

1 | The Edwardian Explosion

The period from around 1880 to 1910 saw the emergence of radically different ways of organizing and carrying out economic activity. The consequences both for economic well-being and the wider sphere of political economy were dramatic, so we will begin by exploring the developments during this period in some detail.

The eminent biologist Stephen Jay Gould coined the phrase “the Cambrian explosion” for the period some 550 million years ago when, suddenly, dramatic new life forms surged into being. After an immense length of time during which life had existed in only its simplest forms, far more complicated creatures came into existence. Most prospered for a while and then failed. But the legacy was the path of evolution that has led eventually to humanity.

Similarly, in the economic world, the decades around 1900 saw massive companies emerge for the first time, bringing entirely new management problems in terms of co-ordinating and organizing the operations of these vast entities. In British social history, this is known as the Edwardian period, after Queen Victoria’s son who himself reigned in the opening decade of the twentieth century, a period when the British Empire dominated the world. So perhaps I might be permitted a trace of nostalgia in describing the events of this period, so important to the future development of capitalism, as the “Edwardian explosion.”

During these few decades, we can see forms of organizing economic activity fall by the wayside as firms struggled to understand and adapt to the rapidly changing environment. Yet, at the same time, the survivors from this turbulent age were successful on a scale entirely without precedent. The modern world of huge multinational companies, so familiar to us now, was essentially

created during this period. Globalization is a hot topic in the early twenty-first century, but its foundations were laid a century before.

The single most useful and productive legal invention in the past few centuries has been that of the commercial firm. Individuals have banded together and pooled their resources in the pursuit of business since time immemorial, but the massive economic expansion of the past two hundred years is based on the modern concept of the company. Financed by outside shareholders and facing limited liability, this new way of organizing the production of goods and services has transformed the world. The firm is the *Tyrannosaurus rex* of economic activity, a hugely successful species that sweeps all before it.

We can identify two features of the company that make it qualitatively different from all previously existing ways of conducting business. Each is important in its own right, but combined their joint impact is greater than the sum of the individual components. Both had been invented prior to the final quarter of the nineteenth century. But it was during this period that the overall conditions became right for a dramatic transformation of the economic environment based on them.

The first feature is the idea of attracting outside investors into the venture. By itself, this is not particularly new. Wealthy individuals have always been willing to put money into the ideas of talented and resourceful people known to them. Much of the world's great art and music, for example, was financed by private donations from the rich. What is different about the modern firm is that the investment is essentially anonymous. Shareholders do not need to know personally the entrepreneurs in order to part with their money. Of course, with start-up companies or small firms looking for finance to expand, a prudent investor will insist on finding out a great deal about the individuals concerned, while a fund manager looking to move a big block of shares between, say, Microsoft and GM may well think quite hard about the key individuals on the boards of these giant companies. But there has been a massive expansion in the amount of information available

to investors about what is on offer. Companies can and do solicit new funds from individuals who are completely unknown to them at the time, and this new form of organization increases dramatically the potential funding for any individual enterprise.

The second feature, or evolutionary step as we might think of it, is the invention of limited liability. Individuals no longer need risk personal bankruptcy when they organize a commercial venture. Indeed, one may feel that this particular quality has recently taken an evolutionary step too far. Managers, facing no personal risk whatsoever, reap spectacular rewards for failure—failure with other people's money. A form of corporate theft has been perpetrated in many cases.

But this latter is a very recent phenomenon, and the contribution of the concept of limited liability has been hugely positive. All business decisions involve risk. The degree of risk may vary enormously, but no one knows for certain what will happen once a decision is taken. The limit placed on liabilities facilitated an explosion of innovation and entrepreneurial activity. Individuals were released from the constraint of, quite literally, having to bet the family ranch on a new business venture.

Of course, out in the thickets of the commercial world, different species, different forms of corporate organization survive, each with its own niche. Some can be very successful. Goldman Sachs, for example, has been one of the most profitable, dynamic and innovative financial institutions in the world in recent decades. And for most of this time, it was an antiquated partnership, fashioned on the same organizational principles as those of the bankers who financed Europe's monarchs in medieval times. In both cases, the potential rewards were huge. On the downside, however, the entire personal wealth of each individual partner was, in principle, at risk every single day.

The dominant life form for more than a century, however, has been that of the limited liability company. Like the dinosaurs, this took time to reach its full evolutionary potential. The massive dinosaurs that ruled the world did not spring up entirely from nothing. In the same way, the concepts of anonymous outside

investors and limited liability were not invented in the final quarter of the nineteenth century. But, suddenly, underpinned by these concepts, the conditions became right for a massive step forward in the evolution of firms. Companies grew stupendously, to sizes that were entirely without precedent in human history. At the turn of the nineteenth century, large corporations were being built on an enormous scale, mainly due to a massive wave of mergers and acquisitions. By the first decade of the twentieth century, for example, U.S. Steel employed more than 200,000 workers, a number simply beyond the imagination of previous generations.

U.S. Steel was admittedly by far the largest company in the world at that time. Its total assets in 1917, for example, were no less than \$2,449 million. Translating this into modern prices is not straightforward because so many things have changed since then, but an approximation would be a value of some \$400 billion. For comparison, the value of Microsoft is currently around \$300 billion. So U.S. Steel was big by any standards.

But many other American companies had assets of over \$100 million, with eleven more companies in exactly the same industrial sector as U.S. Steel—"primary metal industries" in the dry jargon of economic statistics. The industry of "transportation equipment" had been made up of locomotive and ship manufacturers until the beginning of the twentieth century, but as early as 1917 the largest firm in this sector was already the new Ford Motor Company, with assets of \$165 million. In third place in this list was another familiar name, that of General Motors. Elsewhere in the economy, giant corporations had sprung into existence. The food sector, for example, was headed by Armour and Co. and by Swift and Co., each with assets of over \$300 million. Both of these became extinct as independent firms in the 1970s and 1980s, respectively. DuPont and Union Carbide were the largest producers of chemicals, and Standard Oil of New Jersey the biggest oil company, with assets of over \$500 million.

The success of the large company, far more efficient and productive than anything that had gone before, was instrumental in consolidating the political success of capitalism, itself a

relatively new form of economic life, which had evolved gradually from its feeble initial stirrings in the Europe of the sixteenth and seventeenth centuries.

Living standards had been improving gradually during the nineteenth century. There is a bitter and intense debate, seeming to stem as much from ideology as from objective scholarly dispute, about whether average living standards rose or fell in the early decades of the Industrial Revolution, up until around 1840. But all are agreed that from around that time life improved. The number of hours worked per week were reduced, health began to improve along with life expectancy as people could afford to buy more food and hence consume more calories, and more and more products appeared in the shops which came within the reach of ordinary people.

Nonetheless, life was undoubtedly still pretty grim for most people. Again, comparisons across such a long period of time are difficult to make, since the whole structure of the economy and the mix of goods and services that are now available have altered dramatically. Most of the purchases made today are of products which simply did not exist a century or more ago. Air travel is an obvious example, but the inventiveness of capitalism knows no bounds. As I write these words, I read in the newspaper of a German savaged almost to death by his pet Rottweiler. He was attempting to give it fresher breath by brushing its teeth. Confronted by doctors telling him he was lucky to be alive, the man moaned plaintively, "I can't understand it, I used a special canine toothbrush." We can be certain that special canine toothbrushes were not generally available in the shops of the late nineteenth century.

Despite the difficulties, economists and economic historians have made great efforts to compare living standards over time. As a broad generalization, we might say that the average person in Western Europe in 1880 was as well off as, say, the typical Indonesian today. If anything, the European of that time was slightly worse off, but the comparison is not unreasonable. The threat of famine, persistent for millennia, was starting to fade into

memory and surplus cash was becoming available to spend on things other than the bare necessities of life. But work was long and hard, support from the state at times of personal hardship was weak or nonexistent, and the environment in the cities was badly polluted, far more so than it is today.

If living standards had not improved any further, it is easy to believe that the appeal of a political platform dedicated to the revolutionary overthrow of capitalism would have grown. The stupendous cornucopia that capitalism was to unleash in the twentieth century in terms of material standards of living, health and life expectancy across the planet could scarcely be imagined. In any event, that was just speculation about the future rather than the bleak reality of actual experience.

However, the success of the newly evolved life form of the large company gave a huge boost to the quality of life in the period from 1880 to the First World War. The average standard of living in America rose by 50 percent. In France and Germany the increases were 50 and 60 percent, respectively, and in Britain, the wealthiest of the major countries in 1880, incomes rose by a further 40 percent. As a result, the attraction of a revolutionary change faded away. Apart from brief insurrections in the aftermath of the First World War, capitalism has remained unchallenged in the West throughout the twentieth century. Only in Russia in 1917 do we have an example of the overthrow of the system.

This period of immense political and economic significance for the future of both the West and the world in general also saw the rise of a new political species, namely the social democratic party. Despite the rhetoric, these parties were effectively committed not to the elimination of capitalism, but to a modified version of the system. Their true nature was revealed for all to see by the First World War itself. A small minority urged the workers of Europe to resist the war. In contrast, the great majority of social democrats everywhere threw themselves with enthusiasm into their national struggles. A leading revolutionary, Rosa Luxemburg, attacked the role of social democratic parties in vituperative terms a few days before her assassination in the turbulent political atmosphere of

Germany of December 1918: “In all previous revolutions, the combatants faced each other openly, class against class, program against program. In the current revolution, the troops protecting the old order are not intervening under the banner of the ruling class, but under the flag of the social democratic party.” But from the perspective of the people they represented, the social democratic leaders were acting in an entirely rational way. Capitalism was delivering the goods.

Returning to the purely economic aspect rather than the wider political economy of this period of dramatic change, our knowledge of the emergence of the massive company in the decades around 1900 has been expanded enormously by the work of Alfred Chandler, an economic historian at Harvard. His magnum opus, *Scale and Scope: The Dynamics of Industrial Capitalism*, charts in great detail the development of large firms in America, Britain and Germany, the three biggest economies of the world at the time.

The pace of innovation and evolution of economic organization was rapid, matched by a wave of extinctions as older, less efficient structures failed to survive in the new environment. Consumers today are quite accustomed to the idea of the prices of new products and services falling dramatically; for example, computer hardware, software and telecommunication products have all seen sharp falls in price combined with better-quality products. Exactly the same phenomenon was observed in the cutting-edge industries of the late nineteenth century. Their products were distinctly less exotic than the electronic-based wave of today, but then, as now, new ideas revolutionized production. The German dye manufacturers Bayer, Hoechst and BASF were able to reduce the price of a new synthetic dye from 270 marks a kilo in 1869 to just 9 marks by 1886. Less efficient producers were simply swept aside.

The period saw a veritable explosion of different types of industrial structure. Managers and owners searched and explored a wide variety of strategies in the pursuit of success in the rapidly changing environment. Many were tried, only to be discarded rapidly. Large-scale investment in new machines and factories and rapid technological innovation in many industries in the 1870s

and 1880s brought success for some and great benefits to the consumer. But success came at a price to the companies themselves. Competition intensified and prices fell. The example of synthetic dye is an extreme example of what happened in what was then a very high-tech industry. But even in well-established industries such as textiles and iron, innovation led to lower prices. And lower prices meant lower profits.

A widespread response, in both Europe and America, was to make formal agreements between companies, enforced by trade associations. Chandler notes that in the American hardware industry alone, which had many highly specialized product lines, no fewer than fifty trade associations managed the market for firms. These associations set quotas for output, fixed prices and allocated different regions to different companies. The intense level of competition and innovation threatened the very existence of many firms, and the initial response was to band together to manage and control this frightening new beast. Competition gave way to collaboration.

But the policy of attempting to manage competition through cartels organized by trade associations pretty quickly failed. Essentially, there was no effective mechanism of policing the agreements on prices and output. Each individual member of an industry cartel faced a strong incentive secretly to cut prices to gain business. And once one firm had broken ranks, the others were compelled to follow suit, if they could. The less efficient were forced out of business because they were unable to make profits at the new, lower levels of price, and profits were lower than they were for those who survived.

It was always tempting for an individual to break the cartel, with the eventual result that all participants in the agreement ended up worse off. This conflict between what we can think of as individual and collective rationality is one which we will encounter again in Chapter 5 when we discuss game theory. It was in the collective interests of firms to maintain the cartel, but individual firms often came to believe that they themselves would be better off by breaking it.

This failure of the structure within individual industries was soon reinforced in the United States by powerful external pressure. The Sherman Antitrust Act of 1890 not only made such combinations illegal but provided the federal government with the authority to enforce this through the courts.

The next response from industry was a massive wave of mergers and acquisitions, in which many companies simply disappeared into huge new conglomerates. The attempt to deal with the intensity of competition by forming trade associations to police behavior had failed. Instead, competition was simply reduced by firms eliminating rivals by merging them into a single organization.

In part, this dramatic reduction in the number of major players in each market was triggered by another piece of legislation, the general incorporation laws passed by the state of New Jersey in 1889. General incorporation laws—the very phrase triggers a colossal thud of boredom in the minds of most people. But astute business people realized that they provided a way round the fundamental problem facing trade associations, namely, the incentive for any individual member to renege in secret on the deal and to cut its prices. The precise details of the laws need not concern us, but they gave ingenious companies the means with which to enforce legally the intra-firm agreements on prices and output.

The main pressure toward the elimination of rivals by merger and acquisition was, however, the continued interest of legislators in restricting any form of agreement or collusion between individual firms. This was a major theme in American domestic politics in the decades leading up to the First World War.

This merger movement, by far the largest of its kind up to that time, lasted from around 1895 to 1905. During that time, it is estimated that 3,012 firms, most of them of substantial size, disappeared because of mergers. The value of the consolidated firms which emerged as a result totalled almost \$7 billion, or well over \$1,000 billion at today's prices.

Consider the corporate world on the eve of the First World War. Firms had sprung up which were of wholly unprecedented size. For the first time ever, individual companies both could and did

operate not just on a continental, but on a global scale. This new and dramatic phenomenon attracted the attention of a shy English academic who was probably the most innovative and influential economist in the world at the time.

Alfred Marshall spent most of his life cloistered in the rooms of St John's College, Cambridge. Trained originally as a mathematician—indeed, he was placed second in the whole university in his final exams—he switched his attention instead to economics. His *Principles of Economics*, revised through many editions, became what was probably the dominant book in the rising discipline of economics in the early decades of the twentieth century. He was instrumental in persuading a new Cambridge intellectual star, John Maynard Keynes, to focus on economics.

Despite his apparent other-worldliness, Marshall was an acute observer of contemporary economic and business life. His *Principles* are littered with insights, some elaborated at length, others merely mentioned in passing, which remain interesting and thought-provoking even today. An important question that Marshall considered was: How long will these new giant firms live? His interest in this matter is instructive to many economists today. Rather than busy himself with abstruse theoretical models whose assumptions lack empirical validation, Marshall, like all the great economists before him, was concerned to try to answer questions that illuminated the main economic issues of the day. He was more than capable of formulating theoretical models, as his early prowess as a mathematician testifies, but he regarded them as tools to help understand how the world works. The emergence of the giant corporation was a new phenomenon, which required analysis and understanding.

Marshall revised and altered his opinion on the survival of mega-corporations in successive editions of his *Principles*. In the first edition, published in 1890, he argued that, like trees in the forest, there would be large and small firms but “sooner or later age tells on them all.” But by the sixth edition in 1910, his view had changed. It is during these two decades, remember, that the truly massive companies had emerged. Perhaps a little star-struck by

their sheer size, Marshall then opined that “vast joint stock companies . . . often stagnate, but do not readily die.” He believed that these new firms were qualitatively different from the nineteenth-century firms on which he based his previous generalization.

With the benefit of hindsight, we can see that, in this particular case, even Homer nodded. Marshall’s original insight of 1890 has proved to be much nearer the truth than his revised opinion of 1910. Even giant firms fail.

Much of our information on the experiences of these companies in the twentieth century comes from two impressive and detailed studies by the American sociologist Neil Fligstein and the British economic historian Leslie Hannah. Fligstein’s book, *The Transformation of Corporate Control*, provides evidence on the lives of the 100 largest companies in America at the end of each decade from 1919 to 1979. Hannah’s article* traces the survival of the world’s 100 largest industrial companies in 1912 through to 1995.

In recent years, the collapse of corporate giants such as Enron or WorldCom has caught the headlines in a spectacular way, with investors avidly searching for scapegoats. The level of skepticism about the pronouncements of companies has risen. In many ways, this is a healthy sign. As I write these words, for example, it emerges that the oil company Shell has overstated its proven oil reserves by 25 percent. A byword for boring conservatism, the company grew complacent and arrogant. The chairman, Sir Philip Watts, has already been compelled to resign, and the market value of the company has fallen by over \$15 billion in less than two months. No fewer than four chairmen of FTSE 100 companies, all previously senior executives of Shell, are amongst those being pursued in the U.S. courts for damages arising from the misstatement of reserves.

Despite this recent bout of skepticism, most commentaries about the business world continue to eulogize success. But as Hannah

* L. Hannah (1999), “Marshall’s ‘Trees’ and the Global ‘Forest’: Were ‘Giant Redwoods’ Different?” in N. R. Lamoreaux, D. M. G. Raff and P. Temin (Eds), *Learning by Doing in Markets, Firms and Countries*, National Bureau of Economic Research.

notes laconically, “The tendency to overemphasize successes, and to rationalize them *ex post* is chronically endemic amongst business historians and management consultants.” The latter group are particularly prone to the temptation of claiming to have found the unique formula for business success. Books proliferate, and occasionally sell in very large numbers, which claim to have found *the* rule, or small set of rules, which will guarantee business success. But business is far too complicated, far too difficult an activity to distil into a few simple commands, be it the ‘set price equal to marginal cost’ of economic theory, or some of the more exotic exhortations of the business gurus. It is failure rather than success which is the distinguishing feature of corporate life.

We see the survivors, and their triumphs are lionized. But the failures remain virtually forgotten. Hannah’s list of the world’s largest industrial companies in 1912 contains familiar names: Procter & Gamble, Siemens, General Electric and, yes, Royal Dutch Shell, to give the currently afflicted company its Sunday-best name. But there, too, is Briansk Rail and Engineering, not long for this world after the Bolshevik seizure of power in Russia in 1917. And Hohenlohe Iron and Steel of Germany along with Central Leather and Cudhay Packing in the United States. Gone. Gone and forgotten.

Fligstein’s evidence is less detailed than Hannah’s for our immediate purposes, though it contains much interesting material. His data set does not include evidence on whether a firm failed completely and ceased to exist as an independent entity. Rather, it focuses on whether or not a company was in the list of the largest 100 U.S. firms at the end of each decade from 1919 to 1979. Only 33 out of the top 100 in 1919 remained in the list in 1979, and since then the attrition amongst the survivors has continued.

Fligstein notes that no fewer than 216 companies in total made it into the U.S. top 100 over the sixty-year period. Some, such as Bethlehem Steel, WF Woolworth, Chrysler and Goodyear Tire and Rubber were in the list for the entire period. Others enjoyed their fifteen minutes of fame in a single appearance, such as Atlantic

Gulf and West Indies Shipping Line in 1919, Lehigh Valley Coal in 1929, Climax Molybdenum in 1939, Allied Stores in 1949, Kaiser Steel in 1959, International Utilities in 1969 and, anticipating the future, Rockwell International in 1979. International Business Machines (IBM) makes its first appearance in 1939, but otherwise computing firms such as Microsoft are absent, simply because for the most part they barely existed at the last date on Fligstein's list, 1979.

On average, over the individual decades from 1919–29 to 1969–79, 78 out of the top 100 at the start of any decade were still there at the beginning of the next. But no fewer than 22 out of 100 were not. These are, or rather in most cases were, the giants of American capitalism. Operating on a massive scale, and possessed of enormous resources, almost one in every four were unable to remain in the top 100 for more than a decade.

Hannah's evidence takes us to a more recent date, 1995, and shows not only when firms merely dropped out of the world's top 100 but also when they ceased to exist as independent concerns.

The companies in the world's top 100 in 1912 represented the cream of capitalism. These were the survivors of a brutal era of competition and had successfully survived the massive wave of mergers around the turn of the century. As Hannah points out, "They were, on the whole, firms that contemporary stock-market analysts considered attractive and safe because of their consistently reliable record of generous but sustainable dividends. A population of the largest firms of ten years earlier would almost certainly show earlier exits and faster rates of decline than this population." In short, these were the blue-chip companies of their time. The value of the smallest, in stock-exchange prices of 2004, was \$5 billion, and of the largest \$160 billion. Yet within ten years, ten of them had disappeared as independent concerns. Fitness, in the form of huge assets and years of successful operation, proved no guarantee, not merely of continued success, but of their very survival. Their experiences over the period 1912–95 are summarized in Table 1.1.

TABLE 1.1 Performance of the world's largest 100 industrial companies in 1912 over the period 1912–95 (*Source*: Hannah, 1999)

Bankrupt	29
Disappeared	48
Survived	52
Remained in top 100 in 1995	19

The period 1912 to 1995 is not much longer than the average life expectancy of a human being. Of course, life expectancy was shorter in 1912 than it is now, but many members of the middle class born in 1912, with their greatly superior diet, better housing and less arduous working conditions, could quite reasonably have expected to live until 1995. So, within the span of a human lifetime, each of the twenty-nine companies that became bankrupt squandered many billions of pounds in shareholders' funds. Money that existed as the value of the shares in these companies vanished to nothing. How hard is it to spend so much money? For an individual, there are only so many apartments in Manhattan and Mayfair you can buy, only so many great works of art, only so many private jets and yachts. Yet no fewer than 29 out of the world's top 100 companies in 1912 succeeded in making stupendous sums of money disappear.

In total, 48 out of the top 100 disappeared as independent entities, and only 28 were larger in 1995 than they were in 1912. A small number of the companies, such as Procter & Gamble and BP, were very much larger, expanding shareholder value by a factor of at least seven. But these were the exception rather than the rule. Disappearance or decline was almost three times as likely as growth. Because of my own background, I am often asked by would-be entrepreneurs seeking escape from life within huge corporate structures: "How do I build a small firm for myself?" The answer seems obvious: buy a very large one and just wait.

We do know that the average lifespan of small firms is shorter than very large ones, but this is accounted for almost entirely by relatively high death rates in the very early years of existence. The offer, launched with such excitement and anticipation, turns out to be not quite right for the intended market. And, unlike a large company, the very small firm is not diversified. The failure of its main product means the end of the firm itself. At a more elementary level, the owners of the firm may simply get their cash flow wrong and not be able to meet in time the demands of ruthless predators such as the tax authorities. But, after the first few years of existence, the difference between large and small firms' survival potential narrows dramatically. Their prospects of surviving the next year become more or less the same. And, eventually, age claims them. Most firms fail.

We can see this from the very dawn of the modern age. The spread of printing in Europe in the late fifteenth and early sixteenth centuries was one of the greatest technological leaps ever made, with an impact far more dramatic and pervasive than that of the internet. Information and knowledge could now be disseminated widely for the first time in human history, freed at last from the constraints of the need to transcribe scripts by hand in order to make a copy. Intellectual ferment and fervour was at its height in the Italy of the Renaissance, and nowhere more so than in Venice, center of a vast network of international trade. In 1469, twelve companies were engaged there in the new activity of printing, but by 1472 nine of them had failed.

Moving to more modern times, the domination of the world car market by a relatively small number of very large firms seems an immutable fact of life, but between 1900 and 1920 there were almost 2,000 firms involved in automobile production in the United States. Over 99 percent disappeared. Likewise, Hollywood now bestrides the world of film-making, yet in the 1900s the European film industry exported throughout the world, at times supplying half the U.S. market. By 1920, however, European films had virtually disappeared from America and had become marginal in Europe.

Both the evidence from the first giant wave of mergers around 1900 and the experiences during the twentieth century of the great success stories that emerged from it are entirely typical of the patterns of behavior traced by firms. They innovate; they respond creatively to changes in their external environment; they strive not merely to survive but to succeed. Some do, but for the most part they fail.

This chapter has looked at how hard it is to build successful long-term businesses. Firms have to operate in the uncertainties of the market. In the next chapter, we examine what economics has to say about markets, firms and how they behave. We will see that economic theory neglects almost completely the widespread existence of corporate failure. It has a great deal to say, not about what firms actually do, but what they ought to do in order to succeed. And we will see that the most widely quoted recipe for success taught in the economics textbooks is, in many real-world situations, a prescription for failure.