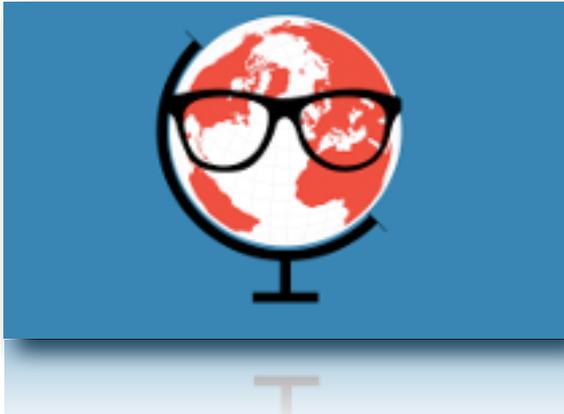


The spectacular power of *Big Lens*

How one giant company will dominate the way the whole world sees.



If you have been wearing glasses for years, like me, it can be surprising to discover that you perceive the world thanks to a few giant companies that you have never heard of. Worrying about the fraying edge of motorway lights at night, or words that slide on the page, and occasionally spending a fortune at the opticians is, for many of us, enough to think about. And spectacles are unusual things. It is hard to think of another object in our society which is both a medical device that you don't want and a fashion accessory which you do.

Buying them, in my experience anyway, is a fraught, somewhat exciting exercise that starts in a darkened room, where you contemplate the blurred letters and the degeneration of your visual cortex, and ends in a bright, gallery-like space where you enjoy the spry feel of acetate in your fingers, listen to what you are told, pay more than you were expecting to, and look forward to inhabiting a new, slightly sharper version of your existing self.

The \$100bn (£74bn) eyewear industry is built on feelings such as this. In the trade, the choreography that takes you from the consulting room to the enticing, bare-brick display of £200 frames is known as "*romancing the product*". The number of eye tests that turn into sales is the "*capture rate*", which most opticians in Britain (or optometrists, as they are known in the rest of the world) set at around 60%.

During the 20th century, the eyewear business worked hard to transform a physical deficiency into a statement of style. In the process, optical retailers learned the strange fact that for something that costs only a few pounds to make (even top-of-the-range frames and lenses cost, combined, no more than about £30 to produce), we are happy, happier in fact, when paying 10 or 20 times that amount. "*The margins,*" as one veteran of the sector told me carefully, "*are outrageous.*" The co-founder of *Specsavers*, Mary Perkins, is Britain's first self-made female billionaire.

Almost everyone wears glasses at some point in their lives. In developed countries, the rule of thumb is that around 70% of adults need corrective lenses to see well. In Britain, that translates to some 35 million people. But it's hardly a topic of national conversation. To the casual observer, the optical market also presents a busy and confusing sight. In Britain, thousands of independent opticians rub alongside a few big retail chains such as *Specsavers*, *Vision Express* and *Boots*. The wall displays in even a small, local optician hold several hundred frames, metal, acetate and rimless, while posters advertise a range of lenses with sciencey-sounding properties – "*freeform*", "*photo-fusion*", "*reflex vision*" – and names so bland they are hard to remember even when you are looking straight at them. But what we see masks the underlying structure of the global eyewear business. Over the last generation, just two companies have risen above all the rest to dominate the industry. The lenses in my glasses – and yours too, most likely – are made by *Essilor*, a French multinational that controls

almost half of the world's prescription lens business and has acquired more than 250 other companies in the past 20 years.

There is a good chance, meanwhile, that your frames are made by *Luxottica*, an Italian company with an unparalleled combination of factories, designer labels and retail outlets. *Luxottica* pioneered the use of luxury brands in the optical business, and one of the many powerful functions of names such as *Ray-Ban* (which is owned by *Luxottica*) or *Vogue* (which is owned by *Luxottica*) or *Prada* (whose glasses are made by *Luxottica*) or *Oliver Peoples* (which is owned by *Luxottica*) or high-street outlets such as *LensCrafters*, the largest optical retailer in the US (which is owned by *Luxottica*), or *John Lewis Opticians* in the UK (which is run by *Luxottica*), or *Sunglass Hut* (which is owned by *Luxottica*) is to make the marketplace feel more varied than it actually is.

Between them, *Essilor* and *Luxottica* play a central, intimate role in the lives of a remarkable number of people. Around 1.4 billion of us rely on their products to drive to work, read on the beach, follow the whiteboard in biology lessons, type text messages to our grandchildren, land aircraft, watch old movies, write dissertations and glance across restaurants, hoping to look slightly more intelligent and interesting than we actually are. Last year, the two companies had a combined customer base that is somewhere between *Apple's* and *Facebook's*, but with none of the hassle and scrutiny of being as well known.

Now they are becoming one. On 1 March, regulators in the EU and the US gave permission for the world's largest optical companies to form a single corporation, which will be known as *EssilorLuxottica*. The new firm will not technically be a monopoly: *Essilor* currently has around 45% of the prescription lenses market, and *Luxottica* 25% of the frames. But in seven centuries of spectacles, there has never been anything like it. The new entity will be worth around \$50bn (£37bn), sell close to a billion pairs of lenses and frames every year, and have a workforce of more than 140,000 people. *EssilorLuxottica* intends to dominate what its executives call "the visual experience" for decades to come.

The creation of *EssilorLuxottica* is a big deal. It will have knock-on consequences for opticians and eyewear manufacturers from Hong Kong to Peru. But it is also a response to an unprecedented moment in the story of human vision – namely, *the accelerating degradation of our eyes*. For several thousand years, human beings have lived in more or less advanced societies, reading, writing and doing business with one another, mostly without the aid of glasses. But that is coming to an end. No one is exactly sure what it is about early 21st-century urban living – the time we spend indoors, the screens, the colour spectrum in LED lighting, or the needs of ageing populations – but the net result is that across the world, we are becoming a species wearing lenses. The need varies depending where you go, because different populations have different genetic predispositions to poor eyesight, but it is there, and growing, and probably greater than you think. In Nigeria, around 90 million people, or half the population, are now thought to need corrective eyewear.

There are actually two things going on. The first is *a largely unreported global epidemic of myopia, or shortsightedness*, which has doubled among young people within a single generation. For a long time, scientists thought myopia was primarily determined by our genes. But about 10 years ago, it became clear that *the way children were growing up was harming their eyesight*, too. The effect is starkest in east Asia, where myopia has always been more common, but the rate of increase has been uniform, more or less, across the world. In the 1950s, between 10% and 20% of Chinese people were shortsighted. Now, among teenagers and young adults, the proportion is more like 90%. In Seoul, 95% of 19-year-old men are myopic, many of them severely, and at risk of blindness later in life.

At the same time, across the developing world, a slower and more complex process is underway, as populations age and urbanise and move indoors to work. The history of eyewear tells us that people do not, as a rule, start wearing glasses because they notice everything has gone a little out of focus. It is in order to take part in new forms of entertainment and labour. The mass market in spectacles did not emerge when they were invented, in 13th-century Italy, but 200 years later, alongside the printed word in Germany, because people wanted to read.

In 2018, an estimated 2.5 billion people, mostly in India, Africa and China, are thought to need spectacles, but have no means to have their eyes tested or to buy them. “The visual divide”, as NGOs call it, is one of those vast global shortcomings that suddenly makes sense when you think about it.

Across the developing world, straightforward myopia and presbyopia, the medical name for longsightedness, have been linked with everything from high road deaths to low educational achievement and poor productivity in factories. Eye-health campaigners call it the largest untreated disability in the world.

It is also a staggering business opportunity. Essilor and Luxottica know this. It was Essilor that worked out and first publicised the 2.5 billion statistic, in 2012.

“For 2,000 years people were living mainly outside,” said Hubert Sagnières, Essilor’s chairman and chief executive, when we met recently in Paris. “Suddenly, we live inside, and we use this.”

He tapped his mobile phone on the table. The legal and technical details of the EssilorLuxottica merger will take a few years to iron out, but Sagnières was transparent about its mission: to equip the planet with eyewear over the coming decades.

“I am driving a very profitable company,” Sagnières told me. “You know, between 2020 and 2050, governments will not solve all the problems of the world.”

The looming power of EssilorLuxottica is the subject of morbid obsession within the eyewear world. Everyone knows the new company is poised to have a profound impact on the way that we are going to see.

“Forgive me,” said one longtime entrepreneur in the sector. “But it is nothing short of control of the industry.”

One investor described the new corporation as a “category killer”. In many conversations, people described its arrival, which would have been genuinely unthinkable a generation ago, as both extraordinary and somehow inevitable at the same time. That struck me as the kind of contradiction you come across more often in a person than in a business. And it is true of EssilorLuxottica and, to some extent, the business of vision itself, because it is – to an amazing degree – the legacy of a single man.

Leonardo Del Vecchio is the patron, legend and haunting spirit of the global eyewear business. He is its *Citizen Kane* and its *Captain Ahab*. His father died before he was born; his mother was poor; and he was raised in an orphanage in wartime Milan, where he went out to work as a metal engraver at the age of 14. In 1961, Del Vecchio opened a workshop in the town of Agordo, in the Dolomite mountains. He was 25, and starting out on his own. The valley around Agordo was emptying out because of the closure of a mine, and the town was giving away land to companies that were willing to move there. Del Vecchio asked for 3,000 sq metres on the riverbank to build a factory to make

parts for spectacles. He had a young family, and in time, he built a house next door to the workshop so he could step from one to the other, starting his day at 3am.

Over the next half century, Del Vecchio grew his company, which was called *Luxottica*, into the world's greatest maker of glasses frames. In an industry that was traditionally fragmented and small-scale, the totality of Del Vecchio's ambition took his rivals by surprise. He sought to control every element in the business, from the metal alloys of the hinges to the stores where eyewear is sold.

"Never assume that you have arrived, or look at the world as your only point of reference," he liked to say.

In a series of audacious takeovers, Del Vecchio acquired brands such as *Ray-Ban* and *Oakley* and *Persol*, and signed contracts with fashion houses such as *Armani*, *Ralph Lauren* and *Chanel*. He built factories in China, acquired vision insurance schemes in the US and retail chains on four continents.

Since 1994, Del Vecchio has been Italy's highest individual taxpayer and the country's second-richest man. A few years ago, people thought his career had run its course. But in January 2017, at the age of 81, Del Vecchio announced the greatest deal of his life, in which he also secured the final missing part for his frames – the lenses – when *Luxottica* agreed to merge with *Essilor*.

"He wants to do this merger," a former colleague said, "thinking he will leave behind this great company that will last for 100 years."

When I arrived in Agordo one recent afternoon, it was thinking about starting to snow. The town rests among steep wooded hills and the bare grey sides of mountains. The blue buildings of the *Luxottica* factory, with Del Vecchio's house still standing by the entrance, glowed across the river. Although the plant is now merely one of the company's 12 frame manufacturing facilities, which stretch from São Paulo in Brazil to Dongguan in southern China, the founding in Agordo remains *Luxottica's* organising myth. Every year, Del Vecchio hosts a Christmas dinner for the plant's 4,500 workers (the town of Agordo has a population of 4,000), which is entertained by an Italian pop star of his choosing.

"People are screaming and crying when he comes in," said Giorgio Striano, Luxottica's chief operating officer.

In Agordo, Del Vecchio is referred to as simply, "Il Presidente".



Leonardo Del Vecchio (right) with Giorgio Armani in Milan, 2013. Photograph: Stefania D'Alessandro/Getty Images

For the company's 30th anniversary, in 1991, Del Vecchio renovated some 15th-century stables in the middle of Agordo and opened a private glasses museum. The curator, Caterina Francavilla, who is the daughter of Del Vecchio's longtime deputy, showed me round before she closed up for the day.

The first glasses were almost certainly made in northern Italy in the last decades of the 13th century. (Lenses are called lenses because they looked like lentils.) But for centuries after their invention, spectacles and other magnifying lenses were mostly rejected by medical men, who warned of their unnaturalness and recommended potions to correct people's eyesight instead. In *The Perfect Oculist*, of 1666, Robert Turner, a London doctor, recommended turtle's blood and the powdered head of a

bat for the treatment of squints. For weak eyesight, you might try wearing cow's eyes around your neck.

The cabinets in Del Vecchio's museum traced the evolution from the leather frames and hinged bridges of the middle ages to the gold rims of the 19th century. There were opera glasses designed by Napoleon for his Polish mistress, Maria Walewska; a pair of Emperor Franz Joseph's spectacles; and some pink "*occhiali appartenenti a Elton John.*" No one knows why it took 400 years to put the arms on glasses – which are known as temples, and were pioneered in London in the early 18th century – so they finally sat comfortably on people's ears. To mark another historic milestone, one cabinet also held a copy of *Luxottica's* slender debut catalogue, from 1971, when the company made its first complete frames.

On a shelf near the door of the museum, I spotted *A Man Who Sees Far*, an official *Luxottica* biography of Del Vecchio, which was published in 1991. I expected the optical world to be genteel and polite, and was taken aback whenever conversations turned to the personal charisma, and menace, of Del Vecchio.

"He's the godfather," said Dean Butler, who founded LensCrafters in 1983.

(Del Vecchio bought it in 1995.)

"The godfather, to me, is the guy. He runs it."

One former senior Luxottica executive told me:

"Honestly, he kind of rules by fear."

Very few opticians would even mention Del Vecchio's name – lending him a Voldemort-like aura – for fear of offending him, however unlikely that might be. One talked about

"getting a horse's head in the bed".

Another concluded our interview by saying:

"You can quote me as long as it sounds like I am sucking Del Vecchio's dick."

I took *A Man Who Sees Far* back to my hotel. Even in the company's hagiography, Del Vecchio comes across as improbably driven and unfeeling. The biographer struggles to get a few words with *Il Presidente* as he crosses the tarmac to his private jet. (Del Vecchio rarely gives interviews; he declined to speak to me.)

*"There were no kisses, no cuddles," his eldest daughter, Marisa, recalls in the book.
"Frankly, we were scared of him."*

Del Vecchio built the empire of *Luxottica* on two ideas. The first was to do everything itself. After the company's initial progression from parts to frames in the early 1970s, it set out, step by step, to control the entire process of making and selling glasses, from acquiring the raw materials to selling its own products in its own stores. No one had done this before Del Vecchio.

“There is a simplicity to him,” one former colleague told me. “To him it is a very simple equation: I make the best stuff, why doesn’t everybody buy it?”

For the first 25 years, *Luxottica* stayed on the wholesale side of the industry – “behind the curtain”, as it is known – selling its glasses through opticians to the public. In the 1990s, however, Del Vecchio decided he wanted a retail network too. First, he got *Luxottica* listed on the New York stock exchange, an almost-unheard of move for a mid-sized Italian business.

“A lot of big experts said it was impossible,” said Roberto Chemello, the chief executive at the time.

Luxottica later estimated the listing to have been worth around \$100m in advertising in the US – and it laid the ground for Del Vecchio’s hostile takeover of *US Shoe*, a conglomerate that owned *LensCrafters*, the country’s largest optical chain, in 1995. On paper, the deal appeared outlandish. *US Shoe* was five times larger than *Luxottica*, and its board did not want to sell. Having its own shops would also put *Luxottica* in direct competition with the thousands of optometrists it had been supplying for decades.

“You have to be not only courageous,” said Chemello, of the transaction, “but a little bit crazy.”

Luxottica bought *US Shoe* for \$1.4bn.

Once the deal was done, Del Vecchio promptly broke up *US Shoe*, whose roots went back to 1879, until all that was left were the *LensCrafters* stores that he wanted in the first place, which he proceeded to fill with *Luxottica* frames.

*“That is exactly the formula they have used ever since,” said Jeff Cole, the former chief executive of Cole National Corporation, an even larger optical retailer that sold out to *Luxottica* in 2004. “When they buy a company, they spend a little time figuring it out and kick out all the other suppliers.”*

The formula means that when you or I walk into a *LensCrafters*, or a *Sunglass Hut*, or a *David Clulow*, or an *Óticas Carol* (which has 950 branches in Brazil) or a *Xueliang Glasses* in Shanghai, or a *Ming Long* store in Hong Kong, around 80% of the frames on display will be made by *Luxottica*. Having its own designers, engineers, factories, supply depots and retail outlets – *Luxottica* currently has almost 9,000 stores and contracts with a further 100,000 opticians around the world – means it can bring products to market faster and in greater quantities than any of its rivals. It also keeps a larger proportion of its profits as a result.

In the factory in Agordo, I saw dual-armed robots pinning together the front and temples of *Ray-Ban Wayfarers*, and basket after basket of metal frames being dunked in a series of chemical baths to coat and colour them. Glasses may appear to be relatively simple objects, but they involve between 180 and 230 manufacturing stages to produce. With its own designers, lasers and massive, quietly humming machines, *Luxottica* can take a pencil sketch to global production in about three weeks.

“We are in a closed loop,” said Striano, the operations chief.

Taking into account all the different colours and face shapes (Japanese noses are not the same as Latino noses), *Luxottica* has around 27,000 models in production at any one time. Its plants turn out 400,000 pairs of frames per day. I asked Striano if any other company came close.

"I think nobody," he said.

Del Vecchio's second great insight is the one that changed the nature of the optical business – and that was to combine it with the fashion industry. Although designers such as *Pierre Cardin* and *Christian Dior* had been experimenting with frames since the 1960s, Del Vecchio saw a way to take their ideas, and more importantly, their labels, to a mass market. In 1988, he signed a licensing deal with *Giorgio Armani*, another self-made tycoon, who had started out as a window-dresser at a department store in Milan. The deal transformed the glasses game. Until then, consumers in Europe and America who wanted fancy spectacles had to rely on staid, industry names such as *Zeiss*, *Rodenstock* or *Silhouette*. After the *Armani* deal, they could buy *Prada*, *Gucci* and *Chanel*, and they were willing to pay for it.

"It created something," as one Luxottica manager artfully told me, "to make the needs where probably they are not."



A store selling *Luxottica* brands *Oakley* and *Ray-Ban* in New York. Photograph: Alamy Stock Photo

By the early 1990s, *Luxottica* salesmen supplying opticians in the City of London were making so much money that they were using chauffeurs to get around. (*Armani* himself has sat on the board of *Luxottica*, and owns a 5% stake in it.)

In early 2018, *Luxottica* has around 30 brands, including some that it owns outright, such as *Ray-Ban* and *Persol*, or that it produces under licence (*Michael Kors*, *Paul Smith*, *DKNY*, *Burberry* and so on).

People in the industry observe that taste in frames follows a roughly 30-year cycle, from metal, to rimless, to acetate and back again, in which familiar spectacle shapes recur and then disappear. The trend right now is towards metal, and designs that last flowered in Ronald Reagan's America. In the "Style Area" in Agordo, on the factory's first floor, I met Mario Mollo, a senior product manager.

"You see now the 80s is becoming very popular," he said. "You see shallow, very wide."

Mollo was poring over a desk of large-scale drawings of a new acetate frame for *Oliver Peoples*, named "*Leonardo*". Spectacle frames require a thousand barely noticeable design decisions, around the shape of the bridge, the thickness below the eyes, or the pantoscopic tilt (how the angle of the lens meets the front of your cornea). The *Leonardo* had an unusual temple, in which a curving piece of wire had to be sandwiched between two pieces of acetate.

"Sometimes this one is not easy to find the right bending," said Mollo, tracing his finger along the drawing.

Like every other senior *Luxottica* figure I met in Agordo, Mollo was Italian, male, dressed in cashmere, and wearing a pair of the company's frames. On a workbench a few feet away, there was a pair of

€4,000 (£3,500) Dolce & Gabbana sunglasses that were hand-painted in Sicily, made out of wood and looked like a carnival float.

“With sun, you can go totally crazy,” said Mollo.

Luxottica had made only 100 for the entire world.

“Crazy,” said Mollo, “but sold out.”

The transformation of glasses from a medical device to a means of self-expression, like clothes or sneakers, has been a source of joy for millions of people. But it has also obscured their original purpose, and complicated efforts to distribute them as easily as, say, mosquito nets or aspirin. When I mentioned this to Mollo, he recalled a recent trip he had taken with *Luxottica*’s corporate social responsibility programme, conducting eye tests and distributing glasses in rural China.

“They were so happy having the possibility to see. They were hugging us. It was really not for fashion,” he said. “Then they started, you know, looking at themselves,” – Mollo paused for a second – “and the fashion moment arrived.”

The fusion of the fashion industry and the optical business is now regarded as complete. Until recently, eye-health charities and campaigners used to distribute thousands of pairs of secondhand glasses from richer countries to poorer populations that lacked them. In 2011, the *World Health Organization* advised them to stop – in part because people were refusing to wear outdated styles.

“Being poor doesn’t mean we want to look stupid, you know,” Prof Kevin Naidoo, who runs the Brien Holden Institute, one of the world’s leading eye-health NGOs, told me.

My last stop in Agordo was *Luxottica*’s sample room, a broad, quiet, carpeted space looking out over the river. The room contains every current *Luxottica* design, arranged on various tables and ranked in order of sales. The system has been in place since the plant was built in 1972, and during that time, it has been the domain of Luigi Francavilla, *Luxottica*’s deputy chairman, who is now in his early 80s.

“Glasses are beautiful,” he said, pausing among the hierarchies of Ralph Lauren, Valentino and Bulgari models. “Especially the ones that sell the most.”

It was snowing outside and Francavilla was wearing a thick blue cardigan. One of the first things he did was to take my glasses off my face to identify the tortoiseshell acetate, which is known as *Havana*. His own glasses were a pair of rimless *Ray-Bans* with pink carbon-fibre temples. *Luxottica* bought *Ray-Ban* from *Bausch & Lomb*, one of the 20th century’s great optical companies, in 1999. At the time, the label was washed up. You could buy a pair of *Aviators* at a petrol station for \$19 (£14).

“It was a train smash,” a former senior Luxottica executive told me. “They were selling Wayfarers at Walmart.”

Del Vecchio paid \$645m (£476m) for *Ray-Ban*. During the negotiations, he promised to protect thousands of jobs at four factories in the US and Ireland. Three months later, he closed the plants and shifted production to China and Italy. Over the next year and a half, *Luxottica* withdrew *Ray-Ban*

from 13,000 retail outlets, hiked their prices and radically improved the quality: increasing the layers of lacquer on a pair of *Wayfarers* from two to 31. In 2004, to the disbelief of many of his subordinates, del Vecchio decided that *Ray-Ban*, which had been invented for American pilots in the 1930s, should branch out from sunglasses into optical lenses, too.

"A lot of us were sceptical. Really? Ray. Ban. Banning rays from the sun?" the former manager said. "But he was right."

Ray-Ban is now the most valuable optical brand in the world. It generates more than \$2bn (£1.5bn) in sales for *Luxottica* each year, and is thought to account for as much as 40% of its profits. Francavilla joined the company in 1968. I asked him how a man with a small spectacles workshop in the Dolomites had come to bestride the global eyewear industry.

"L'appetito cresce con il mangiare," said Francavilla.

The appetite grows with eating.

How did just two companies – one in frames, and one in lenses – come to dominate something as generic, as obvious, as glasses? It's almost as if the world had one manufacturer for pens, and another for ink. The conditions that have allowed for the rise of *Essilor* and *Luxottica* are rooted, deep down, in the way spectacles are sold. Until the end of the 19th century, you could buy a cheap pair of glasses – for reading or for distance – out of a rack in *Woolworth's*, or from a jewellery shop, or a guy in the street. Eyewear was a craft of tinkerers and inventors.

"I this evening did buy me a pair of green spectacles," Samuel Pepys wrote in his diary on Christmas Eve 1666, "to see whether they will help my eyes or no." (They didn't; Pepys' failing eyesight forced him to give up his journal three years later.)

It was the birth of the optometry profession, around 1900, that changed things. This was a new breed of sober, respectable spectacle-sellers – not unlike pharmacists – who wanted to standardise eye tests and to restrict the sale of glasses to licensed professionals. Their aim, for the most part, was to raise standards. Eyeglass pedlars in the 18th and 19th centuries were notorious for scams and faulty lenses. But there was also another compelling reason to take a cheap, widely available product and put it in the hands of a few authorised sellers – and that was to make money.

The first opticians had a tough time of it. They were disdained by ophthalmologists – proper eye doctors, who had trained in hospitals and considered themselves above the tawdry trade in glasses.

The first optometry course in the US was taught at Columbia University's physics department because it was not allowed inside the medical school. (A remnant of this prejudice still holds: within the optical industry, optometrists are always being teased for their chippiness and self-importance. "One step above dermatology," a former *Luxottica* executive sniped to me).

But the new professionals persevered and, in a way, the story of optometry for much of the 20th century was of finding new ways to protect their patch. Across Europe and in the US, optometry laws and regulations were passed to control the prescription and selling of eyewear. Many of these had a "doctorly" aspect, but they also had the effect of creating a highly opaque marketplace. For a long time, opticians fought all forms of advertising, for example, which might force them to spell out their prices and allow customers to shop around. In some places, this reached ridiculous extremes: in Kentucky, for a time, optometrists' signs could not be more than four inches high.

Under Britain's *Opticians Act* of 1958, the display of prices was banned altogether, which meant that opticians were more or less free to make them up on the spot.

"The price would come from a little black book," one veteran practitioner told me. "There was a lot of sharp practice around."

Limiting the number of glasses sellers gave the largest optical manufacturers opportunities to try and corner the market. As early as 1923, the US government was investigating a scam to fix prices of the nation's best-selling *Kryptok* bifocal lenses. After the second world war, investigators at the US Department of Justice uncovered a vast kickback scheme – thought to amount to \$35m a year, and to involve some 3,000 eye doctors – in which the *American Optical Company* and *Bausch & Lomb* effectively bribed practitioners to prescribe their lenses. In 1966, after another scandal, the two companies, which at one time manufactured around 60% of the glasses sold in the US, were banned from opening new retail and wholesale outlets for 20 years.

This was when *Essilor* came on the scene. In 1972, *Essel* and *Silor*, two French optical companies, merged and began sell aggressively into the US market. *Essilor* specialised in plastic lenses, which were replacing glass, and it also had a magical product: "*Varilux*", the world's first progressive lens, invented by an *Essel* engineer named Bernard Maitenaz in 1959. Progressive lenses allow people who are both long- and shortsighted – typically older customers – to combine their prescriptions into a single, graduated lens. The early *Varilux* models were experimental and not everyone could adapt to them, but they were probably the most important innovation in eyewear since the invention of bifocals around the time of the French revolution. The company set out to make sure that *Varilux* and the rest of its products (*Essilor's* current sales manual runs to around 400 pages) were sold in every optometrist's in the world.



The *Essilor* department of the *Vision Institute* research centre at the *Quinze-Vingts National Ophthalmology Hospital*, Paris. Photograph: BSIP/ UIG via Getty Images

Lenses are the pixie dust of the optical business. Barely anyone knows what they are made of, how they are constructed and, especially at the high end, exactly how they work. For the last half century, persuading opticians to prescribe *Essilor*, as opposed to *Hoya* or *Zeiss*, the company's main rivals, has been painstaking,

face-to-face work. One British optician, who stocks *Essilor*, described it to me this way:

"Is there a difference between an Audi, a BMW or a Mercedes? Probably not. But you prefer that badge to that badge, or the way they win hearts and minds."

For years, the company has brought opticians to Paris and its *Essilor Academy*, where they are wined and dined and taught about its latest products.

"It's not really bribes; it's the way it works," one industry veteran told me.

And when all else fails, *Essilor* – like its rivals, and like all wholesalers – uses financial incentives to keep its customers satisfied. Opticians and industry analysts that I spoke to for this article described how *Essilor* uses so-called "*spiff money*" – offering stores large, multi-year discounts and cash bonuses for selling its products – in order to squeeze out the competition.

“Essilor wants to dominate this industry worldwide,” one retailer told me. “They are actually a well run company. They are not a ruthless company. But they get away with all this crap which in any other industry would be anti-consumer.”

The arrangement suits *Essilor* and its clients pretty well. The profit margins within the optical business are a closely guarded secret, but insiders explained to me that while opticians might sell frames for two, or two and a half times, their wholesale price, it is the lenses where they make the most money, charging markups of 700% or 800% to their customers. The largest margins of all are on complex progressive lenses and protective coatings – for scratch resistance, or to cut out blue light – features that cost *Essilor* a few cents to make, and which opticians sell for between £25 and £50 a pop. Even *Luxottica* executives are awed by this.

“Ray-Ban did a good job of saying Ray-Ban would cost \$150, £150, €150 and the equivalent across the world. A little bit like the Big Mac, right?” one former marketing manager told me. “But lenses? Nobody knows how much lenses cost. The consumers don’t know. Nobody knows.”

Some opticians call *Essilor* “The Big E”. The company boasts of supplying between 300,000 and 400,000 stores around the world – three or four times as many as *Luxottica*.

“The strategy has to be absolutely global,” Sagnières, the chief executive, told me. “Not just for the rich or poor.”

The company has not restricted itself to lenses by any means. If *Luxottica* has spent the last quarter of a century buying up the most conspicuous elements of the optical business (the frames, the brands and the high-street chains) then *Essilor* has busied itself in the invisible parts, acquiring lens manufacturers, instrument makers, prescription labs (where glasses are put together) and the science of sight itself.

The company holds more than 8,000 patents and funds university ophthalmology chairs around the world. In deals that rarely make the business pages, *Essilor* buys up Belgian optical laboratories, Chinese resin manufacturers, Israeli instrument makers and British e-commerce websites. You can find threads on optometrist message boards with headings like “*Essilor Has Purchased and Now Owns (Insert Company Name Here)*”, which attempt to record all the independent lens makers and laboratories that used to exist. Within the industry, the Big E is generally considered less rapacious than Del Vecchio’s *Luxottica*; people regard it instead as a kind of unstoppable, enveloping tide.

The first rumours, imaginings really, of the two companies joining forces began more than a decade ago. The idea has an intuitive appeal – the satisfying click of lenses with frames – but there were considerable obstacles. The first was cultural. *Essilor* might be huge, but it has retained the feel of a traditional, French industrial enterprise: 55% of its employees are shareholders of the company. *Luxottica*, on the other hand, functioned more or less like a monarchy, with none of the management structures of most multibillion-dollar companies.

“The corporate governance and headquarters of Luxottica were Mr Del Vecchio’s dining-room table,” one former manager in the US business recalled of the early 2000s. “We

would fly to Italy, go to his house, show him our annual plan ... He was like, 'Go do that again.'"

The companies saw themselves differently too.

"I think Essilor, while not a model company by any means, has a moral purpose," the former manager said. "With Luxottica, it's just lip service. It is all about domination."

The most infamous *Luxottica* deals carried an edge of brutality. In 2001, the company clashed with *Oakley*, the world's hottest make of sunglasses at the time. *Luxottica* had just bought *Sunglass Hut*, which sold a third of the US's sunglasses, and Del Vecchio demanded that all its suppliers drop their prices. *Oakley* refused. In the summer of 2001, the company's founder Jim Jannard flew to Milan to meet Del Vecchio and strike a deal. Jannard had founded *Oakley* out of the back of his car in 1975. According to *Forbes* magazine, at the end of their conversation, he said he hoped the two men would one day be friends.

"We will never be friends," Del Vecchio reportedly replied.

A few months later, *Il Presidente* swung into action. In November, *Sunglass Hut* stopped selling *Oakleys*. The chain made up around a quarter of *Oakley's* business and its share price fell by 37%. Then *Luxottica* began to produce *Ray-Bans* with bright blue and green lenses that were eerily similar to *Oakley's* trademark "Ice" and "Emerald" coloured shades.

"We were doing stuff like creating fake *Oakleys*," a former *Luxottica* executive who was involved in the strategy told me. "There was a kind of war going on."

After *Oakley* sued in 2001, *Luxottica* issued a statement "denying the allegations in *Oakley's* complaint in all material respects" and the case was settled out of court. But *Luxottica* won the war, buying Jannard's company for \$2.1bn (£1.5bn) in 2007.

By that time, Del Vecchio appeared ready to retire. In the summer of 2004, as he approached his 70th birthday, *Luxottica's* founder handed over day-to-day control of the company to Andrea Guerra, a young chief executive he hired from *Indesit*, the Italian white goods company. Under Guerra, *Luxottica* rationalised its manufacturing, shifting more production to China. It also became more stable and predictable. The share price trebled. But according to several former executives who were close to Guerra, he was opposed to any deal with *Essilor*, seeing the company as a long-term rival. (Guerra declined to speak with me).

"He did not want to merge with *Essilor*," a colleague said. "He wanted to protect us in a different way."

In 2014, however, Del Vecchio came back to work. He was 79.

"We were all pretty shocked," a former senior Italian executive told me.

But it became clear that Del Vecchio was worried about what would happen to *Luxottica* when he dies.

"His most precious child is this company," the US manager told me.

Del Vecchio has six children from four marriages to three women (he remarried his second wife, Nicoletta Zampillo, in 2010) but he has always insisted they will never succeed him. According to several senior figures at *Luxottica*, Del Vecchio came to believe that folding *Luxottica* into *Essilor* was the best way for his work to endure, and informal talks between the two companies began.

In many ways, the final chapter of Del Vecchio's rule at *Luxottica* has been chaotic and disorienting. Guerra was soon forced out. After that, Del Vecchio went through four chief executives in three years. In his early 80s, he is no longer the force that he once was. Subordinates told me that Del Vecchio can no longer work a full week and sometimes loses his place in meetings, while demanding to sign off on decisions as small as the floor-plans of new *Luxottica* stores. Dozens of senior managers have left.

"He really doesn't trust anyone," one told me.

But throughout his shaky return, Del Vecchio kept his eyes on the prize, meeting in secret with Sagnières, the CEO and chairman of *Essilor*, until, by the summer of 2016, Sagnières said,

"it was obvious" that the deal would go ahead.

When the two men announced the formation of the combined company on 16 January last year in a call to investors, Del Vecchio's voice came on the line.

"I'm very pleased to be here with you today," he said, "to present the achievement of a lifetime dream."

Over the coming decades, *EssilorLuxottica* will have the power to decide how billions of people will see, and what they can expect to pay for it. Public health systems are always likely to have more urgent problems than poor eyesight: until 2008, the *World Health Organization* did not measure rates of myopia and presbyopia at all. The combined company can choose to interpret its mission more or less however it wants. It could share new technologies, screen populations for eye problems and flood the world with good-quality, affordable eyewear; or it could use its commercial dominance to choke supply, jack up prices and make billions. It could go either way.

Right now it is *EssilorLuxottica's* putative rivals in developed markets, such as the US and Europe, that are most anxious about the power of the new company. In January, Doug Perkins, the other co-founder of *Specsavers*, warned that *EssilorLuxottica* was "throwing hundreds of millions of pounds" at new technologies, such as automated optometry kiosks and online retailing, that threaten the future of Britain's high-street opticians altogether.

"That is 100% certain to happen," said Perkins.

The bigger picture takes a moment to discern. Late last year, I visited Britain's most important optical collection, which is kept in the basement of the College of Optometrists, a townhouse around the corner from Charing Cross Station. For the last 19 years, Neil Handley, the college's historian, has been cataloguing 27,000 items donated by opticians and eyewear manufacturers, discovering the story of the industry as he goes along.

"It's under the radar," he said. "It's not something that is talked about."

When I asked Handley about the creation of *EssilorLuxottica*, he pointed to an old display of British spectacle parts, made by a firm called *Hadley* in Surrey in the 1930s. Until the 1970s, and the rise of cheap manufacturing in China, Britain used to have hundreds of frame-makers up and down the country. Today it has four.

“What you are seeing is a potential monopoly, and the risk that brings,” said Handley.

While it's easy to fixate on the brands and the profits of the giants of the optical sector, the industry as a whole must expand dramatically in order to serve the world's growing, ageing populations and increasing myopia among the young.

“The danger is if their proposed answer to these problems turns out not to be the answer,” said Handley. *“They have stifled all opposition, and so nobody else has the chance to come up with the right answer.”*

The stakes are highest in parts of the world that currently do not have anything like enough access to eyewear – what the industry calls the “white spaces” of Africa and parts of Latin America and Asia.

“It is always better if there is more diversity in the market, and less dominance,” said Prof Naidoo, of the Brien Holden Institute, about the impact of the merger. *“I don't think anyone can argue with that.”*

In 2013, Naidoo was one of the authors on a groundbreaking paper that forecast that half the world's population will be myopic by 2050 – almost 5 billion people. In the course of a single generation, across the world, from Inuit communities in Alaska to secondary-school students in Northern Ireland, researchers have recorded a rough doubling in the number of people who become short-sighted as children.



An Essilor laboratory in Ligny-en-Barrois, eastern France. Photograph: Jean-Christophe Verhaegen/AFP/Getty

The main reason, as far as anyone can agree, is a reduction in the time that they spend outdoors. Sunlight helps to moderate levels of dopamine, which in turn influence the development of the eye. Too much dopamine means eyeballs grow too long, and become oblong in shape, focusing light in front of the retina, rather than on it.

Vision campaigners forecast that the myopia epidemic will put enormous strain on health systems across the developing world, which are already unable to equip their populations with a medical device that has been around since the Middle Ages.

“We are barely managing in healthcare systems to provide eyecare,” said Naidoo. He corrected himself. *“Not barely. We are not managing. Can you imagine, when those numbers are doubling and tripling, what is going to happen?”*

Naidoo was reluctant to criticise *EssilorLuxottica*, however. In part that is because *Essilor* is the world's leading commercial funder of research into eye health, and a prominent force in improving access to corrective lenses. (Naidoo sits on the board of the company's *Vision Impact Institute* in Paris.) *Essilor's*

€200m R&D budget is three times the size of the rest of the industry combined, and it has a division called *2.5 New Vision Generation*, named for the 2.5 billion people who currently need glasses but don't have them. The company is investing in schemes such as mobile optometry, putting eye-health workers on motorbikes in Indonesia; at network of around 4,000 village-level optical stores in India; door-to-door salespeople in the favelas in Brazil; and working with the Liberian health system to get its products to what it calls the "base of the pyramid". Last month, *Essilor* pledged to provide 200m pairs of free ophthalmic lenses to the estimated 900 million people living in the Commonwealth without access to glasses.

In some of the least-served markets in the world, *Essilor* is more or less the only game in town. In 2016, the company opened an office in the Democratic Republic of Congo, a country of 78 million people and 200 optical stores. Last year, *Essilor* acquired a prescription laboratory in Ethiopia, which currently has roughly one ophthalmologist for every million people. (In European countries, the ratio is about a hundred times smaller.) In places like these, all that eye-health campaigners can do is watch, and hope.

"If the merged organisation decreases that investment, that will be a tragedy," said Naidoo. "And that risk is there, you know. We can just hope that the merged organisation will see there is an opportunity to grow more, rather than less."

No one at *Luxottica* was willing to speak in detail about its plans for the merged company. It was a different story when I visited *Essilor's* global headquarters, which is on a quiet street of apartment blocks in Charenton-le-Pont, in south-east Paris. The company's senior executives are, as a rule, noticeably more nerdy and less well-dressed than their Italian counterparts, but they are much more comfortable in their role as titans of the global optical industry. Sagnières, the company's 62-year-old chief executive and chairman, had the guileless glee of a high-school geography teacher whose class had just aced their exams.

"I won!" he said, describing the deal with Luxottica. "Anything can happen. I won already. You won. Your kids won! Seriously, this is how it is."

Sagnières told me that the company has calculated – on the basis that a simple pair of glasses costs €5 – that the world can be supplied with eyewear for around €500m a year for the next 30 years. Just as importantly, any investment that *EssilorLuxottica* ploughs into the bottom end of the market is likely to pay off in the end.

"We know that in three or five or 10 years, one day their life will have changed that much that they will afford to pay \$50 for a better lens or \$50 for branded frames," said Sagnières. "I am fine with that."

A few days later, I visited one of *Essilor's* research facilities in a former lens factory in Créteil, on the southern edge of the city. In a room full of brightly coloured furniture and signs that said things like "How can boomers enjoy their vision in all light conditions?" I met Dr Norbert Gorny, the company's head of R&D. Gorny is a tall, direct, German veteran of the optical scene, who explained that *Essilor* has spent much of the last decade expanding what it calls "the acuity corridor" on its progressive lenses, to help people read digital devices as they move around, compared to the more static way we used to read books and newspapers.

But the company is increasingly keen to reach what it calls its “Next Generation Consumers” – people in the developing world who don’t wear glasses yet. Gorny called them “The Uncorrected”.

“We do things for the 2.5 billion uncorrected,” he said. “But we also do things for people’s needs that are not already expressed.”

During the afternoon, he showed me rooms where researchers put on motion sensors, as if they are in a Hollywood studio, to measure the depth of vision required for everyday tasks. Gorny also talked teasingly about new lenses that the company is developing with unnamed tech companies to supersede Google’s failed “Google glass” project of a decade ago. This time around, the idea is to project information from the internet – maps, messages, and Twitter, I suppose – directly on to the back of people’s eyes.

“You can read easily – always sharp – information about where to go, the email that you did not want to miss,” said Gorny. “I leave it to your fantasy.”

In *How We Got to Now*, Steven Johnson’s book about innovation, he describes the crude reading lenses of medieval Europe as the first piece of technology “since the invention of clothing in Neolithic times, that ordinary people would regularly wear on their bodies.” It was possible, listening to Gorny and thinking of the teenagers of Seoul, urbanising populations in Africa, and people walking through European cities with their eyes fixed to their phones, to imagine a point where more or less the whole of humanity is watching the world through intermediating screens on their eyes. I asked Gorny whether he thought the 21st century, with its demographic changes, myopia epidemic and urge for digital information, would bring about a second optical revolution, in the manner of Germany’s printing presses in the 15th century. Will *EssilorLuxottica* become the Facebook of seeing?

“I don’t know whether we are starting a revolution, witnessing a major change like we witnessed 500 years ago,” Gorny said. “What I believe is we are in the right industry at the right time.”

The question is whether there is anyone, beyond its shareholders, that will be able to hold *EssilorLuxottica* to account. I’m not sure there is. The next few years might be rocky, as the new company grapples with its size and attempts to find a new leader who can define the corporation and its ultimate goals under the fading shadow of Del Vecchio. But after that, the field is open and the fundamentals are clear.

On my way back to London, Gorny gave me a lift to the station.

“There is nothing close to that firepower once the combination is done,” he said. “You have the global footprint. You can play all the courts.”

And I thought about how one of the telling aspects of wearing glasses is that they help you notice everything else – and for the most part, see the world as it actually is – but it is only occasionally, through a chance reflection, or when you really take a moment to stop and look, that you see what is sitting on the top of your nose.