

How to Read the Future: The Yield Curve, Affect, and Financial Prediction

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We are merely reminding ourselves that human decisions affecting the future, whether personal or political or economic, cannot depend on strict mathematical expectation, since the basis for making such calculations does not exist; and that it is our innate urge to activity which makes the wheels go round, our rational selves choosing between the alternatives as best we are able, calculating where we can, but often falling back for our motive on whim or sentiment or chance.

—John Maynard Keynes, *The General Theory of Employment, Interest, and Money*

The future is unknowable. Yet in global financial markets, profits and protection of wealth depend on actions taken under this necessarily uncertain condition. Several decades ago John Maynard Keynes pointed to the modern desire for clear knowledge in economic activity. Statistical data promise certainty. Affect arises when knowledge has no solid ground. The future, for him,

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defined the limits of reason most powerfully. “Whim,” “sentiment,” and “chance” enter at the edges of calculation. The twin poles of reason and affect define certainty and uncertainty, two key sets of modern divisions, as unattainable as they are powerful. However, Keynes recapitulates the chimera of these categories even as he notes the impossibility of strictly mathematical approaches to financial problems. Judgments regarding the future, even those based on statistical assessment, easily entwine with sentiments. In trading and investing practices today, Keynes’s famous assessment is as salient as when he published his *General Theory*. Yet his clear distinction between calculation and feeling tenders a modern fantasy (see Keynes 2008). The affects that Keynes assigns to the limits of reason accrue even as calculation proceeds.

I argue here that contemporary financial knowledge is organized around the interplay of reason and affect. The composition and use of common financial tools provide a window onto this process. The devices that should create grounds for calculating future profits and opportunities also open avenues for affective discomfort. How does the organization of contemporary economic knowledge elicit the perturbation or excitement of financial experts? Predictive instruments flag economic risks by consolidating the individual assessments of market participants regarding the future. At the same time, their signals feed back into professionals’ affects and decisions in striking ways.

The reflexive character of financial devices provides fertile ground for emotions. In this, these tools share characteristics with the shaky knowledge that undergirds “reflexive modernity” as Anthony Giddens (1990) describes it. Giddens assigns a pervasive feeling of disorientation to modernity, linking discomfort to the inability to ever fully understand or complete the technoscientific systems that define the contemporary world.¹ As practitioners of reflexive modernity, financial professionals design and act within the expert systems that create and monitor risk in contemporary markets. Yet even such direct technical understanding and experience do not provide the certainty that modern knowledge promises. Financial actors share the puzzlement to which Giddens points. Experts, too, are caught up in the play of reason and affect around the systems of their own creation. But why? How might the particulars of financial prediction help to characterize reflexive, modern knowledge systems?

1. Giddens (1990: 2) argues that “the disorientation which expresses itself in the feeling that systematic knowledge about social organization cannot be obtained . . . results primarily from the sense many of us have of being caught up in a universe of events we do not fully understand, and which seems in large part outside of our control!”

The yield curve of the U.S. Treasury, a widely used indicator of economic strength, offers a compelling example.² The curve is a graphic representation of U.S. bonds' future value. A powerful model of the future, it points to the health of America's economy and therefore reflects global economic stability. Financial participants are knitted in a loosely entangled economic public through recursive loops of feeling, reading, interpreting, and acting around this tool. The yield curve unifies a field of market action, reflection, and emotion, bringing together the dispersed and disparate actors who make up the credit market. Financial experts—professional traders, hedge fund managers, economic planners, and others—become impassioned about the future as the curve bends and twists. For these actors, both internationally and in the United States, the curve's shape crystallizes particular uncertainties about the future under the specific conditions of the present.³ However, the fundamental indeterminacy of the future does not fully explain the power of the affects that the curve's movements elicit.

The design of the yield curve, like many predictive tools, embodies contradictions that disturb even as they offer knowledge. The curve was constructed as a device for understanding risk and time in the U.S. Treasury market. An image of the relationship between bond yields of varied durations, the curve offers a way to understand the market's collective assessment of the future (i.e., whether the economy is weak or strong). At the same time, it shows savvy investors where profit potential lies if they can outsmart the dealers whose trades make up the curve. It is a terrain of future knowledge and intervention. It is also an affective lightning rod.⁴ As an indicator, the yield curve points to the particular uncertainties of the economy to come. But the curve does not merely indicate; like all indicators, it also produces its own uncertainties.

As a predictive tool, the yield curve's effectiveness is bound to its particular social content. If the participants are rational, then the yield curve's signals about the future should be valid. Bank traders and hedge fund managers assume their counterparts act as they do: working to gather information about the forces that

2. The yield curve takes part in a broader contemporary field of "narratives, models, and scenarios [that] capture in useful ways the uncertainties, contingencies, and calculations of risk that complex technologies and interactions inherently generate" (Fischer 2003: 2).

3. It is one of the many ways that "the future manifest[s] itself in the present," to follow Niklas Luhmann (1998: 63).

4. Predictive models constitute fields by organizing feeling as well as thought and action. Andrew Lakoff (2008: 401) makes a similar point, arguing that scenario-based exercises around biological threats "generate an affect of urgency *in the absence of the event itself*" (my italics). As with a feared, but unrealized, outbreak of bird flu, so with an inverted yield curve. Affect accrues to the model (either live-action or graphic) as it crystallizes the possibility of an event.

will shape the course of the economy and then buying or selling accordingly. These individual rational decisions should draw an aggregate picture of economic prospects. However, the market may include traders whose intentions or “irrational” judgments distort the picture. The bond market cannot be assumed to be composed of only judicious experts. Yet participants can never know who exactly does what in the market.

Rational prediction can proceed only on the faith in the rationality of the market players whose opinions create the predictive device. The techniques and technologies of reflexive finance are shot through with such fissures. These clefts deny financial professionals the ability to form the smooth affect of trust that might accompany more predictable systems. Rather, questions about the basic rationality of their market competitors undermine confidence in the tools of their analysis. Inevitably, anxiety, fear, and suspicion creep into the most calculating financial minds. A lack of faith in the rational actions of others renders the yield curve a useful but not fully reliable tool. Speculative questions arise: Can the yield curve and its predictions be trusted? Who, exactly, is making it move? What does its image really reveal about the future?

In the following pages I develop a picture of the yield curve as a simultaneously epistemic and affective object that financial professionals place at the heart of their planning and trading practices.⁵ By examining the specific history of the yield curve, its public life, and the affective responses to its twists and turns, I illustrate how predictive tools shape visions of the future in the practice of financial capitalism and, in the process, form their own locus of doubt and disturbance.⁶

I begin with a brief history of the curve itself, which provides a window onto the collective constitution of global financial markets, their participants and spectators, and the devices that allow investors, traders, and interested civilians to monitor them. I then examine how economic professionals react to the yield curve today in the financial public sphere, including news media, newsletters, and specialist blogs. Online discussions of the yield curve are especially compelling. Blogs in particular offer a set of commentaries that track the constant movement

5. The social studies of finance has begun to place such tools under scrutiny, examining how technologies like the ticker (Preda 2006), trading screens (Knorr Cetina and Breugger 2002), open outcry trading pits (Zaloom 2006), and formulas like the Black-Scholes model (MacKenzie 2006) coordinate markets.

6. Recently, anthropologists have drawn attention to how models create visions of political and scientific possibility and the conditions of knowledge and political action (Fischer 2003; Rabinow and Dan-Cohen 2006; Lakoff 2008). In particular, Timothy Mitchell (1998, 2002) and Janet Roitman (2004) have argued that economic technologies like the yield curve make the economy and its future visible, intelligible, and governable.

of the yield curve and change as the curve's assessment shifts. Provisional explanations, such as those online, are key to understanding the affective life of technical instruments. Professionals' discussions often reference, and then depart from, textbook descriptions of the yield curve, offering ongoing and loose interpretations of the curve's movements. The contrast between Internet discussions and academic representations shows the interplay between the conditional analysis of day-to-day work and the formalized ideas of technical models.

What Is the Yield Curve?

The yield curve provides a picture of the emerging economy. Fund managers, traders, and bank-based economists attempt to exploit the curve's fluctuations. Academic economists consult the curve for information that they use in planning reports and public policy. The author of *The Bond Bible* claims, "A good understanding of the Treasury yield curve is the foundation for any good bond investor or trader" (Cohen 2000: 18). In December 2005 one hedge fund manager told me of its centrality in the financial universe, offering celestial reverence as he called it "the sun around which everything else revolves." Throughout the workday its image appears on Bloomberg terminals, electronic trading screens, and official government charts, with its shape shifting at a dizzying pace. Longer-term twists in the curve are also meaningful. An "inverted" curve has preceded each recession since the mid-1960s (with one exception), a record that some use to orient their strategies, while others question its salience. Traders and investors read, reflect, and nervously anticipate movements in the curve, a robust yet controversial predictor of economic health or weakness. Their future profits could depend on it.

The yield curve is also widely used for understanding investors' collective sentiments about the future conditions in the U.S. economy and for orienting financial planning and policy. Interest rates are the major monetary tools of the U.S. government, a power directly reflected in the yield curve's graphic image. The curve graphically depicts today's Treasury "yields," or the relationship between the interest rate and the time to maturity of a bond.⁷ The interest rate is particularly important because it defines the premium the market is demanding for the use of its money over time, a price based on the risk of changing economic

7. Yield curves are also commonly drawn for other fixed-income securities such as corporate bonds. I focus here on the U.S. Treasury yield curve because it is widely consulted and also because the curve has global resonance. This is particularly true since U.S. Treasuries are considered a gold standard of global investment and are widely held by foreign governments and investors as well as by U.S. individuals, financial firms, and corporations.

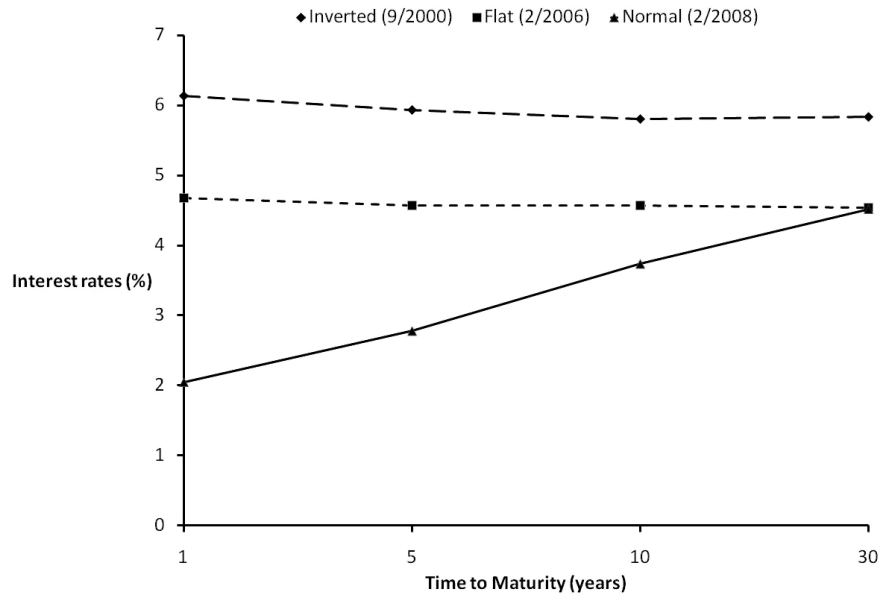


Figure 1 Normal, flat, and inverted yield curves

conditions and the length of the loan. U.S. instruments of debt—bills, notes, and bonds—come in different “maturities” or durations, from a few days to thirty years. The yield curve visually describes the relationship between the yields of these different bonds. Figure 1 illustrates normal, flat, and inverted yield curves. As the latter two curves show, the relationships between points are flexible, leading sometimes to distortions from the normal. Movement in the slope of the curve is affected mainly by two actions: the monetary policy of the Federal Reserve as it raises or lowers short-term interest rates, and the buying and selling of U.S. Treasury bonds.⁸ Financial professionals read these fluctuations carefully and dissect them with focused consideration.

But not all shapes of the yield curve require similar intensities of attention. At

8. Translating academic research on the yield curve for its subscribers, the Federal Reserve Board of San Francisco summarizes three types of yield curve movement: level, slope, and curvature. Level moves all yields up or down. Slope moves short-term yields more than long-term yields or vice versa. Curvature affects medium-term yields and causes the curve to be humped. The Federal Reserve’s interest rate decisions directly affect the short end of the curve. However, it is the expectations of financial professionals derived, in part, from the Federal Reserve’s actions that affect the long end (Wu 2003).

certain moments the yield curve becomes troubling and therefore begs for explanation. This is particularly true when the yield curve flattens or inverts. Under ordinary conditions risk increases with time and so does the premium for borrowing money; after all it is harder to assess economic conditions twenty years in the future than it is two years out. These conditions produce a normal yield curve. The flattened yield curve is a disquieting object for economic actors because it indicates a bending of the relationship between risk and time, a kink that requires explanation and the creation of new profit and policy strategies. A flattened curve provokes anxieties, raising questions: Why does it look this way? What does that mean for the future?

A New Epistemic Terrain

For its readers today, the yield curve provides clues to an uncertain future, but the curve itself arises from a specific past. The yield curve's significance emerged in the 1970s and 1980s, times of transformation in global finance. As U.S. economic hegemony unraveled, the American government and international bankers developed markets around the newly ambiguous terrain of economy and politics. The yield curve represents these powerful uncertainties in statistical form. The model's history explains how the yield curve came to command traders' attention.

In the 1970s the U.S. government introduced a new relationship between time and money. For more than two decades the Bretton Woods system had tied the world's currencies to the American dollar, deriving value from the economic prowess of the global superpower. The economic strength of the United States was also marked in its debt control. The government set the interest rates for bonds, instructing investors how much they would pay to lend money to America. However, as petrodollars amassed in the Middle East and the Vietnam War wore on, the rise of rival economic powers to U.S. hegemony brought the Bretton Woods agreement to an end. American currencies and interest rates would "float" on the open market.

The uncertainty of future economic events replaced the faith in American economic hegemony. Investors, not the U.S. government, began to set the prices of dollars and America's debt. Bank traders now bought and sold on the shifting and unsteady prospects of the American economy going forward. Investors in currencies and Treasuries would assess the prospects of America's future economy, marking their judgments with purchases and sales of American debt, their votes on the health and strength of the national economy. What are the American econ-

omy's potentials and perils? How well is it being governed? Ultimately, investors could now assess how much the United States would have to pay them to borrow money. The credit market would judge the present and future health of the American economy, as traders acted on both their reasoned judgments of statistical indicators and their hopes and fears for the economic future.

As the U.S. government allowed the market to set values for American bonds, key players in the bond markets and in bond theory built the significance of the yield curve with their novel trading strategies and writings. Before this shift, bonds had been dealt as distinct packages of time; traders were assigned to separate markets in two-, five-, and ten-year bonds. During the 1970s traders conceived of these bonds instead as a continuum of moments. Traders' deals embodied their assessments of risk along the curve, connecting the formerly independent packages of time and money. These trades enlivened an image of an unbroken and uncertain future, an image that offered both profit potential and prognostication. In the process, the yield curve became an important topic of debate both among financial professionals and in the popular press. The following section traces how the yield curve became both a tool for making money and a collective device for representing uncertainties related to time.

Yield curve analysis began to accelerate in the mid-1960s. In a 1965 paper published by the National Bureau of Economic Research (NBER), Ruben Kessel noted that the "spread" (or difference) between long- and short-term yields tended to be slim at the start of a recession (quoted in Estrella 2005b). At the same time that the NBER was citing the policy-level implications of the yield curve, the powerful New York bond house Salomon Brothers began to pay attention to it for profit. Salomon Brothers' fixed-income analyst Sidney Homer shook up the bond world by promoting active management of these formerly staid investments. Homer laid the foundation for the rise of quantitative analysis in bond trading. He also published influential books of interest rate analysis. His 1963 book *A History of Interest Rates*, written with Richard Sylla, gave force to the view that "the free market long-term rates of interest for any industrial nation, properly charted, provide a sort of fever chart of the economic and political health of that nation" (Homer and Sylla 2005: 3). From ancient Sumer to the industrial revolution in England to the contemporary United States, Homer and Sylla (2005: 3) argued, "wars and political and economic calamities are recognizable at sight on the charts." Connecting the yield curve to history's economic events and social sea changes that remained unrecognizable in their unfolding, Homer and Sylla presaged a new predictive potential for interest rates.

Reviewing the third edition of *A History of Interest Rates*, Larry Neal (1992: 753) distilled the book's argument about the interest rate in a different way: "This pure number had always had the same significance wherever and whenever it was produced, so that comparisons could usefully be made between observations drawn from different places and times." Homer and Sylla's focus on the interest rate as a number disconnected from a specific time and place provided a powerful argument for analysts to look first to the interest rate itself as a clue to underlying conditions. The number could be interpreted without initial reference to the specifics of time and place, allowing the interest rate to speak not only about the contemporary financial order but also about the impact that current events may have on future economic conditions. The yield curve's wider salience continued to grow in the 1970s under Homer's chosen successor at Salomon Brothers, Martin L. Leibowitz. Their coauthored *Inside the Yield Book* (now subtitled *The Classic That Created the Science of Bond Analysis*) offered detailed bond trading techniques, such as swaps, and new ways of understanding the relationships between and among bond maturities (Homer and Liebowitz 2004).

Leibowitz's time as head of bond research coincided with a moment of great consequence for the bond market and for the world economy. During Homer's tenure, the values of currencies, interest rates, and gold were fixed. But as Leibowitz took his seat at Salomon Brothers, these financial objects began to float. This meant that as governments removed restrictions on their currencies and debt, the market began to set prices for dollars, bonds, and interest rates. Leibowitz, a PhD mathematician, received Salomon Brothers' first computer and used it to calculate the prices for bonds, and even fractions of bonds, that led him and his team to begin trading fixed-income securities in ways the conservative debt market had never before seen (Lowenstein 2001: 8).

The Salomon Brothers dealers connected the sweep of a graph line with techniques to exploit the relationships between future points in time. Before Leibowitz trained his team in this new economic vision, separate cadres of traders had dealt in each of the maturities of U.S. bonds. The two-year note stood alone, and traders bought and sold the security looking at the risks that lay in the economy to the point of the bond's expiration (Dunbar 2001). Leibowitz spied an opportunity in floating interest rates, when the market, rather than the government, set rates through buying and selling of bonds. Leibowitz's team began to trade along the curve. With the insight of a connected future, his dealers could trade pieces of bonds that represented moments along the curve, generating profit-making opportunities from these temporal relationships. Their practice connected what had been previously considered separate packages of time and traded as separate

markets. These practices brought life to a new market vision that animated the curve with the health or weakness of the economy to come.

Salomon Brothers was not the only financial powerhouse to take advantage of the new life of bonds. As money in time became a commodity, futures exchanges began to shift from their old-fashioned trade in grains and meats to the new markets in currencies and interest rates. The Chicago Board of Trade opened its U.S. Treasury Bond futures pits in 1977. As what was known as the “Treasury complex” grew, the yield curve emerged as a source of profit when deviations from its normal shape provided trading opportunities. “Spreaders,” accustomed to trading the price of December wheat against that for July, could now trade on the fluctuating relationship between, for instance, ten- and thirty-year bonds. Both the expansion of futures markets into interest-rate-related areas and the explosion of economists’ commentaries on the yield curve, assessing both its predictive power and its meaning, attest to the yield curve’s growing significance (Estrella 2005b).

The 1970s introduced an interconnection among global currencies, government bonds, and the technological systems that would link traders in real time across vast distances. As yield curve analysis and bond trading rose and the academic economic discourse caught up, the curve became a key object for representing the dispersed and technologically connected character of the contemporary economy. Markets had always operated through distant connections, but the yield curve added something crucial: an object with which market players could both participate in and reflect on the economy.⁹

As price setting moved from government to market, the yield curve took on new significance. When the U.S. Treasury set rates, interest prices registered government requirements and control. Once bond yields recorded primarily collective buying and selling, the curve could be read as an aggregate opinion to which individual players added their voice. The curve could stand in for the feelings of the market about the future of the U.S. economy, about current federal policy in shaping it, and about the potential of economic and political events to alter financial plans. The market’s vision of the future, and the risks that lay in the economy’s moving toward the punctuating points where debt obligations came due, could be viewed as a temporal continuum written with the expectations of financial professionals. The market-directed relative rise and fall of rates raised the possibility that perspicacious readers of the yield curve would perceive important events in their midst.

9. The yield curve is, then, a model through which economic “practices and simultaneously a nature capable of being theorized are stabilized” (Lenoir 1998: 6). The “nature” here is the market, which the yield curve makes visible and interpretable.

It took a few years for traders' vision of the yield curve to filter into more general use. The *Economist* (1976) provided its readers with a tutorial on the economic elements that shape the yield curve. The *New York Times* first mentioned the yield curve in 1978, noting that President Jimmy Carter's new Federal Reserve chairman was responding to the credit market's "gloomy" demeanor with an intention to reshape the yield curve (Allan 1978). The New York paper followed up in April 1979 with a tutorial on the curve for its investor-class readers that began, "If the yield curve is telling the truth, lower interest rates lie ahead. To understand what that means an investor must know what a yield curve is, how it is plotted, and what its uses are," before explaining these technical details (Allan 1979). Emphasizing the link between politics and the yield curve, the *Washington Post* first mentioned it in 1978 while evaluating the outlook for the economy (verdict: dismal) with reference to rising interest rates along the curve (Lebherz 1978). In 1979 the *Post* broadened its audience's understanding of the yield curve by explaining bond investors' strategies to its general readers. Later that year the *Post* used the curve in its analysis of politics and economy as it linked an inverted curve with the anticipated nomination of Paul Volcker as Federal Reserve chairman (Lebherz 1979).

What had begun in the 1970s continued with the expansion of fixed-income trading in the 1980s and 1990s. Traders, policy makers, and the public turned to the yield curve to reflect on the market's judgment of the economic future. The yield curve established a new relationship between money and time. Bond analysis and floating interest rates positioned the yield curve as central to financial practice as global credit markets began to price government debt and currencies. In theory and in practice, financial professionals had built the yield curve into an object for interpreting the contours of a possible future. The curve also gained power as an object with which traders and planners intervened to draw profit and to manage the economy. As new techniques for trading thrived and analytic talk flowered, the curve became a powerful connection among investors around the world. This new terrain of trading on credit risk and, at the same time, monitoring it solidified the reflexive character of the yield curve.

What was at first simply a technical object for individual traders could now also speak for the credit market as a whole. In its arcs and bows, the curve displayed its judgments on the economic future. Financial professionals turned to it for answers to their questions: What are the market's feelings about the perils and potentials of the contemporary economy? What does the market think about the future? The image of the yield curve today provides important clues as buying and selling bend its shape, registering investors' opinions in price. However, it

also opens up new questions, in particular about the ability of the yield curve to make the accurate predictions claimed by many financial professionals.

The Yield Curve Today

Today two groups of finance professionals are especially interested in the yield curve: fund managers, traders, and bank-based economists, whose profit-seeking strategies draw on the curve's fluctuations, and academic economists, who read the curve for information that they use in planning reports and public policy. The yield curve changes frequently—often minute by minute—and financial experts consult it often for explanations: What will the yield curve say next? What kind of future does its image reveal? Will its past predictive record capture today's uncertainties?

The yield curve is an uncertain model for an uncertain future. Both the strengths and the weaknesses of models like the yield curve develop from their reflexive uses: the rationality of monitoring risk clashes with the heterogeneous intentions and rationalities of the traders who make up the market. Changing participants and changing economic and political conditions mean that even sophisticated models with illustrious past records cannot easily anticipate future possibilities. Through the prism of the yield curve, the market shows two faces to those who assess its expressions: it is an emergent entity composed of the simultaneous and coordinated actions of individuals making separate decisions and an aggregation, a consolidation of their opinions (marked in buying and selling) into a single number—price. Each feature figures into its participants' conscious experience and strategies, requiring constant monitoring and revision of opinions and plans.

In particular, financial professionals develop a reflexive relationship with their devices, asking questions and constantly revising opinions. Most important is to understand who is making the judgments that shape the yield curve. The conflict between the curve as a monitoring system and its constantly changing makeup creates hot debate, rendering the yield curve a lightning rod. Assessments of collective market feelings lead, then, to a cascade of affects and arguments related to the composition of the market itself.

Market Sentiments

Finance professionals examine the yield curve to understand how the market feels—optimistic or gloomy, sanguine or shaky—about the prospects of the American economy, an understanding that generates their professional sentiments

and with which they adjust their financial strategies. The market's emergent nature is responsible for this dual life: it is made up of individuals but apprehended in aggregate. Collectively, the shifts in price and therefore in mood can seem like the vagaries of a sentient being. Traders describe interactions with the market as interpersonal engagements. For instance, futures traders speak of the market's swift and painful judgments, of its striking down those who exhibit hubris or rewarding humility in their deals (Zaloom 2006). Currency traders, Karin Knorr Cetina and Urs Breugger (2000) argue, engage the market as an "object of attachment" in the Lacanian sense.¹⁰ Attachment to the yield curve compels close readings of its moods. At the same time, this attention elicits the reader's own affective relationships to it. Anxiety, concern, or confidence about the economic future hinges on the reading of the curve and the commentary around it. Sentiments, both the market's and their own, orient financial experts and policy makers in their plans for profit and governance.

A Disturbing Shape

In the fall of 2005 that judgment seemed grave. The financial world began to buzz about an impending and portentous event. The yield curve had taken on an odd shape. Its normal winglike sweep had flattened. The curve's "short end," the yield of the three-month U.S. Treasury note, had begun to approach the "long end," or the yield on the ten-year Treasury bond, indicating a pessimistic outlook for the U.S. economy. The price for selling U.S. government debt rose as the market registered increasing risks in the near future. For consumers, rising interest rates portend a sharp increase in their mortgage rates and a tightening of credit. For corporations, higher debt costs gnaw away at profits, slowing hiring and investment in new infrastructure. Though few people outside the financial professions might link a twist of their economic fate to the arc of the yield curve, the two are intricately entwined.

Later that year, in the normally sleepy period after Christmas when traders depart for vacations, the slope slumped again. The curve wilted to a positively pessimistic half frown. Fund managers, bond traders, economists, and market

10. Knorr Cetina and Breugger (2000: 144) provide a psychoanalytic framework for understanding "objects of attachment." Their ultimate goal is to expand the notion of postsocial relations in which objects are not only tools subject to the agency of humans but are also "experiencing, feeling, reflexive, and remembering beings . . . bearers of the sort of experiences we tend to reserve for the sphere of intersubjective relationships." The affective statements circling the yield curve point to its power to "speak" to its analysts in such an intersubjective capacity.

analysts chattered about what that inverted yield curve might herald. Recession was surely in the cards, many conjectured. Others argued that financial professionals should not take this seemingly gloomy sign to heart. Across the financial public—in news sites, in newsletters, and on specialist blogs—an impassioned discussion emerged about the significance of this twist.

The financial commentary on *Slate* for December 29, 2005, drolly intoned, “The dread ‘inverted yield curve’: it makes brave economists cower.” Yet author Daniel Gross (2005) assured readers that “there’s ample reason not to freak.” The yield curve, he explained, is only one among a number of indicators, some of which pointed to strength in the economy. Gross refrained from claiming that reason could fully encompass the problem that this sign of intense uncertainty produced. Instead, he stated that, even at the edge of the present, traction for understanding could still be found and that the outlook was not necessarily dire. Gross dismissed panic as the affect appropriate to the current technical condition, but he also stopped short of prescribing an affect that could orient finance professionals toward an uncertain future.

The newsletter of the Wharton School of Business proffered a similar message but on different grounds. Although the yield curve is widely read, what it says remains obscure. Wharton counseled its subscribers, “Don’t sweat the inverted yield curve: no one really knows what it means.” Some experts debated whether the curve was even truly inverted. Wharton finance professor Robert F. Stambaugh lectured that “I certainly wouldn’t describe it as a sharply inverted yield curve. It’s ‘flattish’ and downward-sloping in some segments” (Knowledge@Wharton 2006). “Flattish” or steep, the figure of the curve gathered scrutiny, and what it heralded became a constant object of debate.

Even a “normal” shape may require expert dissection. “Reading the yield curve” made headlines once again a few months later in the *Financial Times*. “What is the yield curve telling us?” the newspaper inquired. The article drew the counterintuitive conclusion that in 2007 the typical shape of the curve owed more to economic troubles than to “clear skies ahead” (*Financial Times* 2007). That summer the *Wall Street Journal* ran the headline “Yield Curve Turns Steeper as Treasuries Rise Sharply” (Blumberg and Hudson 2007). Traders and financial managers could finally take sanctuary in the shape of the curve, once again safely flexed in an upward direction. Or could they? As 2007 drew to a close and the crisis in the mortgage market spread, the yield curve continued to draw attention. Instead of just the yield curve of U.S. Treasuries, worldwide inversions became the focus. On their blog, Econbrowser, the economists James D. Hamilton and

Menzie Chinn assessed whether or not readers should be “worried” about pervasive recession. Their answer: Maybe. Stay tuned (Chinn 2007).

As an aggregate image of myriad decisions, the yield curve drives, perhaps paradoxically, constant reflection on others’ choices, thoughts, and strategies. As an image of a defined but elusive collective, the yield curve does not say who is doing and thinking what about the state of the economy. Instead, financial professionals create a virtual social world around its image. Their speculations about who is making the yield curve move provide provisional definition to an unexplainable contour. In informal settings such as blogs, speculations abound about the players and the affects that make the yield curve move. Whose actions can explain the shape of the curve—duplicious Chinese bankers, reckless hedge fund managers, or rational private equity giants? The virtual players loop around the figure of the curve and provide narrative purchase for policy makers and bond traders alike to weave their strategies and to orient their own actions. Such guesses and assertions mesh with formal explanations of the yield curve found in textbooks and in formal presentations.

Formal Theory

Economic theories codify the yield curve as the habitat of the rational investor whose actions explain the shape of the curve. These technical models provide traders and policy makers with conceptual frameworks that draw their actions in line with those that dwell in the theories. Economists have elaborated four approaches to the behavior of the yield curve. Now incorporated into the textbooks that traders and practicing economists consult, these four hypotheses summarize assumptions about investors’ behavior and in particular their preferences for investing in time, which can be detected by the shape of the yield curve.

The first, called the “market expectations hypothesis,” rests on the idea that the yield curve flexes and bends as investors’ assessments of future interest rates change. Annette Thau (2000: 68), a bond analyst and author, explains that “the interest rate expectations of market players affect the shape, or slope, of the yield curve.” Anticipating future interest rates, these financial players inscribe their expectations through buying and selling bonds, shifting the yield, and reshaping the curve. As a result, according to one prominent fixed-income analyst, author, and JPMorgan Chase vice president, “the yield curve tells the market what the market thinks of itself” (Choudhry 2004: 60). But what it says is not clear. In part, this confusion results from market players’ diverse time frames and preferences for risk.

Naming the variegated strategies and inclinations, other economic theories (of money substitution and market segmentation) suggest that looking to different time horizons leads investors to prefer one maturity of bond to others (see Choudhry 2004: 95). These theories rest on investors' preferences for bonds of particular durations and a demand for higher interest rates for the uncertainty they assume as time stretches forward. The U.S. government must compensate investors for increases in uncertainty as the future unfolds. However, basic market pressures also have an effect: preferences for short-term risk lead to high demand for shorter-term investments and therefore lower yields, lending the yield curve its normal shape.

In the temporal structure of academic approaches to the yield curve, history also has a role to play. The past enters as a set of former predictions. A yield curve inversion has preceded each recession since the mid-1960s (with the exception of one inversion). This record has led to economic studies assessing the yield curve's predictive abilities. Although the late 1980s marked the beginning of this wave of research, a brief survey of the extensive literature shows work on its predictions of gross domestic product growth (Ang, Piazzesi, and Wei 2006); "real" economic activity (consumption and investment) (Estrella and Hardouvelis 1991); recessions (Wright 2006); output and inflation (Kozicki 1997; Estrella 2005a); and the stability of the curve's predictive power (Estrella, Rodrigues, and Schich 2003). Glenn D. Rudebusch and John C. Williams (2007) assess its impressive track record for predicting recessions over the previous twenty years, a profile that beats the performance of professional forecasters.¹¹ The collective evaluation of the yield curve's past predictive record establishes the flat and inverted yield curves as forecasting tools for policy bodies, like the Federal Reserve, banks, and managers, or requires them to reason their rejection.¹²

Professional spheres, like academic economics, impose their own time requirements and also their own affects. The rational investor of economic theory's yield curve is matched by the detached affect of academic writing. More informal sites of communication offer the possibility of bringing together professionals with

11. Whatever the quality of the yield curve's predictive power, its history does not necessarily provide an argument for its present or future power. In an address to the Economic Club of New York, Federal Reserve chairman and former Princeton economics professor Ben Bernanke echoed his predecessor, Alan Greenspan, by explaining that he did not believe that the yield curve was as good a recession indicator as its history suggests. Shifting explanation for the U.S. Treasury curve beyond the nation's borders, Bernanke (2006) pointed to a historically unprecedented "global savings glut," anchored in Asia, which has been influencing recent yields.

12. For a comprehensive bibliography on the yield curve as an economic predictor, see Estrella 2005b.

distinct institutional, temporal, and affective demands. Blogs in particular offer financial professionals forums to go beyond their workplace constraints of feeling and time. Online, the financial public reflects on the power of the yield curve and speculates about the reasons for the curve's shape.

Public Commentary

Commentary on the yield curve's inversion links different temporal proclivities to virtual participants who may shape the yield curve. During the yield curve's inversion, the *Wall Street Journal* blog, Real Time Economics, reported on a Federal Reserve paper that lauded the curve's track record for predicting recessions (Izzo 2007). The posting sparked a wave of commentary that primarily fingered two financial actors to explain the yield curve's power to predict recessions, both with their own temporal and strategic goals.

Echoing the market expectations hypothesis, the figure of the well-informed, long-term investor rationally seeking returns with a large cache of capital explains the yield curve's continued persuasive predictive profile. These levelheaded, knowledgeable moneymen cannot be swayed by trends or economic flare-ups. Instead, their interests—the large sums of money they control—tie them firmly to reason.¹³ One commentator on Real Time Economics contrasted what he considered the distorted view of the insulated and arrogant expert, the econometrician, with the rational traders who he assumes shape the yield curve: “Why would anyone place more confidence in an econometric forecast than the dollar-weighted votes of those who actually control the world's capital?” (Wilson 2007). In other words, economic exchange not only cools the passions but also produces better information—an effect valuable for assessing the economic future.

Asian central banks have played another part in discussions of the inversion: distorting the curve and its information. Rich from thriving economies and backed by the aggressive savings of their workforces, the reasoning proceeds, Asian central banks are buying up the short end of the Treasury spectrum. The curve's inversion therefore reflects not “true” market sentiment but the age-defining nature of Asian economic growth. The following post sums up this popular interpretation:

I doubt that today with so much cash flowing into short term bonds that the yield curve reflects as much about our economic growth as it does

13. This characterization reflects the early political idea of economic exchange as “cooling” traders' more violent passions (Hirschman 1997).

China's. . . . The point here is that old trends placed [into] a model that fails to reflect the reality of today's global market, and the significance [of a] new and somewhat unfamiliar circumstance of influences, may produce more false positives than reliable forecast. (Unique Insights 2007)

When *The Big Picture*, a macroeconomics blog run by financial analyst Barry Ritholtz, dissected the December 2005 inversion of the yield curve, Asian central banks again appeared in an explanatory role, this time with a more sinister twist: "The critical question for long-term economic health is whether these foreign creditors are genuine savers or whether the liquidity being supplied us is primarily generated by Asian central banks with freshly printed yuan & yen" (Algernon 2005).

Suspicion of Asian banks suggests manipulative intent. The writer questions the authenticity of the Asian banks' strategy, implying that it does not rationally reflect an underlying economic condition (savings). Instead, he intimates that a monetary manipulation of the market (printing yuan and yen) is under way. In this argument about the shape of the yield curve, the rational, long-term investors' sincerity supporting the curve's predictive power conflicts with the duplicitous and distorting Asian presence in the U.S. Treasuries market.

Commentators also offer additional, anecdotal evidence to support the yield curve's power to predict a recession. Monthly economic reckonings at the household level offer selective evidence from ordinary people about the state of the economy. Family members often play central roles in these explanations, as in this example: "About those gas bill[s]? My mother is going to call the gas company because 'it must be wrong,' even though I have been telling her watch out" (me 2005). A mother's dismay and a son's caution frame the possibility of a recession in local and personal terms, anchoring the at-a-distance assessment of the yield curve in the particularities of consumers' daily realities. The yield curve, the comment suggests, not only reflects the sentiments of expert readers but also shifts with the distress of everyday American citizens battered by the hand of the U.S. economy.

Commentary on blogs joins formal theory in populating the yield curve with virtual traders. Explanations of the yield curve's bend ride on their temporalities, affects, and motivations. The uncertainties of the future together with the unpredictable influence of these virtual traders invite the play of affect and technical activity.

Conclusion: Reflexive Troubles

Powerful models like the yield curve focus investors' attentions around the globe, even as they pursue their varied financial goals and interests. The yield curve allows financial professionals to monitor one another's activities in the aggregate. The movement of American bond prices draws a potent collective judgment about the economic future. But the day's traders are not the only actors placing pressure on the curve's bend. Both formal economic theory and impressionistic, provisional explanations contribute to the yield curve's ability to speak the market's verdict. Models of market pricing, intertemporal risk, and investor behavior enter into the practice of credit trading through the curve's shape. As the yield curve crystallizes theoretical positions, it also defines a topography for trading. Dealers buy and sell with the yield curve's signals about the future in mind, weaving together theory and action.

Investors', traders', and planners' daily examinations and deals entwine a vision of the future with the reflexive character of the market: how the future looks depends on the collective inscription of bond prices, an assessment of risk and possibility that feeds into further judgments to buy and sell. Thus far the depiction hews closely to Giddens's (1990: 41) observations on economic reflexivity: formal knowledge, informal translations, and lay appropriation of economic concepts all contribute to the economy by shaping behavior, "creating a situation of continual mutual involvement between economic discourse and the activities to which it refers." Giddens also stresses that the expert knowledge that initiates technological systems does not stand solid. High modern practices of revision also carry an affective cost. That experts will likely alter their ideas creates an awkward uncertainty and existential discomfort. The yield curve, however, poses some challenges to this model of contemporary knowledge and its relation to affect.

In the yield curve and other models of the economic future, reflexive knowledge couples with the emergent organization of the market. The power of predictive instruments to provide a contour of the future relies on the constant involvement of a global trading collective. These inhabitants of the trading space bring the market into being moment by moment through their concerns, judgments, and deals. The yield curve describes this market in the continuously shifting price activity of U.S. debt offerings. Financial professionals experience this emergent character of markets as an integral part of their work. However, the anonymity it entails leaves them constantly guessing. Who is populating the market right now? What is compelling the strategies that are shifting the curve's shape?

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Some answers might lie in textbook explanations of yield curve movements that infer investors' intentions and time frames for action. However, these historically based readings cannot take into account the most current composition of the market, a makeup that continually changes. Experts hotly debate who is making the curve move and why. They may ascribe significance to the actions of Chinese bankers, reasonable hedge fund managers, or traders dealing on everyday Americans' financial concerns. Who they believe is making the curve move shapes opinion, not only about the market but also about the condition of their own knowledge. The reflexive emergence of financial models opens the corridor of doubt.

The interplay between reason and affect is productive: of market activity, of financial liquidity, and of the changing vision of the future around which financial professionals trade and plan. The importance of emotion is not that it enters at the limits of reason, as Keynes suggested, or as the complement to incomplete knowledge, as Giddens proposes. Rather, the high affects around the yield curve point to a conflict in the very composition of financial understanding and to an intractable problem of modern knowledge more generally. Professionals' engagements with the yield curve proceed through the uncertainties sustained in it, uncertainties about both the market players and the quality of the signal the curve offers.

The ability of the instrument to predict is always under question. Constant market changes transform the tool itself. Its meaning and effectiveness shift as financial and political conditions develop and as market participants move in and out. Tensions and doubts surround economic knowledge and its instruments as a pair. Financial understanding and activity work through these affects, not in opposition to them. The rationality of the market model is troubling because it depends on the rationality of its participants, provoking an urgent financial problem: how to read the future.

References

- Algernon. 2005. Comment on “Inverted yield curve: Its [*sic*] different this time (not),” by Barry Ritholtz. Posted on The Big Picture, December 27, www.ritholtz.com/blog/2005/12/inverted-yield-curve-its-different-this-time-not (accessed January 30, 2009).
- Allan, John H. 1978. Credit market analysts turn gloomy. *New York Times*, January 3.
- . 1979. A study of the Treasury yield curve: Plotting the curve. *New York Times*, April 15.
- Ang, A., M. Piazzesi, and M. Wei. 2006. What does the yield curve tell us about GDP growth? *Journal of Econometrics* 131: 359–403.
- Bernanke, Ben S. 2006. Reflections on the yield curve and monetary policy. Address to the Economic Club of New York, New York, March 20.
- Blumberg, Deborah Lynn, and Michael Hudson. 2007. Yield curve turns steeper as Treasuries rise sharply. *Wall Street Journal*, August 29.
- Chinn, Menzie. 2007. The world inverted: Does it matter that yield curves are sloping downward? Econbrowser, October 12, www.econbrowser.com/archives/2007/10/the_world_inver.html (accessed January 30, 2009).
- Choudhry, Moorad. 2004. *Analysing and interpreting the yield curve*. New York: Wiley.
- Cohen, Marilyn. 2000. *The bond bible*. Paramus, N.J.: Prentice-Hall.
- Dunbar, Nicholas. 2001. *Inventing money: The story of Long-Term Capital Management and the legends behind it*. New York: Wiley.
- Economist*. 1976. Finance and the marketplace. November 6.
- Estrella, Arturo. 2005a. Why does the yield curve predict output and inflation? *Economic Journal* 115: 722–44.
- . 2005b. The yield curve as a leading indicator: Frequently asked questions. Federal Reserve Bank of New York, www.ny.frb.org/research/capital_markets/ycfaq.html (accessed November 26, 2008).
- Estrella, Arturo, and Gikas A. Hardouvelis. 1991. The term structure as a predictor of real economic activity. *Journal of Finance* 46: 555–76.
- Estrella, Arturo, Anthony P. Rodrigues, and Sebastian Schich. 2003. How stable is the predictive power of the yield curve? Evidence from Germany and the United States. *Review of Economics and Statistics* 85: 629–44.
- Financial Times*. 2007. Reading the yield curve. April 3, search.ft.com/ftArticle?queryText=yield+curve&y=0&aje=true&x=0&id=070403011549&ct=0&nlick_check=1 (accessed October 17, 2007).

- Fischer, Michael M. J. 2003. *Emergent forms of life and the anthropological voice*. Durham, N.C.: Duke University Press.
- Giddens, Anthony. 1990. *Consequences of modernity*. Stanford, Calif.: Stanford University Press.
- Gross, Daniel. 2005. The dread “inverted yield curve”: It makes brave economists cower. *Slate*, December 29, www.slate.com/id/2133458 (accessed October 17, 2007).
- Hirschman, Albert O. 1997. *The passions and the interests*. Princeton, N.J.: Princeton University Press.
- Homer, Sidney, and Martin L. Liebowitz. 2004. *Inside the yield book: The classic that created the science of bond analysis*. Princeton, N.J.: Bloomberg.
- Homer, Sidney, and Richard Sylla. 2005. *A history of interest rates*, 4th ed. New York: Wiley.
- Izzo, Phil. 2007. Fed paper looks at yield curve–recession connection. Real Time Economics, August 29, blogs.wsj.com/economics/2007/08/29/fed-paper-looks-at-yield-curve-recession-connection (accessed January 30, 2009).
- Keynes, John Maynard. 2008. *The general theory of employment, interest, and money*. Israel: Beta Nu.
- Knorr Cetina, Karin, and Urs Breugger. 2000. The market as an object of attachment. *Canadian Journal of Sociology* 25: 141–68.
- . 2002. Global microstructures: The virtual societies of financial markets. *American Journal of Sociology* 107: 905–50.
- Knowledge@Wharton. 2006. Don’t sweat the inverted yield curve: No one really knows what it means. January 25, knowledge.wharton.upenn.edu/article.cfm?articleid=1362 (accessed October 17, 2007).
- Kozicki, S. 1997. Predicting real growth and inflation with the yield spread. *Federal Reserve Bank of Kansas City Economic Review* 82: 39–57.
- Lakoff, Andrew. 2008. The generic biothreat, or how we became unprepared. *Cultural Anthropology* 23: 399–428.
- Leberhz, James. 1978. Cracks start to show in long-term rates. *Washington Post*, September 24.
- . 1979. Treasury bond market. *Washington Post*, July 29.
- Lenoir, Timothy. 1998. Inscription practices and materialities of communication. In *Inscribing science: Scientific texts and the materiality of communication*, edited by Timothy Lenoir. Stanford, Calif.: Stanford University Press.
- Lowenstein, Roger. 2001. *When genius failed: The rise and fall of Long-Term Capital Management*. New York: Random House.

- Luhmann, Niklas. 1998. *Observations on modernity*. Stanford, Calif.: Stanford University Press.
- MacKenzie, Donald. 2006. *An engine, not a camera: How financial models shape markets*. Cambridge, Mass.: MIT Press.
- me. 2005. Comment on “Inverted yield curve: Its [*sic*] different this time (not),” by Barry Ritholtz. Posted on The Big Picture, December 27, www.ritholtz.com/blog/2005/12/inverted-yield-curve-its-different-this-time-not (accessed January 30, 2009).
- Mitchell, Timothy. 1998. Fixing the economy. *Cultural Studies* 12: 82–101.
- . 2002. *Rule of experts: Egypt, techno-politics, modernity*. Berkeley: University of California Press.
- Neal, Larry. 1992. Review of *A history of interest rates*, 3rd ed., by Sidney Homer and Richard Sylla. *Journal of Economic History* 52: 752–53.
- Preda, Alex. 2006. Socio-technical agency in financial markets: The case of the stock ticker. *Social Studies of Science* 36: 753–82.
- Rabinow, Paul, and Talia Dan-Cohen. 2006. *A machine to make a future: Biotech chronicles*. Princeton, N.J.: Princeton University Press.
- Roitman, Janet. 2004. *Fiscal disobedience: An anthropology of economic regulation in central Africa*. Princeton, N.J.: Princeton University Press.
- Rudebusch, Glenn D., and John C. Williams. 2007. Forecasting recessions: The puzzle of the enduring power of the yield curve. Federal Reserve Bank of San Francisco Working Paper Series 2007-16, www.frbsf.org/publications/economics/papers/2007/wp07-16bk.pdf (accessed October 17, 2007).
- Thau, Annette. 2000. *The bond book: Everything investors need to know about Treasuries, municipals, GNMA's, corporates, zeros, bond funds, money market funds, and more*. New York: McGraw-Hill.
- Unique Insights. 2007. Comment on “Fed paper looks at yield curve–recession connection,” by Phil Izzo. Posted on Real Time Economics, August 29, blogs.wsj.com/economics/2007/08/29/fed-paper-looks-at-yield-curve-recession-connection (accessed January 30, 2009).
- Wilson, Stephen Delos. 2007. Comment on “Fed paper looks at yield curve–recession connection,” by Phil Izzo. Posted on Real Time Economics, August 29, blogs.wsj.com/economics/2007/08/29/fed-paper-looks-at-yield-curve-recession-connection (accessed January 30, 2009).
- Wright, Jonathan H. 2006. The yield curve and predicting recessions. Finance and Economics Discussion Series, Divisions of Research and Statistics and

Public Culture

- Monetary Affairs, Federal Reserve Board, www.federalreserve.gov/pubs/feds/2006/200607/200607pap.pdf (accessed November 26, 2008).
- Wu, Tim. 2003. What makes the yield curve move? *Federal Reserve Bank of San Francisco Economic Newsletter*, no. 15, June 6.
- Zaloom, Caitlin. 2006. *Out of the pits: Traders and technology from Chicago to London*. Chicago: University of Chicago Press.