speculation. 'In any given state of expectation,' he writes, 'there is in the minds of the public a certain potentiality towards holding cash beyond what is required by the transactions-motive or the precautionary-motive' (GT, 205).

determine the interest rate and, as I will show, does not determine the price of risk either. Household and business demand for money is inelastic, which means that, rather than shifting the interest rate, such actors are bound to adjust their own consumption and investment with changing rates (Hicks, 1939, 241). Price-setting agents in a dynamic economy with uncertainty present, Hicks reasons, are necessarily those who can best afford financial transaction costs and can offset various risks. In other words, they must be institutional, not just professional, speculators, who enjoy economies of scale.

All lending (or the buying of securities), according to Hicks, is governed by the constraints of liquidity and risk, where smaller and larger ‘lenders’ differ widely (Brillant, 2014). Large investors enjoy not only the benefits of scale in lowering transaction costs but those of diversification, two factors that prevent the general public from ever entering securities markets as speculators (Hicks, 1935, 9). The rate of interest, as Hicks shows, is thus determined by the size of the ‘marginal lender’ (i.e., the lender of the marginal dollar):

Relatively large transactions can usually be made with very little more trouble than small transactions... thus large capitalists will be tempted to buy bills much more easily than small capitalists. If the demand for loans... was low enough for it to be capable of being satisfied entirely by the largest capitalists, the rate of interest on these loans would be very low indeed, practically zero. But if it became necessary to call upon the funds of smaller capitalists, the rate might be expected to rise sharply after a point. (Hicks, 1939, 165)

The financial world, in Hicks’s account—indispensable for any model economy in which time and change are included—is populated almost exclusively by ‘large capitalists’. This group of investors, which are ‘highly sensitive’ to changes in rates and expectations, moves its holdings rapidly between securities of different liquidities and risks. Their efforts, though shrouded in uncertainty, are driven by profit, not precaution, and their aim, Hicks added, should be seen as the portfolio optimisation of aggregate returns to risk.

6.3 Risk, uncertainty, and speculation

While risk, in the sense of a ‘calculable uncertainty’, is not entirely absent from Keynes’s later works, his position on the role of money in assuaging doubt and irreducible uncertainty remains its centrepiece.¹² For Hicks, on the other hand, probability calculations are an integral part of institutional speculators’ decision to hold cash, securities, or capital assets. Keynes’s liquidity preference, he argued, oversimplified the decision problem at hand, reducing it to a binary choice between money and interest-bearing securities.¹³ In contrast, he claimed, ‘choice between assets is choice between probability distributions’ and the ‘optimum balance sheet’ (Hicks, 1973, 11), where uncertainty affects the ‘value of [the] portfolio as a whole’ (Hicks, 1962, 791).

All financial markets, in Hicks’s account, are structured like the commodities exchange, displaying two different versions of the opposition of hedgers and speculators.

¹² Speaking of the interest rate, for example, he accepts that ‘the actuarial profit or mathematical expectation of gain calculated in accordance with the existing probabilities... must be sufficient to compensate for the risk of disappointment.’ But this is true, he adds, only ‘if it can be so calculated, which is doubtful’ (GT, 169).

¹³ Though the line that Keynes draws between ‘money’ and ‘securities’ in this model is highly flexible (Culham, 2020, 498), in effect designating greater and lesser liquidity, the choice remains a binary and so susceptible to Hicks’s ‘portfolio’ critique.

First, he draws a direct analogy between futures trading and long and short-term borrowing, pitting hedgers ('primary' lenders and borrowers) against speculators (major financial intermediaries who borrow short-term and lend long-term). But he also speaks of a society-wide opposition between price-setting, 'sensitive' speculators and the price-taking, 'insensitive' public. In this way, large investors' economies of scale not only determine the value of money but of risk—an autonomous price over and above liquidity.

As readers have noted, Hicks's theory of the term structure of interest rates uses Keynes's forward market to show how credit markets, too, are dominated by an asymmetry of needs and risks; a permanent gap between lenders, who prefer lending short-term, and borrowers, who prefer to borrow long (Hamouda, 1985; Brillant, 2014; Fantacci et al., 2014). Just like forward contracting, a 'risk premium' emerges—separate from any counterparty-risk premium. It rises from the relationship between natural hedgers—common lenders and borrowers—and banks and other intermediaries, who act as 'speculators' in credit, lending long and borrowing short (Brillant, 2014, 1097):

the forward rate of interest... is thus determined, like the futures price of a commodity, at that level which just tempts a sufficient number of 'speculators' to undertake the forward contract. It will have to be higher than the short rate expected by these speculators to rule in that week, since otherwise they would get no compensation for the risk they are incurring. The forward short rate will thus exceed the expected short rate by a risk-premium... (Hicks, 1939, 142–3)

These aggregate forward rates, along with their risk premiums, give us the long-term interest rate. As Hicks himself concedes, 'it is not usual to think of the market for long-term loans in terms of hedgers and speculators; but that distinction does in fact continue to be relevant here' (Hicks, 1939, 146).

A second, less explicit, but arguably even more significant encounter of hedgers and speculators brings together Hicks's dual critique of Keynes's liquidity preference, regarding transaction costs and the binary choice between assets. Hicks speaks of 'our representative individual distributing his assets among relatively safe and relatively risky investments' (Hicks, 1935, 10). But he also shows how portfolio optimisation, and therefore the price of money and of risk, is bound with the kind of liquidity only financial institutions can really command:

banks themselves, financial houses, public institutions, large industrial and commercial firms, all of these have at their disposal a whole gamut of securities of different maturity... if the long rate is too low to compensate for the risk of capital loss, they begin to go into shorts; if the short rate is too low to compensate for the risks involved even there, they hold cash; it does not take much to induce them to make these changes. It is these professional investors, operating upon the whole gamut, and paying close attention to small differences in rates, who provide most of the logic of the interest system. (Hicks, 1939, 169)

What then of the general public? The public, for Hicks, remains 'insensitive' to the price signals that get professional speculators going and rarely enters this high-stakes game. This point is crucial. Although institutional investors each enjoy lower risks and transaction costs due to their volume of trading, speculators in the aggregate have a destabilising effect, much along the lines described by Keynes. They are erratic and tend to mimic each other, inflating speculative bubbles. It is, therefore, the role of the public, Hicks argued, to provide a counterbalance. The insensitive, he writes, are

‘always there to act as a flywheel, defeating by their insensitivity both the exaggerated optimism and the exaggerated pessimism of the sensitive class’ (Hicks, 1935, 18).¹⁴

One may suggest, therefore, that the opposition of the ‘sensitive’ and the ‘insensitive’ is an aggregate version of the risk-premium: to increase stability in society the many must sacrifice an optimal balance of risk and reward, holding mainly money as an imprecise reserve fund, so that the few can be lured into the high-risk-high-reward game of investment. Indeed, Keynes’s ‘precautionary’ motive, which Hicks mostly dismissed, comes to define the greater part of the population, which is effectively barred from accessing liquid securities markets and opportunities for speculation or even hedging.

‘There is no reason’, Hicks concluded, ‘why policies which tend to economic welfare, statically considered, should also tend to monetary stability. Indeed, the presumption is rather the other way round’. Neoclassical utilitarianism, as the art of human welfare grounded in equal access and agency, doesn’t really work when we take into account the effects of risk and uncertainty. Economies of scale, according to Hicks, dictate financial-market concentration and impose practical limits on maintaining free and open competition in capital assets and securities.

The stability of the market, in this somewhat grim view, requires that two classes, or types of actors, be maintained, even at the cost of ‘harming a great many people a little for the conspicuous benefit of a few’ (Hicks, 1935, 19). It is the same gambling spirit and profit-mindedness of investors that Keynes identified as the driving force of private investment (GT 150, 161). In Hicks’ vision, the only way to contain uncertainty is to allow and encourage some to reap its biggest rewards by taking on the greater share of its potential losses.

Hicks’s conclusion, therefore, is strikingly similar to the one reached by Frank Knight in his definition of the enterprise system as ‘the system under which the confident and venturesome “assume the risk” or “insure” the doubtful and timid’ (Knight, 1921, 269–70). ‘Under the enterprise system’, Knight added

a special social class, the businessmen, direct economic activity; they are in the strict sense the producers, while the great mass of the population merely furnishes them with productive services, placing their persons and their property at the disposal of this class; the entrepreneurs also guarantee to those who furnish productive services a fixed remuneration. (ibid. 271)

By analogy, the speculators and institutional investors direct monetary activity and are, in the strict sense, the price setters of risk, while the great mass of the population furnishes them with stability and speculative opportunity, in return for greater individual security, or at least liquidity.

7. Conclusion

Despite significant overlap and mutual influence, Hicks and Keynes’s models offer distinct pathways for dealing with uncertainty. These differences, I argue, are rooted in their epistemological disagreements and their respective preferences for private or public remedies. In Keynes’s model, ordinary people—households and businesses—act as the ultimate price setters of money in a system where money is a crucial safeguard

¹⁴ In the same way, non-investors temper asset-price bubbles through their ‘wealth management,’ increasing their demand for money as their wealth grows, whereas institutional investors tend to increase investment at the expense of cash holdings when they encounter positive market signals (Hicks, 1935, 18).

against the unexpected and, in part because of that, plays a decisive role in determining all other prices. For this reason, his account is premised on a strong public actor that can signal monetary stability and a willingness to step in to correct the market, taming public fears and guiding investors' convention-led expectations. Given the political will, the monetary authority could also guarantee greater public access to money—a tradable 'asset', really a tradable hedge, which all are bound to use.

In Hicks's account, on the other hand, the public doesn't set the price of money and speculation is almost exclusively the business of large institutional investors. Speculators work with precise notions of the future, move their wealth around accordingly, and help lower the costs of uncertainty. Meanwhile, the public, in its capacity as price taker, must adjust its consumption according to changes in the interest rate and, in its 'insensitivity' to small price changes, balance out the volatile movements of investors. Where Keynes saw government as the main stabilising agent, therefore, for Hicks this role was reserved for the public itself.

Hicks's new vision of financial markets as mechanisms for the efficient allocation and pricing of risk provided a model for the postwar formalisation of risk—and a risk-centred financial logic—in equilibrium. 'We will take it as axiomatic', wrote Kenneth Arrow,

that individuals are risk-averse so that the bearing of risks is a cost and the shifting of risks to others a good... As part, then, of the general use of market [sic] for exchanging goods, we expect to find markets in which risks are traded. The risks are shifted to those more able to bear them until at the margin the cost to the risk-bearer is equal to the benefit to the risk-shifter... In fact, if markets are created for every commodity *for every contingency*, then the general competitive equilibrium leads to an efficient allocation of risk-bearing. (Arrow, 1978, 5, emphasis added)

The logic of the market for risk, as this passage makes clear, necessitates its expansion to the point at which we have markets 'for every contingency'. The model, therefore, presupposes a practical impossibility: the full elimination of uncertainty, without which the price of risk can never be fully accurate, fair, or stable.

Arrow's work extended to its logical extreme the original Knightian project of applying the 'insurance principle' to equilibrium analysis. In contrast, Hicks's system heeds both Knightian and Keynesian notions of uncertainty, adopting the former's idea of profit-earning uncertainty bearers, reimagined as speculators, and the latter's emphasis on the public demand for money as a precautionary measure. Setting up the fundamental opposition of risk-takers and the risk-averse, Hicks also captured Knight's and Keynes's emphasis on temperament and psychology in determining these social roles: the Knightian entrepreneur's 'desire to excel, to win at a game' (Knight, 1921, 360) and Keynes's idea of 'animal spirits' and the 'spontaneous urge to action' (GT, 161). By accepting the 'risk premium' as a key component of the price of financial assets, the idea of a market for risk founded on this formative social divide lives on in contemporary institutions.

Hicks's conclusions, reverberating in the works of Arrow, Jacob Marschak, and Paul Samuelson (Mehrling, 2010, 208) and increasingly in financial-market regulation and monetary policy as well, raise some important political questions, a century after Knight first laid out his theory of profit. In 2016, the top 1 per cent of the US population owned 55.6 per cent of all financial investments while the bottom 90 per cent owned 9.2 per cent (Wolff, 2017, 53). While responses to the financial crisis have focused on government bailouts and 'quantitative easing', far less has been said of the

prospect that the widely unequal distribution of financial assets was itself a form of ‘risk-management’, necessitated by the internal logic of the financial system.

We must now ask whether these inequalities have produced the level of affordable safety they are purported to provide, and, more importantly, whether this a socially and politically acceptable price to pay for safety at all. If one follows Hicks’s Knightian story, with a Keynesian twist, speculation necessarily leads to severe market concentration, while relying on the general public to provide stability by virtue of its exclusion. Financial markets so conceived are not the site where all utility-maximising individuals are treated equally. Rather, they are structured as an encounter of opposites—the timid and the daring—in a modern-day Machiavellian opposition of class appetites. Before holding financial markets to their lofty promises, therefore, of providing security, it is imperative to ask whether this is the social reality our economic institutions should be geared to uphold.

Bibliography

- Arrow, K. J. 1964. The role of securities in the optimal allocation of risk-bearing, *The Review of Economic Studies*, vol. 31, no. 2, 91–6.
- Arrow, K. J. 1978. Risk allocation and information: some recent theoretical developments, *The Geneva Papers on Risk and Insurance - Issues and Practice*, vol. 3, no. 2, 5–19.
- Ascher, I. 2016. *Portfolio Society: On the Capitalist Mode of Prediction.*, New York, Zone Books
- Bateman, B. W. 1996. *Keynes’s Uncertain Revolution*, Ann Arbor, University of Michigan Press
- Beggs, M. 2015. Liquidity’s other career, paper presented at the History of Economics Society Annual Conference, Lansing, MI.
- Berle, A. A. and Means, G. C. 1933. *The Modern Corporation and Private Property*, New York, Macmillan Co
- Bibow, J. 1998. On Keynesian theories of liquidity preference, *The Manchester School*, vol. 66, no. 2, 238–73.
- Blaug, M. 1985. *Economic Theory in Retrospect*, Cambridge, Cambridge University Press
- Brillant, L. 2014. A reconsideration of the role of forward-market arbitrage in Keynes’ and Hicks’ theories of the term structure of interest rates, *European Journal of the History of Economic Thought*, vol. 21, no. 6, 1085–101.
- Clark, J. B. 1902. *The Distribution of Wealth: A Theory of Wages, Interest and Profit*, London, The Macmillan Company
- Cowles, A. 1933. Can stock market forecasters forecast?, *Econometrica*, vol. 1, no. 3, 309–24.
- Culham, J. 2020. Revisiting the concept of liquidity in liquidity preference, *Cambridge Journal of Economics*, vol. 44, no. 3, 491–505.
- Dow, J. C. R. 1940. A theoretical account of futures markets, *The Review of Economic Studies*, vol. 7, no. 3, 185–95.
- Fantacci, L., Marcuzzo, M. C. and Sanfilippo, E. 2014. A note on the notions of risk-premium and liquidity-premium in Hicks’s and Keynes’s analyses of the term structure of interest rates, *The European Journal of the History of Economic Thought*, vol. 21, no. 6, 1102–8.
- Fiorito, L.. 2013. When economics faces the economy: John Bates Clark and the 1914 antitrust legislation, *Review of Political Economy*, vol. 25, no. 1, 139–63.
- FTC. 1920. *Report of the Federal Trade Commission on the Grain Trade, Vol. II 192026*. Washington, DC: Federal Trade Commission. [http://hdl.handle.net/2027/uc1.\\$b671200](http://hdl.handle.net/2027/uc1.$b671200). Accessed 11 August 2017.
- Gillis, D. 2006. Keynes and probability, pp. 199–216 In: Bateman, B. W. and Backhouse, R. E. (eds), *The Cambridge Companion to Keynes*, Cambridge, Cambridge University Press
- Hamouda, O. F. 1985. The evolution of Hicks’ theory of money, *Bulletin of Economic Research*, vol. 37, no. 2, 131.
- Hayes, M. G. 2018. The liquidity of money, *Cambridge Journal of Economics*, vol. 42, no. 5, 1205–18.
- Hicks, J. 1931. The theory of uncertainty and profit, *Economica*, no. 32, 170–89.

- Hicks, J. 1935. A suggestion for simplifying the theory of money, *Economica*, vol. 2, no. 5, 1–19.
- Hicks, J. 1936. Keynes' theory of employment, *The Economic Journal*, vol. 46, no. 182, 238–53.
- Hicks, J. 1939. *Value and Capital: An Inquiry into Some Fundamental Principles of Economic Theory*, Oxford, Clarendon Press.
- Hicks, J. 1962. Liquidity, *The Economic Journal*, vol. 72, no. 288, 787–802.
- Hicks, J. 1973. Recollections and documents, *Economica*, vol. 40, no. 157, 2–11.
- Hirsch, R. forthcoming. Uncertainty, profit and the limits of markets, *Political Research Quarterly*.
- Kaldor, N. 1939. Speculation and economic stability, *The Review of Economic Studies*, vol. 7, no. 1, 1–27.
- Keynes, J. M. 1937a. The 'Ex-Ante' theory of the rate of interest, *Economic Journal*, vol. 47, 663–69.
- Keynes, J. M. 1937b. The general theory of employment, *The Quarterly Journal of Economics*, vol. 51, no. 2, 209–23.
- Keynes, J. M. 2013a. *The Collected Writings of John Maynard Keynes Vol. VI: A Treatise on Money in Two Volumes; 2) The Applied Theory of Money*, Cambridge, Cambridge University Press for the Royal Economic Society. [ToM].
- Keynes, J. M. 2013b. *The Collected Writings of John Maynard Keynes Vol. VII: The General Theory of Employment, Interest, and Money*, Cambridge, Cambridge University Press for the Royal Economic Society. [GT]
- Keynes, J. M. 2013c. *The Collected Writings of John Maynard Keynes Vol. VIII: A Treatise on Probability*, Cambridge, Cambridge University Press for the Royal Economic Society. [TP]
- Knight, F. H. 1937. Unemployment: and Mr. Keynes's revolution in economic theory, *The Canadian Journal of Economics and Political Science*, vol. 3, no. 1, 100–23.
- Knight, F. H. 1921. *Risk, Uncertainty and Profit*. Boston; New York: Houghton Mifflin Company.
- Laidler, D. E. W. 1999. *Fabricating the Keynesian Revolution: Studies of the Inter-War Literature on Money, the Cycle, and Unemployment*, Cambridge; New York, Cambridge University Press.
- Langlois, R. N. and Cosgel, M. M. 1993. Frank knight on risk, uncertainty, and the firm: a new interpretation, *Economic Inquiry*, vol. 31, no. 3, 456–65.
- Lawson, T. 1985. Uncertainty and economic analysis, *The Economic Journal*, vol. 95, no. 380, 909–27.
- Lawson, T. 1988. Probability and uncertainty in economic analysis, *Journal of Post Keynesian Economics*, vol. 11, no. 1, 38–65.
- LeRoy, S. F. and Singell, L. D. 1987. Knight on risk and uncertainty, *Journal of Political Economy*, vol. 95, no. 2, 394–406.
- Levy, J. 2012. *Freaks of Fortune: The Emerging World of Capitalism and Risk in America*, Cambridge, Mass, Harvard University Press
- MacKenzie, D. A. 2006. *An Engine, Not a Camera: How Financial Models Shape Markets. Inside Technology*, Cambridge, Mass, MIT Press
- Marcuzzo, M. C., ed. 2012. *Speculation and Regulation in Commodity Markets: The Keynesian Approach in Theory and Practice. MPRA Paper*. Germany, University Library of Munich
- Mehrling, P. 2010. A tale of two cities, *History of Political Economy*, vol. 42, no. 2, 201–19.
- Mehrling, P. 2011. *The New Lombard Street: How the Fed Became the Dealer of Last Resort*, Princeton, N.J, Princeton University Press
- Minsky, H. P. 2008. *John Maynard Keynes*, New York, McGraw-Hill
- Morgan, M. S. 1992. *The History of Econometric Ideas*, Cambridge, Cambridge University Press
- Patinkin, D. 1990. On different interpretations of the general theory, *Journal of Monetary Economics*, vol. 26, no. 2, 205–43.
- Runde, J. 1994. Keynesian uncertainty and liquidity preference, *Cambridge Journal of Economics*, vol. 18, no. 2, 129–44.
- Runde, J. 1998. Clarifying Frank Knight's discussion of the meaning of risk and uncertainty, *Cambridge Journal of Economics*, vol. 22, no. 5, 539–46.
- Sawyer, L. P. 2018. *American Fair Trade: Proprietary Capitalism, Corporatism, and the "New Competition," 1890–1940*, New York, Cambridge University Press
- Shackle, G. L. 1961. Recent theories concerning the nature and role of interest, *The Economic Journal*, vol. 71, no. 282, 209–54.
- The Economist, 37. 1867. *Why the Number of Good Investments Is So Small*. <https://books.google.com/books?id=nEtUAAAACAAJ>. Accessed 20 July 2021.

- Weintraub, E. R. 2002. *How Economics Became a Mathematical Science*, Durham; London, Duke University Press
- Wolff, E. 2017. Household wealth trends in the United States, 1962 to 2016: has middle class wealth recovered?, *NBER Working Paper Series*, 24085.