

1 APPRENTICESHIP

I came to Wall Street in 1970 while still finishing my doctoral dissertation for Cambridge University because I knew what I did *not* want to do. During the summers of 1965 and 1966, on either side of my first year at Cambridge, I had served as an intern for the Senate Finance Committee as LBJ's triumphant Great Society Administration began its catastrophic dissolution. I emerged from the experience permanently immunized against Potomac Fever.

In 1968 and 1969, I had worked nine-to-five in the Public Record Office in London's Chancery Lane, conducting primary research on the economic policies of the Labour government of 1929–1931. I expected that I would return from Cambridge to pursue an academic career in economics in the United States, so the following Christmas vacation I interviewed my way from my alma mater, Princeton, by way of Yale, to Harvard and MIT just before the academic job market was submerged by the deluge of graduate students whose scholarly ambitions had been intensified by the Vietnam War. In those slack market conditions, there was an opportunity available in each school's Economics department. The results of the interviews were uniformly positive, but each offer of employment came with a common curse that expressed itself in the suggestion that I might be more comfortable in a department of Politics or Government or History, rather than Economics.

The discipline of economics was then accelerating its transition to formal methods, mathematical models and quantitative techniques. Practitioners who did not deploy the toolkit, and topics that did not lend

themselves to quantitative analysis and mathematical rigor, were being nudged to the sidelines. In 1994, Paul Krugman, meditating on the marginalization of the great development economist Albert Hirschman, recalled how maps of Africa evolved beginning in the fifteenth century, when distances and coastlines were inaccurate but the interior was rich in details, some real (the great city of Timbuktu), some imaginary (“men with mouths in their stomachs”):

Over time, the art of map-making and the quality of information used to make maps got steadily better. The coastline of Africa was first explored, then plotted with growing accuracy, and by the 18th century that coastline was shown in a manner essentially indistinguishable from that of modern maps. Cities and peoples along the coast were also shown with great fidelity.

On the other hand, the interior emptied out. The weird mystical creatures were gone, but so were the real cities and rivers. In a way, Europeans had become more ignorant about Africa than they had been before . . .

Between the 1940s and the 1970s something similar happened to economics. A rise in the standards of rigor and logic led to a much improved level of understanding of some things, but also led for a time to an unwillingness to confront those areas the new technical rigor could not yet reach. Areas of inquiry that had been filled in, however imperfectly, became blanks.¹

My research agenda, the intersection of politics and economics at times of extreme financial crisis, lay in one of those blank spaces. It and I were both found wanting, informed as we were by Cambridge economics.²

I had been drawn to Cambridge in the first place by the magnetic power of Keynes (dead since 1946), whose legacy defined a distinctive approach to economic problems. In his preface to *The General Theory of Employment, Interest and Money*, Keynes wrote that “the composition of this book has been for the author a long struggle of escape”³ from the

¹ P. Krugman, “The Fall and Rise of Development Economics” (1994). Available at <http://web.mit.edu/krugman/www/dishpan.html>.

² More than thirty years later, I came to appreciate that there had been an opportunity to carve out an academic career that integrated economic theory, financial analysis and political history when I read what is still the most significant work yet published on the sources and dynamics of the Great Depression: B. Eichengreen, *Golden Fetters: The Gold Standard and the Great Depression, 1919–1939* (Oxford University Press, 1992).

³ J. M. Keynes, *The General Theory of Employment, Interest and Money*, in E. Johnson and D. Moggridge (eds.), *The Collected Writings of John Maynard Keynes*, vol. 7

“classical” paradigm of economics in which he had been educated. By the late 1960s, the classical paradigm had risen anew, now in formal mathematical garb, as neoclassical economics. But, committed to Keynes’s thinking under the tutelage of his leading student, Richard Kahn, I had come to read a deep philosophical message behind the Keynesian revolution in economic theory and policy, one that represented nothing less than an alternative statement of the purpose of economics. This statement turned on a radically different understanding of the nature of the world with which economists and their discipline engage.

I summarize now what I understood fifty years ago. Neoclassical economics concerns itself with analyzing how rational agents, endowed with relevant information, more or less efficiently allocate scarce resources. In this reading of the world, time is an ahistorical index of sequence that merely indicates the order in which events occur. Keynes’s economics, on the other hand, explores the decisions (and the aggregate effects of those decisions) made by people who know that they do not and cannot know enough about the future, but who will nonetheless suffer the consequences of whatever they decide. In Keynes’s reading of the world, time past is problematically comprehended history, and time future is a world of contingency and chance – and at the core of a capitalist economy are investment decisions that incorporate that uncertain future. As Keynes emphasized in *The General Theory*: “The outstanding fact is the extreme precariousness of the basis of knowledge on which our estimates of prospective yield have to be made.”⁴

Beginning in the mid-1950s, the “war of the two Cambridges” animated the discipline. By the late 1960s, as Krugman retrospectively observed, the war was over, unequivocally won by MIT and Harvard. Even to a research student in old Cambridge, this was clear. My interpretation was that Paul Samuelson’s neoclassical synthesis had accommodated the Keynesian revolution by sleight of hand. Success in the pursuit of economic efficiency by rational agents presumes that all available resources are fully employed at all times, and Keynesian macroeconomic policy was invoked to ensure that such would be the case. The Keynesian revolution, far from entailing the reconstruction of the foundations of economics, served as a handy footnote.

(Cambridge University Press and Macmillan for the Royal Economic Society, 1976 [1936]), p. xxiii.

⁴ *Ibid.* 149.

The “Bastard Keynesians” of new Cambridge, as Keynes’s student Joan Robinson provocatively called them, had appropriated the mantle of Keynesianism while abandoning the ontological core of Keynes’s thinking. Some fifteen years after I left academia, Hy Minsky summarized his indictment of Samuelson’s achievement: “the neoclassical synthesis became the economics of capitalism without capitalists, capital assets and financial markets.”⁵

I returned to Cambridge at the start of 1969 determined to complete my thesis and earn my doctorate, whatever its apparent irrelevance to mainstream economics. Beyond that, I only knew that I did not want to return to a dysfunctional Washington, and at the age of 26 I certainly did not want to keep going to school. And so, by unanticipated default, I entered the world that Keynes had described with such telling insight in the essential Chapter 12 of *The General Theory*: the world of the financial markets – that is, the world of Wall Street. I did not appreciate at the time that my four years at Cambridge had endowed me with advantages of great prospective value.

Most obviously, I had been mentally living in the world of 1929–1931, a period that had demonstrated the interdependence of the financial system and the market economy, as well as the occasional need each could have for state intervention at times of extreme stress. Beyond consideration of the content and context of macroeconomic policy, my study of that period also forced my attention to the microeconomics of bubbles and crashes. I later came to appreciate that the stock market boom that culminated in the Great Crash of 1929, and the Global Financial Crisis of 1931 that transformed a recession into the Great Depression, were previews for the movies we all lived through during the dotcom/telecom bubble of 1998–2000 and the Global Financial Crisis that began in 2007.

Thus I was already equipped with a peculiar set of framing concepts and historical metaphors when, in 1970, I stumbled into F. Eberstadt & Co., one of the numerous investment banking partnerships that peopled Wall Street in those days. Those concepts and metaphors have shaped my professional career for over forty years,

⁵ H. P. Minsky, *Stabilizing an Unstable Economy* (New Haven, CT: Yale University Press, 1986), p. 120. Paul Davidson, the doyen of post-Keynesian economists, has developed this critique with vigor; see P. Davidson, *John Maynard Keynes* (New York: Palgrave Macmillan, 2007).

proving extraordinarily relevant at critical moments. They have also motivated me to observe and engage with the evolving disciplines of economics and finance, even while standing apart from the academic mainstream for a generation and while deploring the intellectual and institutional chasm that opened up between economics and finance after Keynes's death.

From Old Wall Street to New

In 1970, Wall Street was run by a generation who had grown up under the shadow of the Crash of 1929 and the Great Depression. In 1937, the New York Society of Security Analysts was founded; only three graduates of the Harvard Business School went to work on Wall Street; and Richard Whitney, recent past President of the New York Stock Exchange (NYSE), went to jail for stealing his clients' money.⁶ Thirty-three years later, the Generation of 1937 was in charge. They hardly noticed that 1970 was also the year when the National Association of Security Dealers agreed to create NASDAQ in order to automate the trading of stocks that could not qualify for the NYSE.

The structure of Wall Street in 1970 reflected three institutional facts. First, prior to that year, all member firms of the NYSE were required to be general partnerships, which entailed unlimited financial liability for their principals and limited access to external capital. Second, the NYSE maintained a schedule of fixed brokerage commissions that all member firms were required to charge their clients. Finally, the Glass-Steagall Act of 1933, separating the business of commercial banking from that of investment banking, was the law of the land. As one relevant metric of that institutional landscape, when in 1970 I chose not to pursue the chance to start in the bullpen at Morgan Stanley (it would have meant giving up my pursuit of a Cambridge doctorate when it was almost within grasp), the firm had some 250 employees and total capital of \$7.5 million; the equivalent numbers forty-seven years later were 56,000 employees and \$254 billion.⁷

⁶ “Adam Smith,” *The Money Game* (New York: Random House, 1967), p.10.

⁷ R. Chernow, *The House of Morgan: An American Banking Dynasty and the Rise of Modern Finance* (New York: Atlantic Monthly Press, 1990), pp.585–586, and Morgan Stanley, Form 10-Q for the quarterly period ended June 30, 2017, p.5.

Still sheltered from competitive pressures, the commercial bankers of the day were a dull lot, generally confined to taking deposits and making loans. The first signs of their awakening to new opportunities could just be discerned in the unintended consequences of the Johnson Administration's attempts to protect the dollar against the threats posed by the financial demands of the Vietnam War. As a direct response to US financial protectionism, the "Eurodollar" markets emerged in London. There, dollars that had accumulated offshore in consequence of growing deficits in the US balance of payments with the rest of the world could be freely borrowed and lent. In these markets, American commercial banks competed as underwriters of loans, unconstrained by domestic legislative and regulatory barriers.

The investment bankers of Wall Street served collectively as the agents for their clients – corporate, institutional and retail. They bought and sold securities and other financial assets, underwrote new issues of debt and equity, and advised on corporate strategy and merger and acquisition transactions. They were structured in a well-defined hierarchy. At the top of the heap were the white-shoe corporate advisory firms, led by the bulge-bracket lead managers of quality underwritings: Morgan Stanley; First Boston; Kuhn, Loeb; and Dillon, Read. These firms, in turn, enforced a strict ranking of status among their lesser counterparts that was published to the world in the order in which the firms appeared in the tombstone advertisements that accompanied every public offering of securities.

The retail-oriented firms, led by Merrill Lynch, distributed new securities and aggregated demand and supply for existing ones through more or less national networks of brokers; they were called wire houses because their branch offices were linked to the trading floor by telegraph (yes, still!) and telephone wires. The block trading firms – Goldman Sachs, Salomon Brothers, Bear Stearns – had the brains and the guts to put their own (still quite modest) capital at risk on behalf of their clients and themselves. They were below the salt, with the increasingly clear exception of Goldman, whose rise to respectability reflected more than thirty years of labor by Sidney Weinberg to overcome the taint left by its exploitation of its customers in the stock market bubble of the 1920s. And literally hundreds of niche partnerships thrived, subsidized by the NYSE commission schedule to compete for business by any means other than price.

As Chernow notes in *The House of Morgan*, the traditional "religious segregation" of Wall Street was "crumbling" but still

visible.⁸ By and large, the leading advisory firms in the Street remained WASP, with the exception of Kuhn, Loeb (whose past preeminence was plainly fading). The trading powerhouses were Jewish. Merrill, with its sales army known as “We, the People,” was Irish. It was barely possible to meet an Italian-American outside the mailroom in any of them. Professional women were virtually nonexistent in the established firms: Muriel (“Mickie”) Siebert was the first woman allowed to buy a seat on the NYSE, at the peak of the bull market in the late 1960s, and she had to start her own firm to have a place from which to trade.

The culture of Wall Street was a holdover from the days when the brokers were big and the clients were small. The canonical story went back to before the Great Crash, and every new entrant heard it. I was told it this way: in, say, 1928, a fellow from, say, Indianapolis came to New York with his wife and visited an old college pal in the latter’s skyscraper office downtown. His friend escorted them to a window and showed them the sights: “There’s Mr. Hutton’s yacht; there’s Mr. Dillon’s yacht; and there, *there*, is *Corsair*, Mr. Morgan’s yacht.” “Yes,” the visitor replied, “but where are the customers’ yachts?”⁹

As late as 1967, *The Money Game* – an account of the great postwar bull market, which is in equal measure insightful and hilarious – depicted a culture that in its essence was recognizably continuous with that of generations past, despite such institutional intrusions as the Securities and Exchange Commission (SEC). In his focus on brokers doing well by servicing new institutional clients from a fee schedule that harked back to another era, author “Adam Smith” (George Goodman, a former Rhodes Scholar in disguise) identified the force that would obliterate old Wall Street.

After World War II, the architecture of finance in the United States was transformed by the rise of investing institutions. Institutional investors had existed since time immemorial: the trust departments of banks, the investing side of insurance companies, the investment trusts

⁸ Chernow, *The House of Morgan*, p. 581.

⁹ Forty years later, I discovered a chronicle of pre-World War II Wall Street whose title demonstrates the persistent power of the joke: *Where Are the Customers’ Yachts? or A Good Hard Look at Wall Street*. In his introduction to the 2006 edition, Jason Zweig backdates the story all the way to Newport, Rhode Island, on a “summer day, probably in the 1870s”: J. Zweig, Introduction to F. Schwed, Jr., *Where Are the Customers’ Yachts? or A Good Hard Look at Wall Street* (Hoboken, NJ: John Wiley, 2006 [1940]), p. xv.

(closed-end funds) organized by brokers to aggregate their clients' capital. What drove structural transformation was the postwar institutionalization of savings, first through the broad emergence of defined-benefit pension plans, encouraged by amendments to the tax code, for both private- and public-sector employees. In parallel, newly founded open-end mutual funds competed for retail investors who were gradually emerging from the shadow of the Crash and the Depression. This was the source of the growing weight of the block trading firms, who provided liquidity to customers who had to trade in scale.

The growth of the institutional equity market was the counterpart to the long bear market in bonds that set in after World War II. This was partly a function of the fact that, contrary to popular fears and the conventional wisdom of most economists, the end of the artificial demands of military mobilization did not return the world to the conditions of the Depression: rather, economic growth drove profits and real incomes into a golden age of broad-based prosperity.

Unlike the aftermath of previous great wars – the Napoleonic Wars, the Civil War and World War I – in the United States, as in the United Kingdom and across Europe, the inflation of war was not followed by postwar deflation. In the first instance, this was directly the result of far wiser techniques of public finance in both the United States and Britain, which had relied on comprehensive rationing and direct industrial controls to divert resources to the war effort while protecting the build-up of voluntary and forced savings from dissipation by unconstrained price increases.¹⁰ A commitment to full employment and sheer growth in the scale of the public sector to serve commitments to both social and – with the onset of the Cold War – national security were accompanied by a persistent, gradual inflation that continued after an uncorrected spike during the Korean War.

In 1959, anticipating and accelerating the future, three young men – Bill Donaldson, Dan Lufkin and Dick Jenrette – had started a firm (DLJ) to implement a great idea. As the post-World War II bull market in common stocks increasingly drew investors out of the extended, anti-equity trauma of the Depression, they all had to pay the fixed NYSE

¹⁰ Arguably, the single most productive contribution to the formulation of public policy ever made by Keynes was through his 1940 pamphlet “How to Pay for the War: A Radical Plan for the Chancellor of the Exchequer,” whose precepts were substantially followed in Britain and the United States: J. M. Keynes, *Essays in Persuasion*, in Johnson and Moggridge (eds.), *Collected Writings*, vol. 9, pp. 367–439.

commissions. Previously, competition for business had involved a number of noneconomic factors – old school ties and the “three Bs” (booze, babes and baseball tickets) prominent among them. DLJ competed for business by offering documented recommendations for stock purchases and (less commonly) sales on the basis of fundamental investment research; this was novel and needed. It was the first firm to define itself as a research brokerage, and it was followed by many others. In 1972, *Institutional Investor* magazine – its own existence emblematic of the new structure of finance – inaugurated an annual “All America” ranking of institutional research analysts.

Between autumn 1973 and spring 1975, old Wall Street entered an accelerating process of irreversible change. The first shock came with the oil embargo of September 1973. Inflation rates and interest rates soared to levels not previously experienced in peacetime. By the summer of 1974, Watergate had paralyzed Washington just when Wall Street both needed help and knew that it did. Nixon was in the bunker, the Watergate Committee was closing in, and the Dow Jones Industrial Index, which had tried and failed three times to hold steady above the iconic 1,000 level, was falling back toward 500.

The bear market that began in the fall of 1973 provided the context for the structural reforms that would transform Wall Street over the next generation. But the underlying cause of these reforms was the reversal of position between the Street’s agents and their customers. As brokers, Wall Street firms had become small relative to their institutional clients. And as investment bankers, they had become small relative to their premier corporate clients – AT&T, DuPont, GE, GM, IBM – which had become sufficiently substantial to access the capital markets on their own. In the commercial paper market, the great business corporations created a new capital market as they lent their excess cash to each other.

The transformational reform for the brokerage business took place on May 1, 1975: May Day. The NYSE suspended its fixed commission schedule, and member firms were free to negotiate with their customers. For most firms, negotiating with a pension fund was easy: just say “yes” to whatever rate the client proposed. And so brokerage commissions began their monotonic descent from more than 20 cents per share on an institutional-size, 10,000-share block toward zero.

Seven years later, the SEC confirmed the transformation of the world of corporate finance by promulgating Rule 415, allowing shelf

registrations for qualified issuers, who could thus avoid the expense of underwritten offerings by putting registered securities “on the shelf” to be sold when demand presented itself at an acceptable price. Each policy initiative reduced the rewards available for Wall Street firms acting as agents and generated powerful incentives for them to reposition themselves as principals.

The narrative of Wall Street’s evolution since 1970 confirms that one abiding law of history is the law of unintended consequences.¹¹ Deregulation of the capital markets beginning in 1975 achieved its intended result. It brought vastly improved transactional efficiency, represented most visibly by a radical decline in brokerage commissions and an enormous increase in trading volumes. But it also radically reduced informational efficiency. When the subsidy from brokerage commissions disappeared, fundamental investment research evolved from being a public good openly offered by the brokers and dealers on the sell side to become a proprietary asset of the buy side, held by managers of financial assets: pension funds and mutual funds to hedge funds.

Moreover, the changes revolutionized the institutional structure of the financial markets. Institutional investors who demanded the best execution from their brokers at the lowest net price spawned a set of bigger, smarter, tougher counterparties who made unimaginably more money as principals than they ever could have as agents. In parallel, under pressure from leading theorists and practitioners, the regulators unleashed capital market competition from its post-Great Crash shackles. Liberated from unlimited liability and more or less insured against liquidation by deposit insurance or the lender-of-last-resort powers of the Federal Reserve, Wall Street’s banks enjoyed a position on the risk–reward spectrum never before experienced in the history of financial capitalism. Enabled by advanced computer technology and modern finance theory, they were free to construct an infinite web of derivative securities in which every player had the opportunity to become too systematic to fail lest the circle of issuers and purchasers be broken at any link.

Wall Street’s transformation expressed itself through the progressive securitization of one asset class after another, beginning with

¹¹ R. K. Merton, “The Unanticipated Consequences of Purposive Social Action,” *American Sociological Review*, 1(6) (1936), p.903.

mortgages around 1980. Financial instruments that had been held on the books of the originating creditor became tradable securities, so the prices at which they traded became subject to the same dynamics of bubble and crash that characterize all markets in securities. As principals in the markets they had invented, the players in the new Wall Street rendered themselves utterly dependent on the presumption of liquidity in the markets in which they dealt. That is, they had to rely on the ability to transform any asset into cash at a predictable, historically consistent cost (funding liquidity) and on the continuity of trading in the markets where the assets they held were priced (market liquidity).

Here is a critical instance of the dependence of practice on theory. Theory asserted that the statistical attributes of the instruments the Wall Street firms bought and sold – their average return, their volatility, the correlation of return and of volatility among different securities, and especially their liquidity – could be relied on to be stable over time, and that cash would always be available on predictable terms. My practice as an apprentice venture capitalist would teach me that Cash and Control – assured access to sufficient cash in time of crisis to buy the time needed to understand the unanticipated, and sufficient control to use the time effectively – is the joint hedge against the inescapable uncertainties of economic and financial existence. The big banks and their regulators chose theory over practice as long as they could and were validated by Alan Greenspan's Federal Reserve when market reality challenged them, as it did in the 1987 stock market crash; in the Asian Flu, the Russian default and the collapse of the hedge fund Long Term Capital Management in 1998; and in the bursting of the dotcom/telecom bubble in 2000.¹²

This intellectual construct enabled the excesses of 1929 to be emulated, even exceeded, eighty years later. The great financial institutions acted as though sufficient cash would always be available whenever needed, and in 2008, for the first time in three generations, they brought the capitalist system to its knees when they discovered that only institutions of the state could deliver the cash they needed to survive.

¹² Perry Mehrling has published a deeply insightful analysis of the parallel development of the theoretical “economics” and “finance” views of how markets work, and of the abandonment of the practitioner’s “money view,” which emphasizes problematic access to liquidity as the hinge on which markets turn: P. Mehrling, *The New Lombard Street: How the Fed Became the Dealer of Last Resort* (Princeton University Press, 2010).

The Transformation of F. Eberstadt

How Wall Street transformed itself from a private club of highly paid agents into an enormously more profitable band of dealers resonates with the narrative of how my colleagues at F. Eberstadt and I were forced to evolve from investment banking agents into venture capital principals. In each instance, competitive pressures forced innovation on those who had enjoyed the economic rents provided by membership in a closed cartel. One decisive difference, however, was that F. Eberstadt was not too big to fail. We knew that in time of need our survival would depend on access to the cash owned by our best clients. So we learned to do what we had to do in order to deserve access to that cash.

I lived through and, to some degree, led the transformation of the institutional research business during the ten years that followed 1975's May Day. The Eberstadt firm possessed a remarkable endowment with which to face the new era. It had been founded in 1931, just as the Great Crash turned into the Great Depression, by a great financier, Ferdinand Eberstadt. In the early 1920s, Clarence Dillon, the original "Wolf of Wall Street," had recruited Eberstadt to the investment banking firm of Dillon, Read. Eberstadt led Dillon, Read to play a major role in refinancing German industry after the losses of World War I and the hyperinflation of 1922. As the peak of the bull market approached toward the end of the decade, he suggested to Dillon that his partnership share might be increased to reflect more closely his contribution to the firm's profits. According to Eberstadt, Dillon responded, "You're not happy here, are you?"

So, in 1928, Eberstadt was freed to play a leading role in the drafting of the Young Plan (named for Owen Young, then chair of General Electric), a collaborative, quixotic effort to reduce to manageable scale the burden of reparations established at the Versailles Peace Conference in 1919. Eberstadt completed this pro bono assignment and returned to Wall Street at the worst imaginable time. In 1930, he put his considerable capital into one of the then major wire houses, Otis and Company, which closed its doors less than two years later with unlimited liability to its partners. Eberstadt literally walked across the Street and, with \$15,000 and some used furniture proffered by friends such as Averell Harriman, started his own firm, determined that no one else would ever again have the opportunity to lose his money.

During World War II, Eberstadt returned to the public sector, first as head of the Army/Navy Munitions Board and then as Vice Chair of the War Production Board. At the latter he directed the implementation of the Controlled Materials Plan, a conceptually brilliant and operationally effective tool for directing the mobilization of American industry for total war by controlling the physical allocation of three critical inputs: steel, aluminum and copper.¹³ After the war, the Eberstadt Report on America's national security architecture led directly to the founding of the National Security Council and the passage of the National Security Act of 1947, which created the Department of Defense.

In my father's chronicle of the industrial mobilization that led to Allied victory, *The Struggle for Survival*, Eberstadt emerges as the only heroic figure other than FDR himself. He was a

financier intimately acquainted with the workings of industry, a magnate frankly sympathetic with the claims and contributions of labor, a remarkably blunt and forceful character of scholarly attainments and penetrating intellect, an administrator able to master endless detail and yet to formulate comprehensive and workable over-all policy.¹⁴

With regard to Eberstadt the man, I had the best of both worlds. I knew him from my boyhood, and he was a mentor to me until his death. He instilled in me the idea that Wall Street and Washington were and are ever locked into mutual interdependence. The libertarian bankers who despise the idea of government interference in any economic or financial activity are as suicidally unrealistic as those political entrepreneurs who do not appreciate that every public policy is inevitably subject to the direct or indirect test of the financial markets' temperament.

It was Eberstadt who, in conjunction with my father, led me to focus my doctoral research on the formulation of economic policy in time of crisis. Eberstadt exemplified in one person the game played between the practitioners of financial capitalism and those who control

¹³ More recent research has called the relevance of the Controlled Materials Plan into question: J. Landon-Lane and H. Rockoff, "The Paradox of Planning: The Controlled Materials Plan of World War II," Historical Working Paper 83, National Bureau of Economic Research (May 1996). See also M. R. Wilson, *Destructive Creation: American Business and the Winning of World War II* (Philadelphia: University of Pennsylvania Press, 2016), pp.143–144.

¹⁴ E. Janeway, *The Struggle for Survival: A Chronicle of Economic Mobilization in World War II* (New Haven, CT: Yale University Press, 1951), p.312.

the apparatus of the state. Through his firm, he operated effectively in the game played between the market economy and the sources of finance. On the other hand, I never actually worked for Eberstadt and so was never subject to his dictatorial rule.

When Eberstadt died, in 1969, at the age of 79, he was still Managing Partner of his firm. To the end, he held a morning meeting every day, where each partner reported what he had done in the previous twenty-four hours and how he proposed to pass the next twenty-four. This was not an environment in which a new generation of entrepreneurial leaders was likely to thrive; indeed, many of his partners left to pursue their own destinies over the years. Fortunately, shortly before his death, Eberstadt agreed to a recapitalization of the firm that created at least the opportunity for it to survive his own demise.

Because of his genius and despite his need for absolute control, Eberstadt left behind three franchises. The firm's investment banking team sponsored emerging companies that he liked to call his "baby blue chips." The team advised the companies on strategy, negotiated mergers and acquisitions on their behalf, and raised debt and equity capital for them in the financial markets. The second franchise, Chemical Fund, was a phenomenon. It was the first mutual fund to be started after the Crash of 1929 and the first to focus on the new science-based growth industries, starting with chemicals and moving on to pharmaceuticals, then electronics and computing. Not coincidentally, it was also the first mutual fund to reach \$1 billion in assets under management. Through the mid-1970s, Chemical Fund's management fees could be counted on to cover the firm's basic operating expenses. Third, and least in prominence, was an institutional research brokerage business that had been spun off from Chemical Fund and had a similar focus.

Eberstadt also left behind a set of senior partners who proved unable to defend, let alone renew, the first two franchises. By the late 1970s, virtually all of the firm's inherited investment banking clients had been poached. And Chemical Fund, which had built its outstanding investment record on long-term holdings of the great postwar engines of growth and innovation – DuPont and Pfizer, IBM and Xerox – followed these and the other "Nifty Fifty one-decision" stocks over the cliff and into the abyss of the 1973–1975 bear market.

That the firm had a future at all was the work of two men. Pike Sullivan and Ed Giles had joined with Eberstadt's son-in-law in the early 1960s to launch the firm's institutional research business.

The son-in-law gave up waiting for the succession, but Sullivan and Giles stayed on as Eberstadt's most junior partners in the part of the firm most removed from him. Sullivan built and ran the firm's sales and trading activities. He possessed a remarkable, if inarticulate, instinct for stock selection. He executed a simple analytical construct by dividing the world and its contents into a two-by-two matrix: one dimension ranged from the "simple" to the "complicated" and the other ran from the "real" to the "remote." The secret of management, whether of investments or of the firm, was to live to the maximum extent possible in the quadrant that was both simple and real, and to avoid all that was both complicated and remote.

Giles had joined Eberstadt as Chemical Fund's chemical analyst and had recruited the research team for the institutional business. He combined deep knowledge of the dynamics of the first science-based industry with insatiable curiosity about the context in which its industrial participants operated and in which their securities were valued. In contrast to Sullivan, Giles would habitually lead an audience through a complex and nuanced discussion of the global chemical industry or some particular segment of it and punctuate each stage of the argument by saying: "Do you follow me? Well, it's not that simple!" They made a formidable team.

As their seniors followed their failing franchises down and out, Sullivan and Giles inherited the opportunity to reinvent the firm around the research core. In 1979, they took the decisive step of selling the remains of Chemical Fund to Marsh & McLennan, then owner of the Putnam Group of mutual funds. Those partners who went with Chemical Fund received compensation for their Eberstadt interest entirely in Marsh & McLennan stock. Those who were invited and chose to take the risk of a restart received a portion in such liquid form and the balance in the stock of "new Eberstadt," the first explicitly defined "research-based investment banking firm."

The idea was simple. Since the institutional clients would no longer pay us enough in commissions for us to earn a worthwhile return on our investment in research, we had to generate other income streams. Three were available. All depended on repurposing the research team from generating commissions on the trading desk to generating fees from corporate clients: strategy advice, mergers and acquisitions, and corporate finance. The tight focus of the firm's research on the "high IQ" industries meant that the small group of investment bankers, whose

purpose was to leverage the knowledge and insights of the research analysts, had no choice but to go native into the chemical, healthcare and emerging IT sectors. At a time when the major Wall Street firms would not let analysts near their corporate clients for fear they might say something “smart” and undermine the relationship, our model turned on the analysts telling the bankers where to go and what to do.

Mastering the Pragmatics of Finance

During the half-dozen years of old Eberstadt’s unwinding, I had been engaged in absorbing the basics of the business as an apprentice in the investment banking department. And the firm had enough business in the early 1970s to provide a comprehensive education in corporate valuations, public offerings of debt and equities, and merger and acquisitions transactions, including hostile takeovers. The most fundamental lesson arose from the most mundane of work: the valuation of private companies, a reliable fee-generating practice.

I learned to pursue parallel but methodologically independent approaches. First, one would project forward estimates of future cash flows, discounting them back at a rate judged to reflect an appropriate level of idiosyncratic risk specific to the perceived stability of the business and its competitive position, as well as to market rates of interest. In the language of the new finance theory just being propagated, this defined the “fundamental,” as if only one such number could be generated and as if all interested parties would agree on it. In practice, alternative approaches were invoked. One would identify more or less comparable public companies, then introduce market metrics such as price/earnings and market/book value ratios, making appropriate adjustments to reflect the particulars of each company in question. Finally, one would estimate the likely net realization from a hypothetical sale of the business, having due regard for “what a willing buyer would pay a willing seller, neither under any compulsion to transact.”

The layers of judgment embedded in each of these methodologies for valuating companies were as evident then as they are now. In a financial universe transformed institutionally beyond imagining from that of the early 1970s, the same techniques remain central to the discipline, and they are just as dependent on judgment as ever,

regardless of the reservoirs of data and massive computing power brought to bear.¹⁵

Such valuations were and are typically used in court, or at least subject to legal review, when they are needed to help settle an estate or for tax purposes. I learned that the professional goal was to manage each of the processes so the resulting numbers would be within approximately 10 percent of each other: farther apart, and the disparity would threaten the edifice of legitimizing objectivity; too close, and the coincident accuracy would raise suspicions. Practice drove any belief in a single, verifiable fair or fundamental value out of my brain long before I seriously thought through the theoretical impossibilities of the Efficient Market Hypothesis and its assertion that market prices could be relied on to represent accurately that fair and fundamental value.¹⁶

I was fortunate to learn so early in my career the value of viewing the “fundamental” – a central building block of modern finance theory and neoclassical economics alike – with suspicion. Application of such skepticism faced in two directions. With respect to financial assets, the anchor of a value around which prices are supposed to fluctuate is itself a problematic entity, subject to divergent opinions and estimates. The same stance applies to the calculations that rationalized investment in the physical assets of the so-called real economy – and more so to the extent that those assets embodied innovative technology.

Of course, individual cases are situated along a spectrum that runs from relative continuity and predictability to outright ignorance. At one extreme, in 1970, AT&T functioned as a legislated monopoly that controlled the pace at which essential services would be extended and new technology deployed. Because its revenue and cash flow grew monotonically, it could reliably forecast the return it would generate from any new investment. And its shareholders, informed by a stated and rigorously maintained dividend payout policy, could predict the

¹⁵ See, for example, the recommended deployment of exactly this set of methodologies in order to value contemporary “Unicorns,” private companies valued at more than \$1 billion: Houlihan Lokey, “Determining the Fair Value of Unicorn Securities,” June 2017. Available at <https://www.hl.com/us/insightsandideas/12884902393.aspx>.

¹⁶ For rigorous, analytical assaults on the Efficient Market Hypothesis that cover thirty years, see S. J. Grossman and J. Stiglitz, “On the Impossibility of Informationally Efficient Markets,” *American Economic Review*, 70(3) (1980), pp.393–408, and H. Pesaran, “Predictability of Asset Returns and the Efficient Market Hypothesis,” in A. Ullah and D. E. Giles (eds.), *Handbook of Empirical Economics and Finance* (Boca Raton, FL: Chapman and Hall / CRC, 2010), pp.281–312.

return they would receive. At the other and more sporty end of the spectrum were, and are, the host of start-ups venturing into the economic and financial unknown and unknowable.

Years later at Warburg Pincus, I would instruct my team that they were allowed to run one instance of a financial model of a start-up to check for logical consistency, but if they insisted on running more instances in the hope of defining the prospective rate of return, we would not do the deal. The parameters of such a model were necessarily so soft that any net present value of expected future cash flows could readily be generated.

Understanding that the fundamental is an uncertain construct, even when applied to an established and ostensibly secure business, has strategic importance. At a systemic level, it forces recognition of the waste that must be generated by any process of economic development and growth through time. Schumpeter's process of creative destruction can only proceed by trial and error. We see that which is created through the lens of survivors' bias and ignore the "hopeful monsters" that economic evolution has spawned and left behind in metaphorical emulation of Darwin's process of natural selection. No doubt every one of them was launched on the basis of an exercise in forecasting future revenues, costs and an expected value to be compared with a rough estimate of the cost of capital. As Schumpeter well knew, the wastage is the measure of the inescapable uncertainty that attends the practice of doing capitalism:

We need only visualize the situation of a man who would . . . consider the possibility of setting up a new plant for the production of cheap aeroplanes which would pay only if all people who drove motorcars could be induced to fly. The major elements in such an undertaking simply cannot be known . . . Neither error nor risk expresses adequately what we mean.¹⁷

Inventing the "Post-venture Private Placement"

All of this seemed to be decoupled from the institutional research business through the mid-1970s. But, as impossible as it may be to conceive

¹⁷ J. A. Schumpeter, *Business Cycles: A Theoretical, Historical and Statistical Analysis of the Capitalist Process* (London: McGraw-Hill, 1939), vol. 1, p.100.

of today, it was possible then to live multiple professional lives in an investment firm like Eberstadt. So, while I was being paid as an apprentice, then journeyman investment banker, I continued to write and lecture on the increasingly fraught state of the domestic and global political economies. In particular, during the winter of 1973–1974, when Wall Street generally held Watergate to be a partisan political sideshow, I was speaking and writing on its economic consequences. My thesis was that Nixon’s loss of authority would cripple the government’s ability to meet the need for political underwriting of the financial and economic risks that the first oil shock was generating. The game between the state and the market economy of 1931, which I had explored in depth during my years at Cambridge, had returned, if this time only as a shadow and a warning. The persistent relevance of that warning reaches forward as well as backward. In 2008, it was precisely the authority of those in charge of states from Washington to Beijing by way of London and Berlin that put a floor under the Global Financial Crisis. In 2017, even as the prices of financial assets continue to reflect the extraordinarily low discount rates that are the result of extraordinarily unconventional central bank monetary policy, we may confidently expect financial consequences from the loss of credible leadership in Trump’s White House and Brexit’s Downing Street. And they will not be pretty.

Around 1975, my work in this domain attracted the attention of Ed Giles. He asked me to produce regular research reports on the political economy, to be published as part of the firm’s offerings to our institutional clients. In this back-door manner, I had the opportunity to align myself with the “smart guys” in the firm as the old investment banking franchise into which I had been hired was fading away. By the time we split up the firm in 1979, I was working increasingly closely with key members of the research team on specific opportunities to generate investment banking deals, and with Giles and Sullivan on developing the business model for the new firm.

The most economically significant new business that we created in new Eberstadt was what we called post-venture private placements, the sale of unregistered securities by emergent companies to institutional investors. This business proved to be as good as the market for initial public offerings (IPOs) was bad. Understanding this dynamic is crucial. The public equity markets exist to provide liquidity to investors who can correct an investment error by selling the shares back to the market. But

liquidity in any market is fragile and vulnerable. It is subject to two different threats: one-sided market opinion and the existence of categories of securities that are deemed too risky for trading.

If market opinion is heavily one-sided and investors are united in the belief that a given share or the market as a whole can move only in one direction – the conditions that enable a bubble or a crash – then the premium or discount that an investor must pay or can receive will be large. Under extreme conditions of panic, as in the autumn of 2008, the discount may become infinite. As Keynes wrote in *The General Theory*: “Best of all if we should know the future. But, if not, then ... it is important that opinions should differ.”¹⁸ Precisely because no one can know the value of the fundamental for sure, markets offer liquidity as those with different opinions bid and offer prices that correspond to their differing views. So, at a fundamental level, uncertainty explains why financial markets exist in the real world.

As for the second threat, there have been repeated episodes when whole categories of securities – for example, debt securities of governments that have defaulted on their obligations – have been deemed too risky for trading. Most relevant to my own career and to the dynamics of the Innovation Economy, there are times when the common stock of new companies is judged unsuitable for introduction to the public market. Generally, when aversion to perceived risk is high and bear market conditions prevail, the IPO window closes. Such were market conditions after the oil shock of 1973 and through the remainder of the 1970s. During those years, the number of venture-backed companies that managed to go public was very small. A few names stand out: Cray Research (1976), Tandem Computer (1977) and Federal Express (1978).

At roughly the same time, we discovered at Eberstadt that we could mobilize large sums of capital – tens of millions of 1980-vintage dollars, worth slightly more than three times as much today – in order to fund the sort of emerging company that in normal times would have gone public. In 1980, when the first \$100 million venture fund was just being raised (by my present firm, Warburg Pincus, as it happens) and when the typical IPO amounted to only \$10 million in aggregate proceeds, this was real money. The basis of the business was the relationship of trust that Eberstadt had established with a highly diverse set of

¹⁸ Keynes, *General Theory*, p.172.

our best institutional clients: ranging from the State Farm Insurance Company, to private investment advisory firms around the United States, to various branches of the big Swiss banks and members of the private banking confraternity in Geneva, to the Scottish investment trusts. These relationships, in turn, reflected underlying economic self-interest: because these investors were so important to the overall revenues of our firm, they knew that we could not afford to exploit them.

The terms of these private placements reflected a balance of issues. On the one hand, by sponsoring a company, we were certifying its post-venture status as a revenue-generating business delivering (or soon to deliver) positive cash flow from operations. This was instantiated by the form of the equity securities our clients bought: straight common stock, underneath the convertible preferred shares typically purchased by venture capitalists. Of course, this subordination was powerfully attractive to the entrepreneurial founders and the venture capital backers of the issuers. On the other hand, the price our clients paid reflected the scarcity of capital and the lack of liquidity.

One of our early successes was a medical device company called IMED, a leader in computer-based pumps to control the intravenous infusion of fluids and drugs. When we sold shares to our clients, the company already had annual revenues of \$35 million, and it was growing at some 30 percent per year with an operating profit margin of 20 percent. We valued the company at \$50 million, perhaps half or less of the valuation freely traded shares of a comparable company would have received in the public market under less stressed conditions. Barely two years later, Warner-Lambert bought IMED for \$465 million in cash.

An echo of the Eberstadt post-venture financing business could be heard in the pseudo-market that has emerged from 2010 around the most visible exemplars of the consumer-oriented internet that are still privately held. The purchase of shares without SEC registration by passive investors has a passing resemblance to our innovation of more than thirty years ago. The one clear link is the absence of an active IPO market. The primary difference is valuation: the buyers of these shares have been paying premium prices, as if they had the certainty of liquidity that only a deep trading market can provide. By deep contrast, our post-venture private placements were typically priced at a 40 per cent or even greater discount to the valuations of roughly comparable public companies.

As I write in 2017, the Unicorn Bubble appears to be fading, as a growing number of companies that have succeeded in going public trade below their previous private valuations. Underwritten by the historically unprecedented, sustained low levels of real interest rates that have been the consequence of excessive reliance on central bank ease through the painfully long recovery from the Global Financial Crisis and the Great Recession, the Unicorn Bubble is doubly vulnerable: at the micro-level, to the “marks to reality” generated by active trading markets for those companies that do go public; at the macro-level, from a return to traditional levels of interest rates and credit spreads as the major central banks normalize monetary policy. Even before such confrontation with reality, a recent detailed analysis of the individual funding rounds of 135 asserted Unicorns indicates that the valuations of all were exaggerated by not accounting for the specific favorable terms offered later-stage investors that detract from the value available to earlier rounds and to the underlying common shares held by founders and employees:

We value unicorns using financial terms from legal filings and find reported unicorn post-money valuations average 50% above fair value, with 15 being more than 100% above. Reported valuations assume all shares are as valuable as the most recently issued preferred shares. We calculate values for each share class, which yields lower valuations because most unicorns gave recent investors major protections such as . . . IPO return guarantees (14%), vetoes over down-IPOs (24%), or seniority to all other investors (32%). Common shares lack all such protections and are 58% overvalued. After adjusting for these valuation-inflating terms, almost one-half (65 out of 135) of unicorns lose their unicorn status.¹⁹

But the collapse of the Unicorn Bubble poses no systemic risk, given that in aggregate the funds involved are relatively modest and unleveraged.

As always, the majority of hopeful monsters will fail while a few amazing winners will again demonstrate the power of productive bubbles to finance innovation at the frontier. As well, the entrepreneurs and

¹⁹ W. Gornall and I. A. Strebulaev, “Squaring Venture Capital Valuations with Reality,” National Bureau of Economic Research Working Paper 23985, October 2017, abstract. Available at <http://www.nber.org/papers/w23895>. Interestingly, because its last-round investors received minimal protections (as they no doubt have cause to regret), Uber – the most highly valued of all Unicorns – enjoyed one of the smallest discounts from reported to “fair value” before Softbank’s Vision Fund established a mark to reality 40% below the previous round.

directors of the 250 or so currently existing Unicorns will discover that there is a fundamental difference between meeting operating expenses with proceeds from the sale of goods and services versus from the issuance of securities to inevitably fickle investors. And, finally, a set of former fund managers at major institutions who drove the bubble will discover the lesson that I learned at first hand during my apprenticeship on old Wall Street. When liquidity is available, escape from error is available, even if a loss must be accepted. When liquidity is not available – whether by reason of contract or law or an adverse change in market conditions – the path to redemption is laborious work, at best, as Virgil said of the return from hell.