Novasecta

THE NOVASECTA GLOBAL 100

How pharma companies are shaping the future of healthcare

2019

Contents

About Novasecta:

Novasecta is a specialist strategy consulting firm for pharmaceutical and biotech companies.

We provide practical solutions based on a profound understanding of the unique businesses and industry context of our clients. We deliver the strategic counsel, insight, and change that they need to drive performance improvement and sustainable growth.

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The Novasecta Global 100 explores how the world's top 100 pharmaceutical companies are shaping the future of healthcare. Most of these are pure pharma-only companies, some are more diverse businesses, for example comprising pharma and diagnostics, devices, consumer health, animal health or other related healthcare interests.

We rank the companies by total group revenue to reflect the success and financial firepower of the companies that have pharmaceuticals as part of their portfolios.

We examine their capital allocation choices, their models for innovation and commercialisation, and the critical success factors that have established these companies in the Global 100. We conclude by highlighting how their diverse and collaborative nature is a force for good in global healthcare.

Novasecta analysed public domain data for the top global companies that have recognisable pharmaceutical interests as part of their business portfolios. We consider companies that have both on-market pharmaceutical products and clear evidence of R&D investment, and exclude distributors and service companies. We use data for the years 2012-2018 (calendar years or nearest published business year) sourced from the GlobalData database and supplemented by secondary public domain research for some private companies. In each graphic and the ranking table we show data for the 2018 year or the 2017 year where 2018 data is not available. If a trend is shown, we show the five-year 2013-2018 compound average growth rate (CAGR), or 2012-2017 if the 2018 data is not available. All reported data in local currencies has been converted to US dollars ($) at the calendar average exchange rate for the year that is analysed. We analysed data including the country in which the company's headquarters is located, group revenue, number of employees, R&D spend, SG&A spend, profits (using operating income as a proxy for earnings before interest and tax, EBIT), number of mergers and acquisitions (M&A) and strategic collaboration deals, number of unique clinical assets in pipeline at 8th February 2019, market capitalisation at 21st March 2019 (for public companies). For the definitions of deals M&A includes acquisitions and asset transactions; strategic collaborations includes licencing agreements and partnerships. We show the median performance by regional headquarters of the company for relevant measures, where the regions are Europe, The United States of America (United States), Japan, China and India and Rest of World (RoW). For Europe we include EU countries and Switzerland. In each graphic, we show measures and data for each of the top 100 companies unless the data is not disclosed, in which case we show data for the sample of companies for which data is available.

Introduction:
What distinguishes the Global 100

Our Global 100 report tells the story of a pharmaceutical industry that is rich in heritage, innovation and value. The top 100 companies are highly global, highly diverse and highly successful. Each generated more than a billion dollars in revenue. Despite living in a world of increasing nationalism, they're highly collaborative too: global partnerships are both a common feature and a prudent path to risk mitigation and long-term growth among the leading companies. The enduring profitability of many organisations within the ranking is impressive.

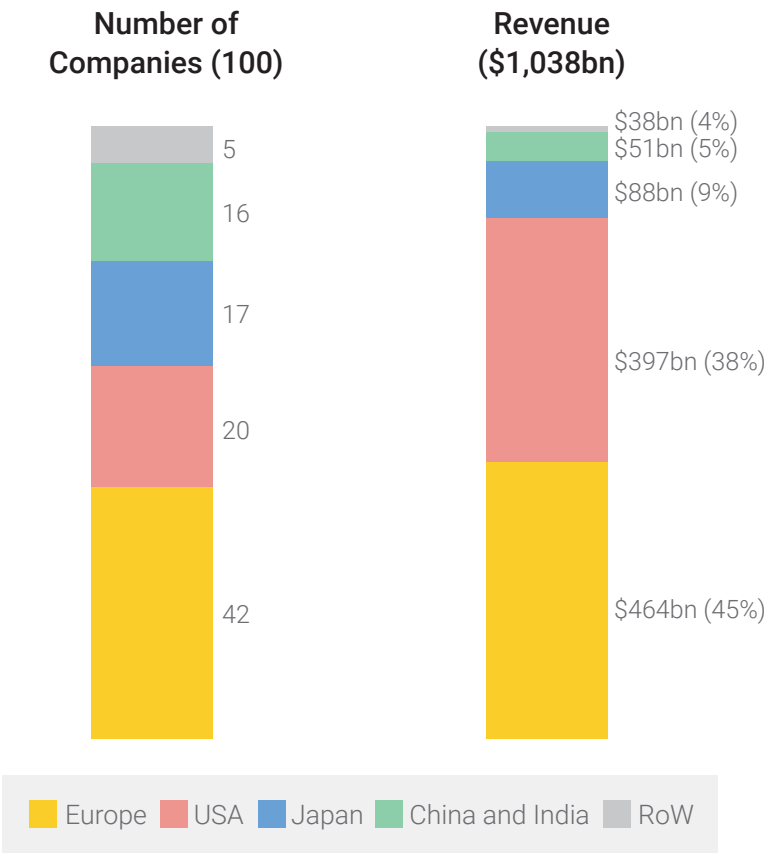
However, technological advances in the therapeutic environment – and the endemic challenge of patent expiry – present limits to growth at the top of the industry. These companies cannot afford to stand still, yet at the top some are not managing to grow in terms of revenue; as our analysis later shows, while making it into the top 100 is an achievement, sustaining growth is much harder.

Our Global 100 ranking is based on the total group revenues (2018) of each company. Companies for which pharmaceuticals sits within a broader healthcare portfolio – such as Johnson & Johnson (consumer care and devices), Fresenius (medical care), Bayer (food and crops) and Abbott (devices and nutrition) – bring a different mind-set than the pure pharma-only companies, for example using revenues from other divisions to both diversify risk and invest in pharmaceuticals. In a market environment that increasingly requires a more customer-oriented mindset and solutions that go 'beyond the pill', these companies are choosing to make a contribution to global healthcare beyond the boundaries of what has been known as conventional pharmaceuticals business.

A regionally diverse group of companies

The world of large pharma companies is commonly perceived to be dominated by US-headquartered companies, but collectively this isn't the case:

European companies represent the largest segment of the Global 100 by both volume and revenue

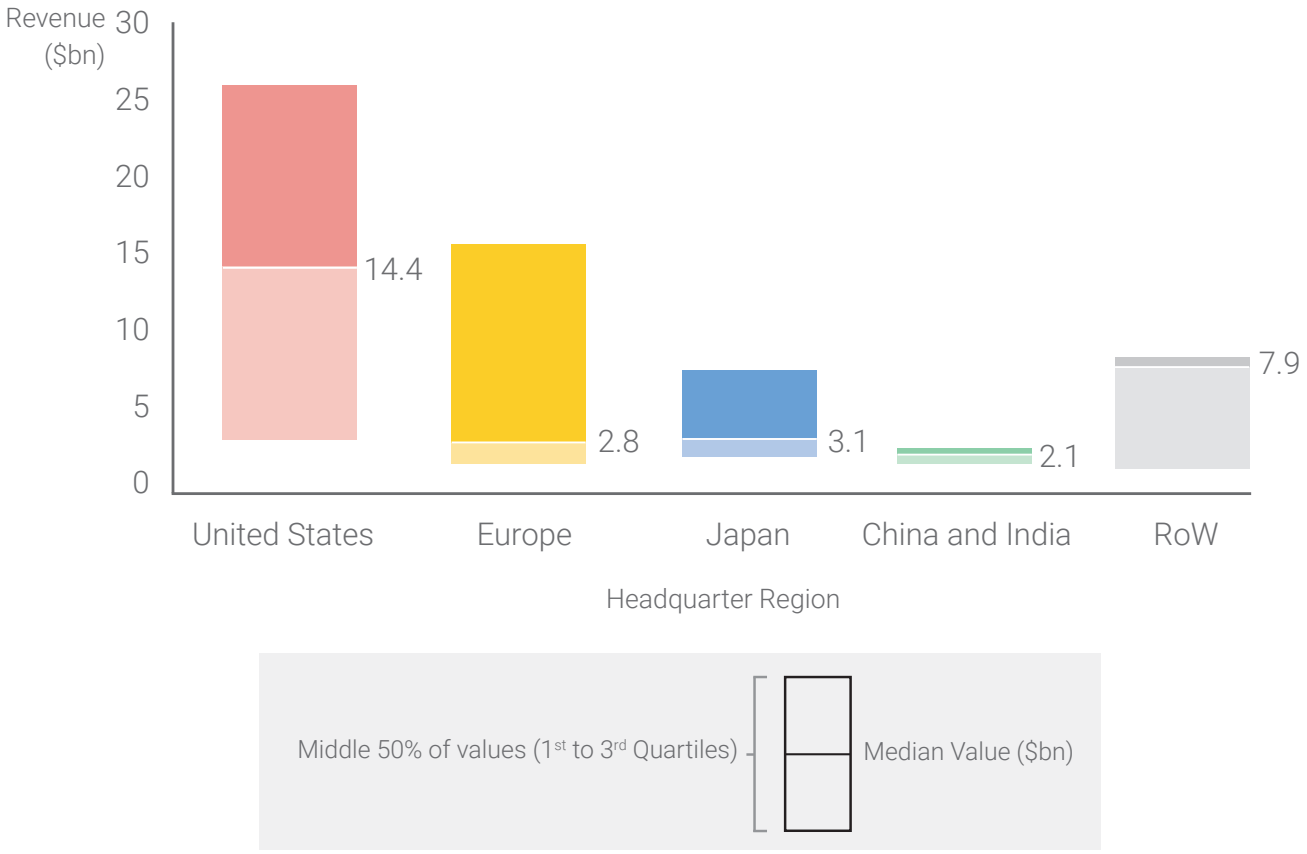


Whilst the US is the world's dominant market in terms of demand for pharma products, accounting for nearly half of the world pharmaceuticals sales market, European headquartered companies represent the largest segment of the Global 100 by both volume and revenue. Europe hosts more than double the number of companies than the US in the top 100, and accounts for 45% ($464bn) of the Global 100's total aggregated revenues, ahead of the US with 38% ($397bn).

The global diversity of the industry is further highlighted by the more recent emergence of Chinese and Indian companies, with 16% of the top 100 headquartered in these two countries. Our analysis later in this report will show how local culture is influencing the business models of companies, not only in China and India, but right across the industry. Fundamentally, our analysis of the Global 100 underlines that to be a leading company, you must be globally-minded and be prepared to compete with players outside of your home market.

However, despite being outnumbered by European companies, US pharmas are typically much larger individually than their global peers:

The US Global 100 companies are typically much larger than their global peers



The median revenue for US firms is an impressive $14.4bn, compared to $3.1bn in Japan and $2.8bn in Europe (Figure 2). US performance is led by Johnson & Johnson (J&J), which with 2018 revenues of $81.6bn, is comfortably our number one ranked company in the Global 100 – more than $20bn ahead of Roche in second place.

The commercial success of US companies is largely due to three factors: (a) abundant capital availability, (b) proximity and connection to high prices and volumes in the domestic market, and (c) the long-term benefits of exploiting the revolution in biotechnology as biologics continue to replace the prior dominance of small molecules in therapeutic solutions. Amgen, AbbVie, Biogen, Genentech (now part of Roche), Genzyme (now part of Sanofi), and Regeneron all emerged from the first wave of biotechnology entrepreneurship in the US that spawned considerable growth for these pioneers. Globally-minded European and Asian players have similarly benefited from US capital markets, the attractive US market and biologics technology emerging from the US.

Growth typically starts from a great product or a great technology

Our snapshot of the Global 100 reflects the long and diverse history of the pharmaceutical industry. The list comprises both well-established pharma companies with rich heritage and younger former 'biotechs' driven by technological advancement. Examining the roots of a pharmaceutical company often illustrates an important strategic anchor that dictates its long-term evolution. And historically, successful pharma companies have started from one of two models: a great product or a great technology.

The most common route to becoming a leading pharma company has been an entrepreneurial pharmacy-based company that built its success off the back of an initial great product that provides a genuine benefit to patients. Such companies have benefited from the industry's combination of having patent protection and very high product margins. Other companies – like the US recombinant biologics companies – started with strong technology platforms and grew from there. Once established, sustaining success is much harder. Creating a second great product to replace the first is tough, and once technologies are established, competition is fierce.

Sustaining beyond a great product or technology is the essence of the challenge for the Global 100. Some inspiration can be drawn from the oldest pharma company in the world, Merck & Co., which was formed out of the original Merck in Darmstadt, and has followed a purpose-led approach as outlined by George Merck in 1950: "*We try never to forget that medicine is for the people. It is not for the profits. The profits follow, and if we have remembered that, they have never failed to appear. The better we have remembered it, the larger they have been.*"

Similarly, J&J repeats its long-established credo that declares its *"first responsibility is to the doctors, nurses and patients, to mothers and fathers and all others who use our products."* J&J's position as the top company in the Global 100 indicates that its purpose-led approach has been highly effective for it. The long-standing purposes of both J&J and Merck define a more customer-centric essence for pharma than those still driven by products or technologies, or indeed financial returns alone. Many of the Global 100 could valuably apply such a customer-oriented approach, as indeed many of their 'patient-centric' vision and mission statements now assert.

1. Capital Allocation

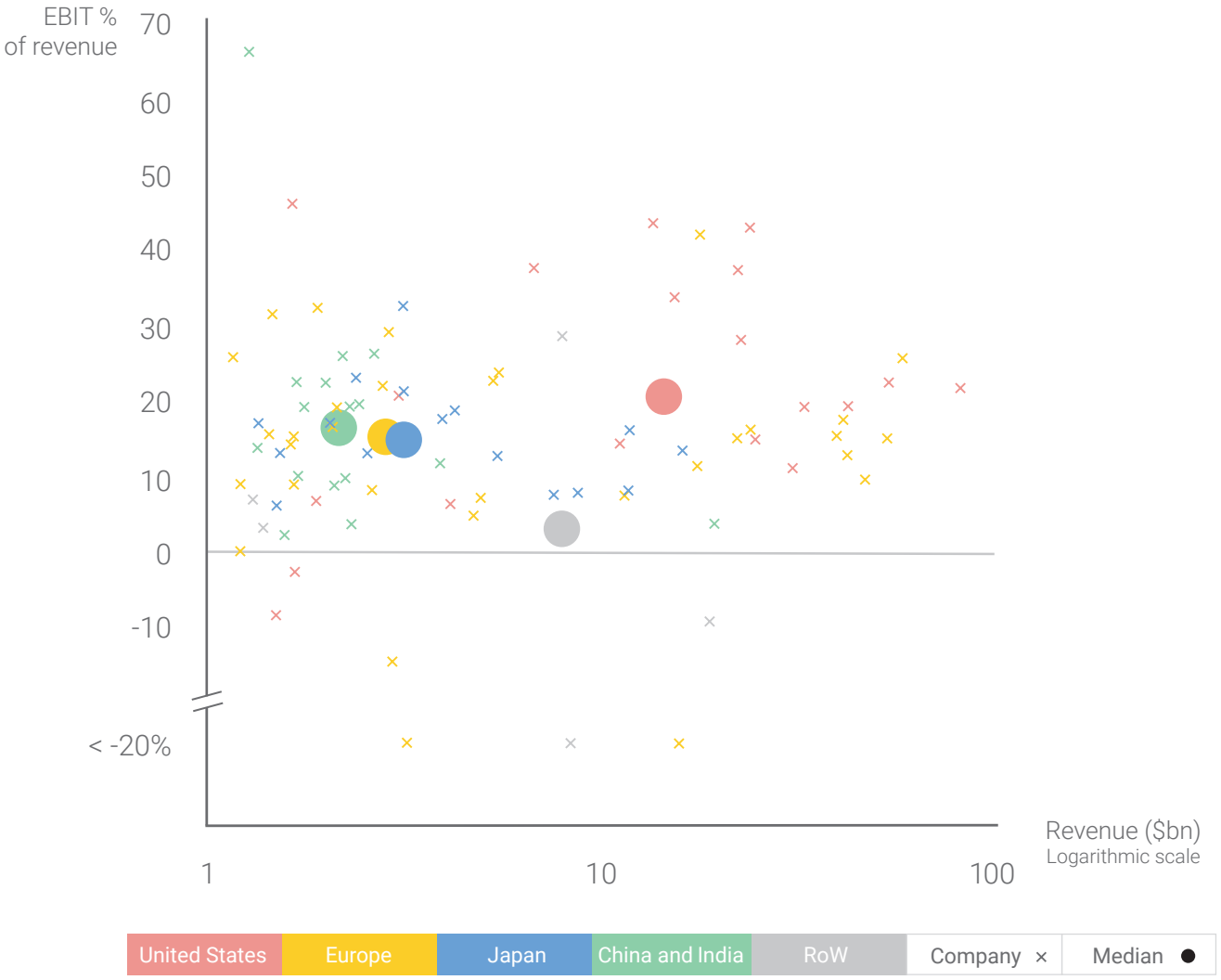
Capital allocation is driven by the choice of business model: in which of the highly diverse domains of healthcare should a company put its capital to work? At the macro level, this can boil down into a choice between value or volume: high-end innovation in niche populations or incremental innovation to drive global access. However, the sub-dimensions beneath this also reveal a tremendous diversity of potential models: primary care, specialty care or rare diseases; OTC, generics or branded generics; regional diversity or single-country focused; diversified technologies or single platform technology-led. The choices are vast.

Irrespective of the business models they have chosen, each of the Global 100 has, by definition, been successful. However, drill deeper and it is clear that endemic complexities in the industry's model present major challenges at the company level when choosing where to deploy capital.

Profitability across the board provides options for effective capital allocation

Pharmaceuticals has always been a profitable endeavour, albeit with risk, and the 2018 picture of the Global 100's Earnings Before Interest and Tax (EBIT) margins across all sizes and geographical locations illustrates this well:

Pharma is still highly profitable for companies of all sizes



The majority of companies have EBIT margins of 15% and above, with many exceeding 30%. This provides an opportunity to invest for further growth that many other less profitable sectors would envy.

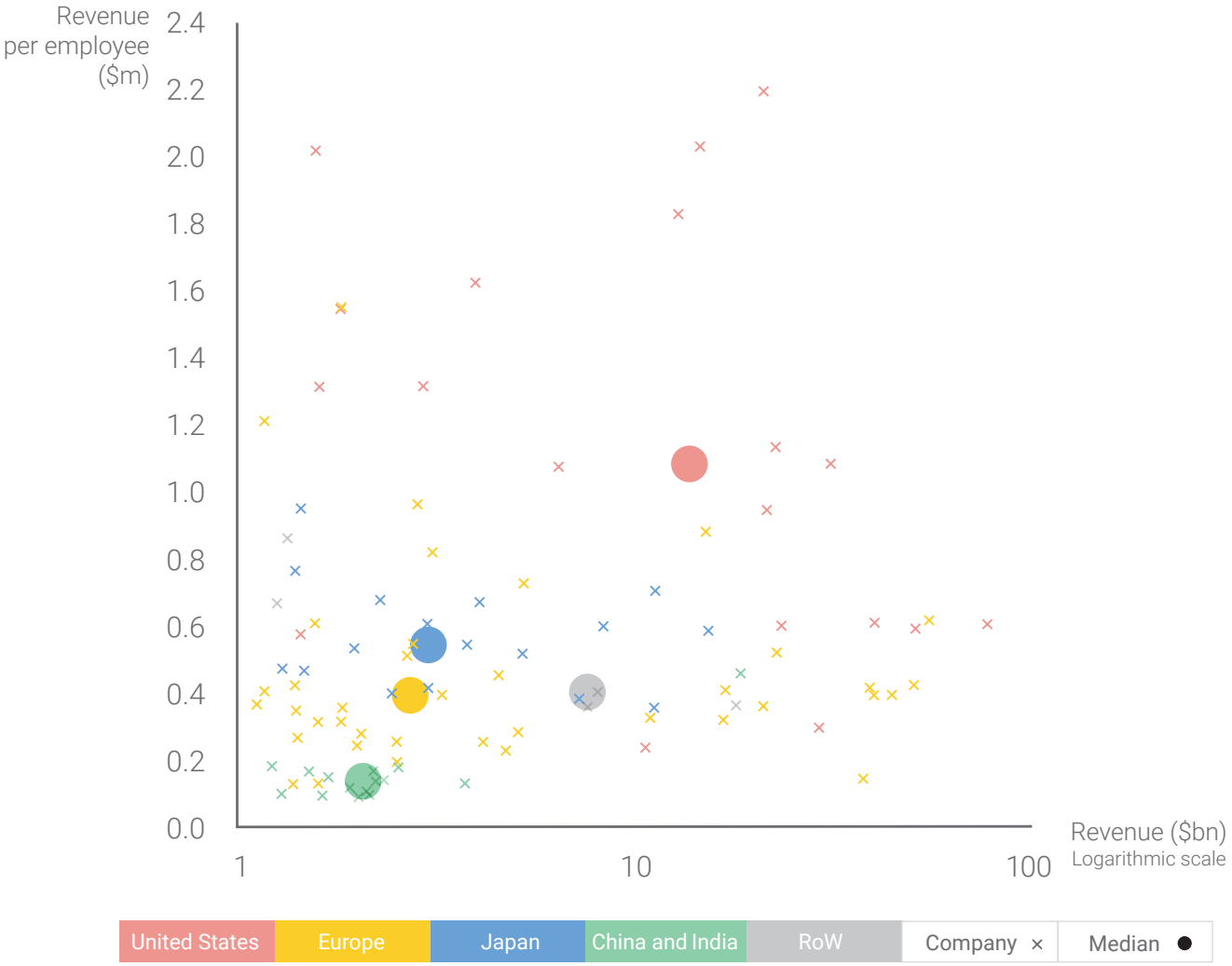
There are therefore many capital allocation options facing the Global 100; the pursuit of high-value medicines requires considerable capital with high risks associated with high potential returns. Of late this phenomenon has largely favoured US headquartered companies, with the flow and availability of risk capital much greater in the US than it is in Europe: US capital markets are more tolerant of volatility whereas in Europe and Japan investors typically favour stable earnings and lower risk at the expense of profit. This is also reflected in EBIT margins which show that profitability in European companies is remarkably clustered around the safe 15% range, whereas US performance is much more variable.

Though US-headquartered companies are in a more convenient location for accessing the US capital markets, non-US companies are now finding ways to participate. For example one of the drivers behind Sanofi's collaboration with Regeneron was a desire to access US-based capital for innovation. Many European biotechs are now choosing to list on NASDAQ for similar reasons. That said, finding ways to deploy the abundant capital available without destroying value is the hard part, as those who have engaged in ill-conceived M&A have demonstrated over the years.

Bespoke business models show the way

The successes of the highly diverse Global 100 companies show there is no one right answer to creating value in pharmaceuticals. Every model can work, and there is no inherent need to follow the crowd as many Big Pharma do: essentially betting on high risk innovation to fund high price treatments and thereby keep delivering new products. This diversity is illustrated by analysis of revenue per employee, which is a good proxy for labour intensity:

There is no one-size-fits all business model for the Global 100



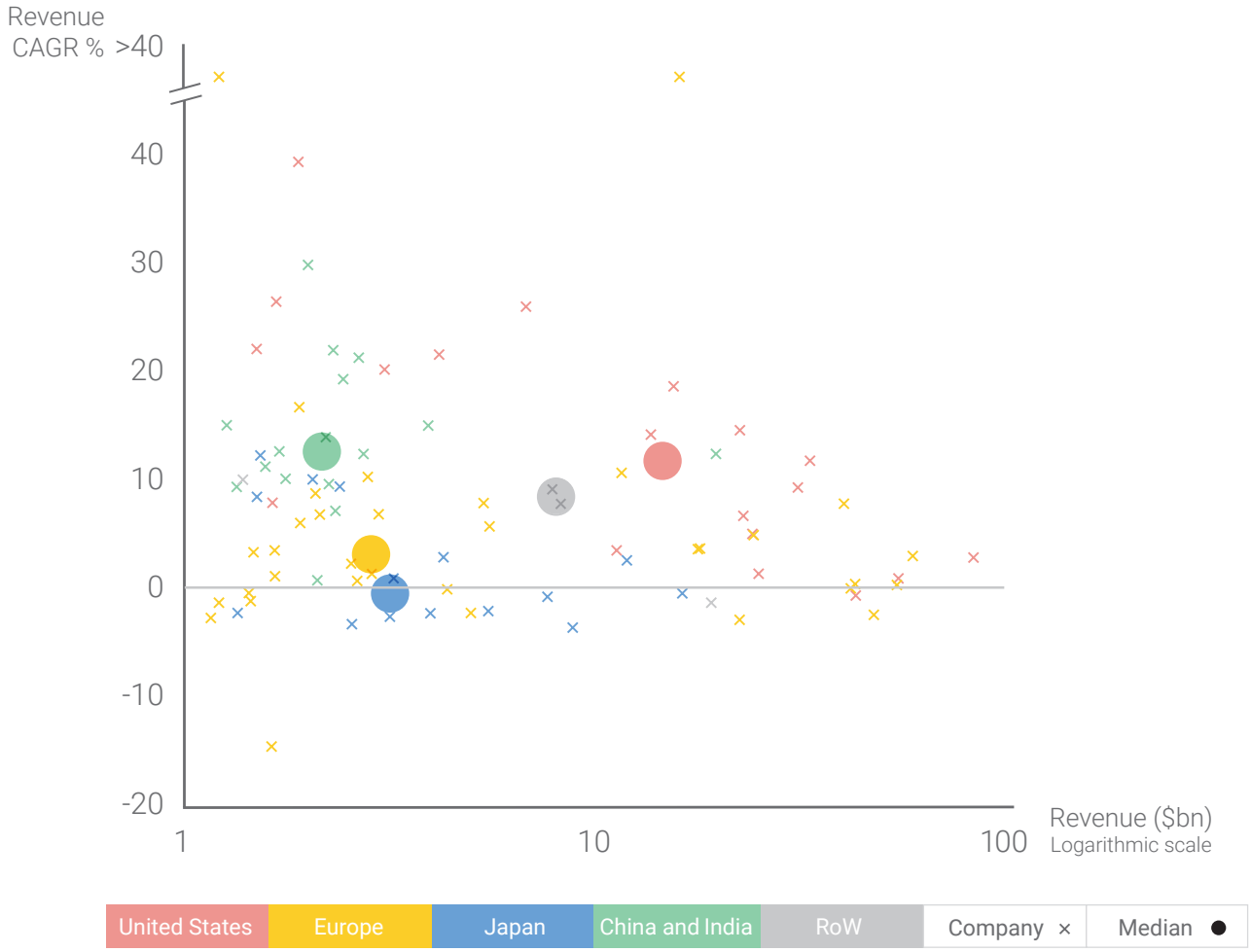
This shows a massive variation in labour intensity across these companies. Chinese and Indian companies generate far less revenue per employee than their US counterparts: an approach that is highly appropriate for companies that typically focus on manufacturing high volume generics for domestic and global markets. It also shows how Chinese and Indian organisations are playing to their strengths and being sensitive to regional economic conditions. The emerging presence of these

companies in the Global 100 – not least Shanghai Pharma in 18th place – indicates that this model works for them at the moment. We expect that the evolution of the Chinese and Indian companies in future, as some seek to embrace more lucrative innovation, will be a major influence on the future healthcare landscape.

Growing revenue with some intrinsic limits to growth

It is notable that although five year growth for many of the Global 100 companies has been impressive, the top ten pharma companies have struggled to grow their top-line performance at the same rate:

Pharmaceutical companies have clear limits to sustainable growth



In the top 10 companies, outside of the top two players, J&J and Roche, only two other companies posted five year revenue CAGR of more than 1%: the more diversified Fresenius (7.7%) and AbbVie (11.8%). Three large companies – Bayer (-2.6%), Merck (-0.8%) and GSK (-0.2%) – are falling back, with the remainder experiencing essentially

flat top-line growth. Around two thirds of all Japanese companies in the Global 100 yielded negative compound revenue growth, with only two posting five year CAGR in double-digits: Sawai (12.2%) and Santen (10.0%). The highest-placed Japanese company, Takeda, experienced negative compound revenue growth (-0.6%).

Outside the top ten, there are plenty of growth success stories: in the first quartile (the top 25 companies), Allergan (43.4%), Celgene (18.7%), Gilead (14.6%), Biogen (14.2%), Shanghai Pharma (12.4%) and Abbott (9.2%) have all achieved impressive top line growth in the last five years. Some smaller companies, particularly in the US, have shown even stronger growth rates. However, rapid growth comes at a cost and can be very challenging to sustain. The biotechs that have grown their top line have been incredibly profitable, but now they have to do it again: AbbVie has had incredible success with its product Humira, but that revenue is now at risk from biosimilars; Celgene's difficulties with creating a replacement for its blockbuster Revlimid made it vulnerable to being acquired; Gilead's extraordinary success with Sovaldi left it with a difficult problem to keep the revenue flowing; and Biogen's shares have slumped following a major setback in its Alzheimer's clinical candidate designed to fill a revenue gap.

The growth challenges faced by even the more successful companies reflects a basic characteristic of the pharma industry: once patents expire, the revenue from innovative products that have been successful typically declines precipitously on generic entry. Replacing that revenue is hard, never mind growing on top of it, as it requires companies to constantly create new products and healthcare solutions to just stand still. This makes the pharma industry stand out from other industry sectors such as consumer goods and more recently information technology, which compete more on the basis of enduring customer relationships and brands that can sustain revenues for decades rather than short-lived patent-protected product monopolies.

Growth in emerging countries may provide a pointer to addressing the growth challenge. Sun Pharma (15.0%), Hengrui (21.3%), Aurobindo (19.3%) and CSPC Pharma (30.0%) are among a number of Indian and Chinese companies that have achieved double-digit five year revenue growth, albeit from a much lower base than the larger Big Pharmas. These successes, driven by branded generics in domestic markets, show that growth does not necessarily require the high patent-expiry risk that comes with innovative pharmaceuticals.

The Global 100 provides a clear picture that, at the top end of the industry, Big Pharma has recognised the difficulties in getting good margins from incremental innovation and is instead preferring a more breakthrough-led innovation game. Most of the top companies are betting big on high-end innovation: Gilead has followed its $11bn bolt-on acquisition of Pharmasset with a $12bn gamble on Kite

Pharma's CAR-T pipeline; Celgene bet big on CAR-T too, with a $9bn bolt-on of Juno Therapeutics; and Sanofi has expanded its rare blood disorder franchise with the $4.8bn purchase of Ablynx. The examples are numerous. Time will tell whether these approaches pay off.

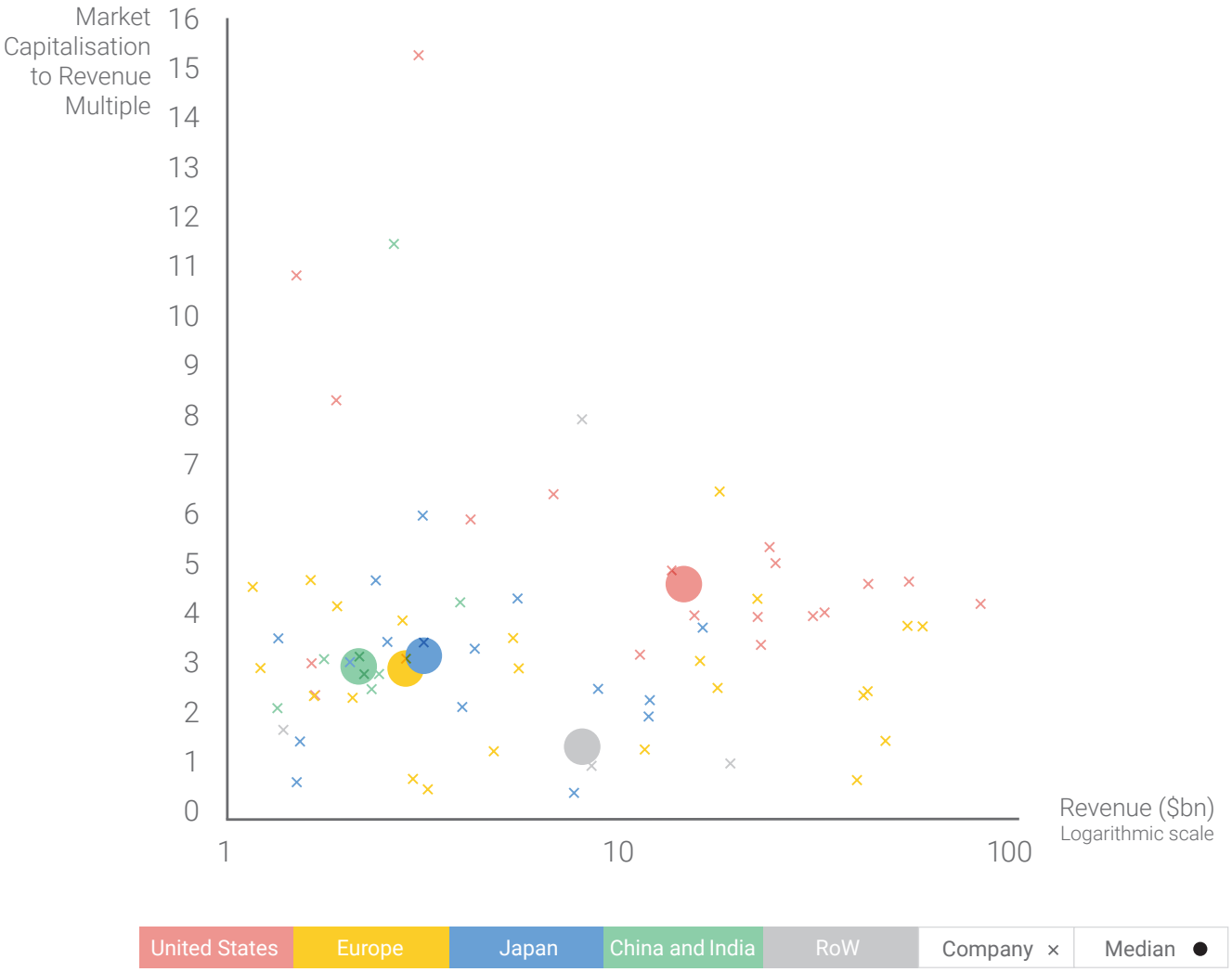
An alternative solution (beyond high-risk innovation) to the growth conundrum that many have extolled is to essentially "buy revenue" through M&A, but now that route is also seemingly blocked by investors who are wary of the perceived – and often destructive – effect of mega-mergers in the industry. Takeda's share price did not recover from previous highs by purchasing Shire; the BMS and Celgene merger has been roundly criticised by several investors; Allergan had to withdraw its interest in Shire when its share price decreased by 7% just on announcement of interest; Pfizer was unable to acquire AstraZeneca or Allergan. This list goes on, with investors seemingly chastened by the disaster of the serial M&A company Valeant, now Bausch Health, in 2015-16.

Therefore, there are clear limits to growth at the very top of this industry. Growth in top line revenue is ultimately required for profitability growth, as cost-cutting can only get you so far. Investors now know that there are genuine diseconomies of scale in pharmaceuticals, particularly in innovation. One way round this is a more diversified healthcare model than pharma-only – as Fresenius and Abbott, Roche, and J&J have demonstrated with reasonable growth rates in the last five years. Of the other top ten companies that are more pharma focused, growth has been more elusive – only AbbVie (11.8% CAGR) has achieved more than 1% CAGR over the last five years from its success with Humira; this growth is not likely to be sustainable after its patent expiry. The others have struggled to keep the top line moving upwards.

Capital allocation successes

The best financial measure for successful capital allocation is ultimately the future net cash flows that are expected from the company. For listed companies, the market capitalisation forms a good proxy for this, reflecting the market's (or analysts') perception of how likely and how large future cash flows will be from the company. Furthermore, the sales multiple (market capitalisation divided by annual revenue) provides a normalised rating of future prospects in relation to the scale of the company measured by the revenue that has been generated to date:

US companies outshine their global peers in the eyes of investors



In the first quartile (top 25) of the Global 100, US companies are typically more highly rated than their European peers. Companies with high sales multiples include Merck & Co., Pfizer and J&J: Merck & Co.'s success with Keytruda, Pfizer's capital discipline and J&J's relentless growth and smart acquisitions are clearly being rewarded by the market. In Europe, the most successful company – Roche – has been built around a classically European long-term culture. Yet much of Roche's success has come from its initial partnership followed by acquisition of US-headquartered Genentech, which was a highly strategic move that has been executed well and driven huge profits. However, with imminent patent expiries putting major revenues at risk, the question for Roche is: what next? It continues to play long and invest in innovation, but like all other companies betting big, only time will tell.

Fundamentally, the current successes shown by both US and other non-US companies align with the heritage at the root of each organisation: great products and/or great technologies, sustained by a clear purpose. Together, they demonstrate the value of having a coherent and bespoke 'reason for being' – underpinned by a focused business model, aligned capabilities and a willingness to collaborate to bring in competencies that aren't part of their core.

The question for the European and Asian companies that are not yet achieving the sales multiples of their US counterparts is: how can capital allocation improve matters? To answer this it pays to look at the roots of the sales multiple challenge. For example, is it the US pharma companies' willingness to take risks, encouraged by a capital market that is more sympathetic to risk, that helps them out-perform the non-US companies? Or the non-US companies' cultural heritage of playing it safe, encouraged by investors that see pharma as a safe haven? These are undoubtedly factors, and one of the reasons that European and Japanese pharma companies are increasingly exploring the US both as a market opportunity and as a potential source of innovation and/or capital. Those that don't explore the US for these reasons may well be destined to slower growth and lower sales multiples, albeit with less potential volatility than the US companies. This leads us to the fundamental issue of the innovation model: it's a clear choice to be confronted, and needs to reflect both investor preferences and the core ambition of the company itself. We explore this in the next section.

2. Innovation Model

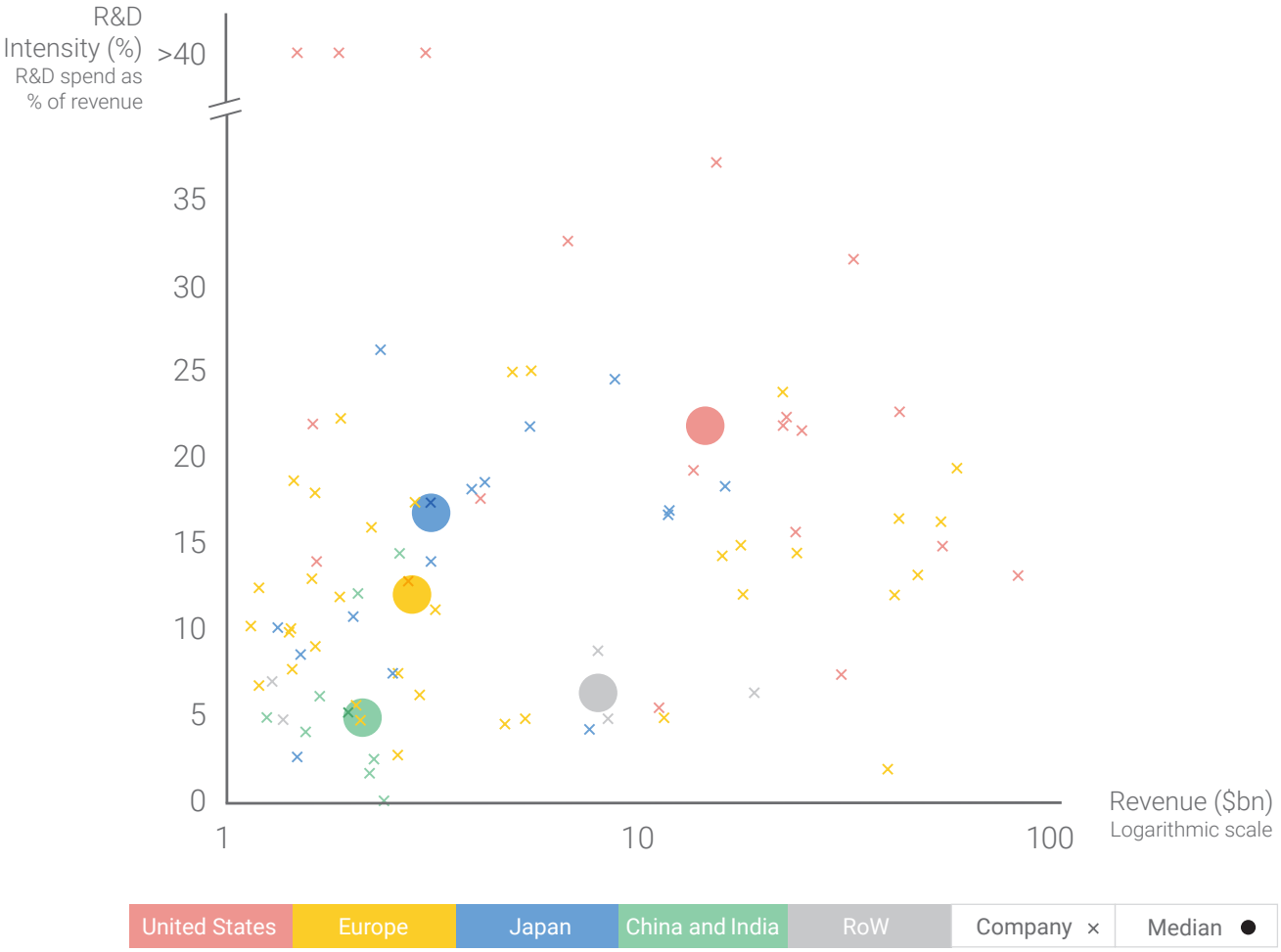
The pharmaceutical industry has been responsible for significant advances in healthcare over the last few decades, with much of the pioneering original innovation now being applied to great effect from a global healthcare and human longevity point of view, through a mix of generic and consumer business models. This success has required a tremendous financial commitment to innovation, which has typically been called Research and Development, or R&D, reflecting the two core elements of getting a drug product to the point where it is approved for launch: the initial *research* (or discovery) to create a new molecule and the subsequent *development*, both non-clinical and clinical, to test whether it is safe to administer in humans, and whether it works.

The industry has got so used to calling its innovation 'R&D' that this rather product-centric view of the world still persists, even though there are many other viable innovation models that incorporate non-drug elements such as digital technologies, diagnostics and patient engagement. To recognise the familiarity of the R&D term we will use it in this report, while acknowledging that in the future innovation needs to be much more customer oriented and holistic than this narrow 'how-to-make-a-drug' definition suggests.

R&D intensity: a major and sustained commitment to innovation

The scale of the Global 100's investment in R&D is enormous, totalling more than $160bn in 2018. The largest Global 100 companies invest heavily in innovation both as an absolute amount and as a proportion of revenues – the R&D intensity – with a median R&D intensity of 16% of sales among the top 25 companies:

R&D intensity tends to increase with scale, with individual exceptions



Though R&D intensity is generally high, some companies in the Global 100 spend significantly less: 11th placed Abbott invests under 10% of revenue in R&D, whilst 9th placed Fresenius spends less than 5%. This is down to both companies deploying diverse models beyond pharma that require less R&D investment, with the former also operating in devices, nutrition and diagnostics, and the latter providing hospital services.

Certainly, investing in R&D is more difficult today than it was a decade ago. Larger companies are finding it harder to justify sustained large R&D investment, both to capital markets and shareholders, especially in terms of the internal R&D spend that comes out of the Profit and Loss (P&L) account every year. The market no longer allows companies to invest much more than the generally accepted median R&D intensity unless there's a very compelling story, such as excitement in a specific product or technology. Those stories are often found in smaller US companies. The three outliers investing more than 40% of revenues are lower-ranked US companies; Vertex (49th), Incyte (73rd) and BioMarin Pharma (86th). Investments made in external R&D through M&A (that does not have an immediate hit to the P&L or R&D spend number) appears, at the moment, to be more favoured by the market, though time will tell whether these pay off fully.

The scale of R&D investment by the Global 100 suggests that increased size generally gives investors the confidence to enable companies to invest more in R&D. However, this does not mean that the investment is more productive. The heavier R&D investment and intensity in the top quartile companies is more a by-product of business model choice (high-risk innovation) than it is an indication that bigger is better when it comes to R&D productivity.

R&D productivity is still an issue

The issue of R&D productivity in pharma has been a long-standing topic of industry debate. In 2010, Sanofi's then CEO, Chris Viehbacher, asserted that Big Pharma isn't good at the "*creative process of innovation*", controversially claiming that "*the best people who have great ideas in science don't want to work for a big company*." Moncef Slaoui, former head of research at GSK, famously said that science in Big Pharma is "*overridden by management*", recommending that companies "*move away from industrialised R&D*". The notion was further developed by Morgan Stanley which in 2010, argued that Big Pharma should "*exit discovery and create value*".

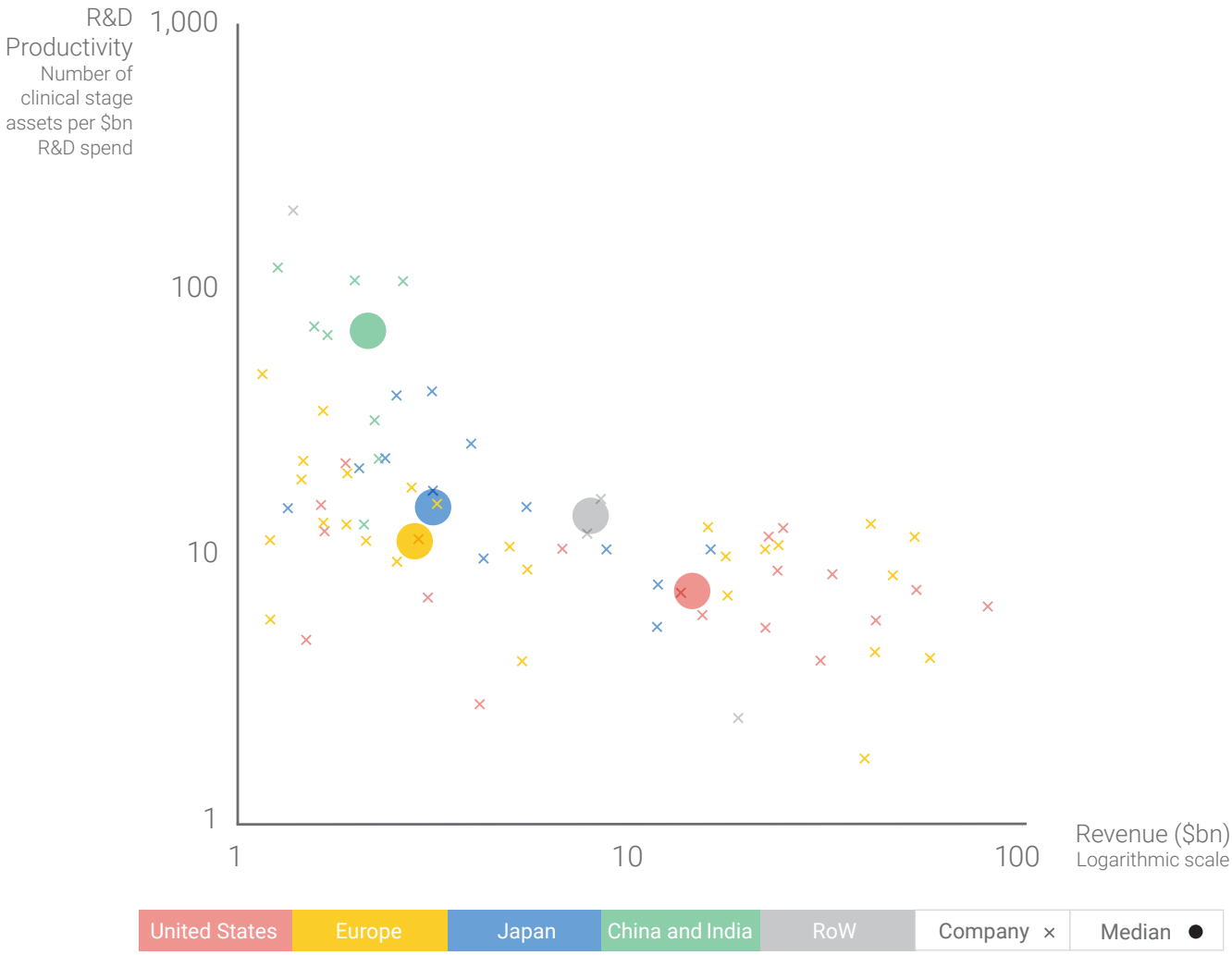
Almost a decade later and the R&D productivity debate still rages. As the Global 100 illustrates, Big Pharma still invests substantially in R&D – though in some cases that's likely to be just because it can. The corporate profit margins are there to afford it and the investors are supportive – for now – and we expect this to evolve over the next years.

In fact, whilst R&D productivity remains a challenge, the industry is still generating a healthy number of new medicines every year. In 2018, the FDA set an all-time record for New Drug Approvals (NDAs), approving 59 novel drugs and biologics. However, the populations that new medicines address

appear to be getting smaller, with many targeting orphan or rare diseases, with less impact on healthcare for the broader global population. This industry trend towards a focus on highly innovative medicines for very few patients with terrible rare diseases is fantastic and life-changing for these small patient populations and their families. It is also appealing to pharma companies of all sizes as the prices are typically high and the commercialisation costs (in terms of headcount) are typically smaller. Yet it does beg the question of what the industry is going to be known for in the next decade: high-price, highly niched treatments for developed economies or innovation that benefits a broader population at lower price points?

A further measure of R&D productivity is the number of clinical (Phases I, II, III) assets that each company has in its development pipeline. Again, we normalise this metric to account for scale, exploring the number of assets per billion dollars of R&D investment:

Smaller companies support larger R&D pipelines per $bn invested in R&D



In terms of the number of assets in clinical development, this suggests that there may indeed be diseconomies of scale in R&D. The smaller, focused players typically have bigger clinical pipelines per R&D dollar invested than larger companies, despite the bigger companies investing more. This may be because Big Pharmas are conducting larger (and more expensive) Phase III trials, or that they have confidence in larger single trials that smaller companies cannot easily afford to risk. Also, the high number of clinical assets for the smaller Indian and Chinese companies is a feature of their generic and branded generic business models, where the cost to develop assets is much lower than for innovative pharma. Companies can therefore look at peers with similar business models and scale for inspiration. For example, when one Big Pharma can have double or more clinical assets per billion of R&D invested versus another with very similar revenue, the pipeline productivity question certainly needs to be asked.

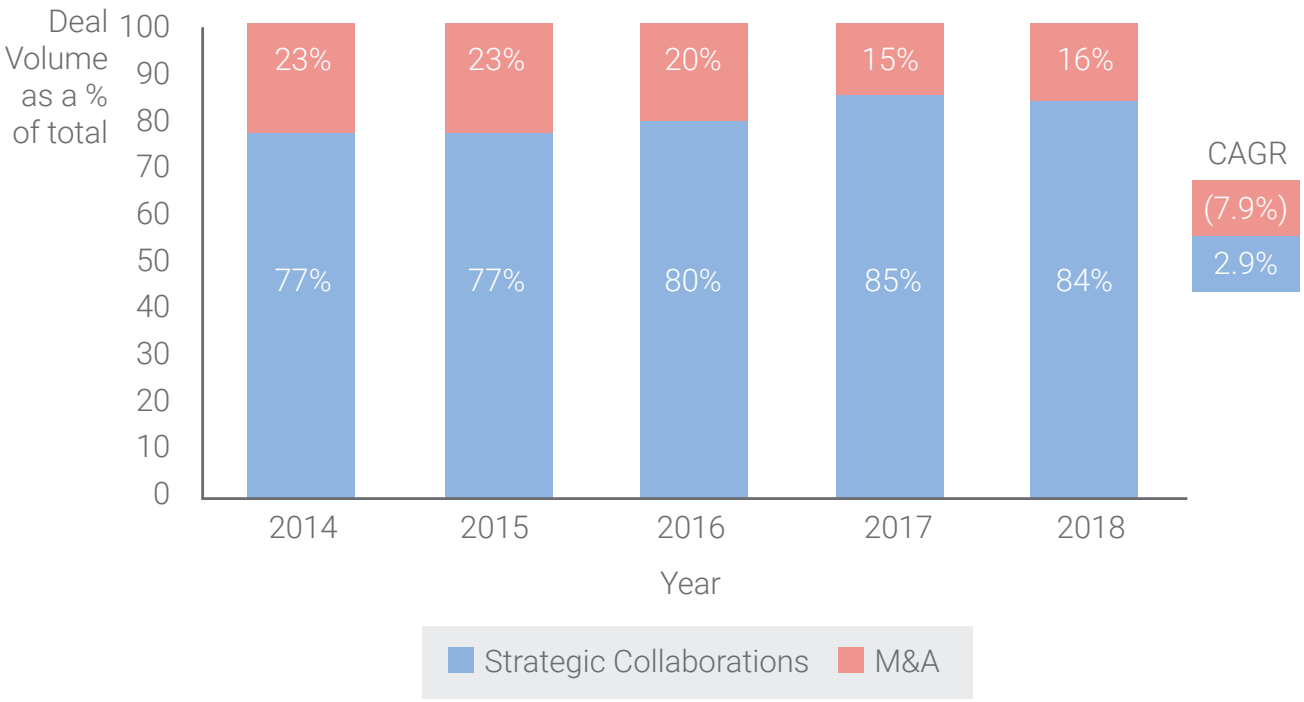
Strategic collaborations are becoming more favoured than M&A

Another important development is the upward trend for strategic collaboration in comparison with M&A as a method of improving R&D productivity. In 2010, Chris Viehbacher described how Sanofi had changed its approach to R&D by creating a network for strategic partnerships. At the time, he said:

"The traditional model is, we go to a biotech and say, we'll take your product, develop it, and pay you a royalty. Now we get our people to work with their people. And the partners are starting to work with each other. To be able to fund that, we took a hard look at our own internal pipeline. We did our equivalent of the banks' stress tests on our own portfolio and cut 30% of it."

The industry's appetite for strategic collaboration has grown considerably since 2010:

The Global 100 have been favouring strategic collaborations over M&A



The proportion of deals that are strategic collaborations in Global 100 companies compared with M&A deals has increased from 77% in 2014 to 84% in 2018, showing that the collaborative model to growth is becoming more popular than outright purchase and integration. This shift in proportion towards alliances has continued through both an increase in the number of total deals done between 2014 and 2016 and a decline in the total number since then. Furthermore the number of M&A deals done by the Global 100 is down as an absolute number by 28% in 2018 compared with 2014. These data suggest that pharma companies are seeing externalised innovation (i.e. blending external and internal, not simply buying innovation alone) as core to increasing R&D productivity. Leading companies are indeed "externally wired", tapping into global innovation through clever partnering and strategic alliances. There is mounting evidence that in the last years M&A has become too expensive for many companies, and the anticipated returns often do not materialise. There is more evidence that partnering is the path to improved innovation – so "let the biotech be" rather than integrate an acquired business and thereby risk destroying the science and losing talent.

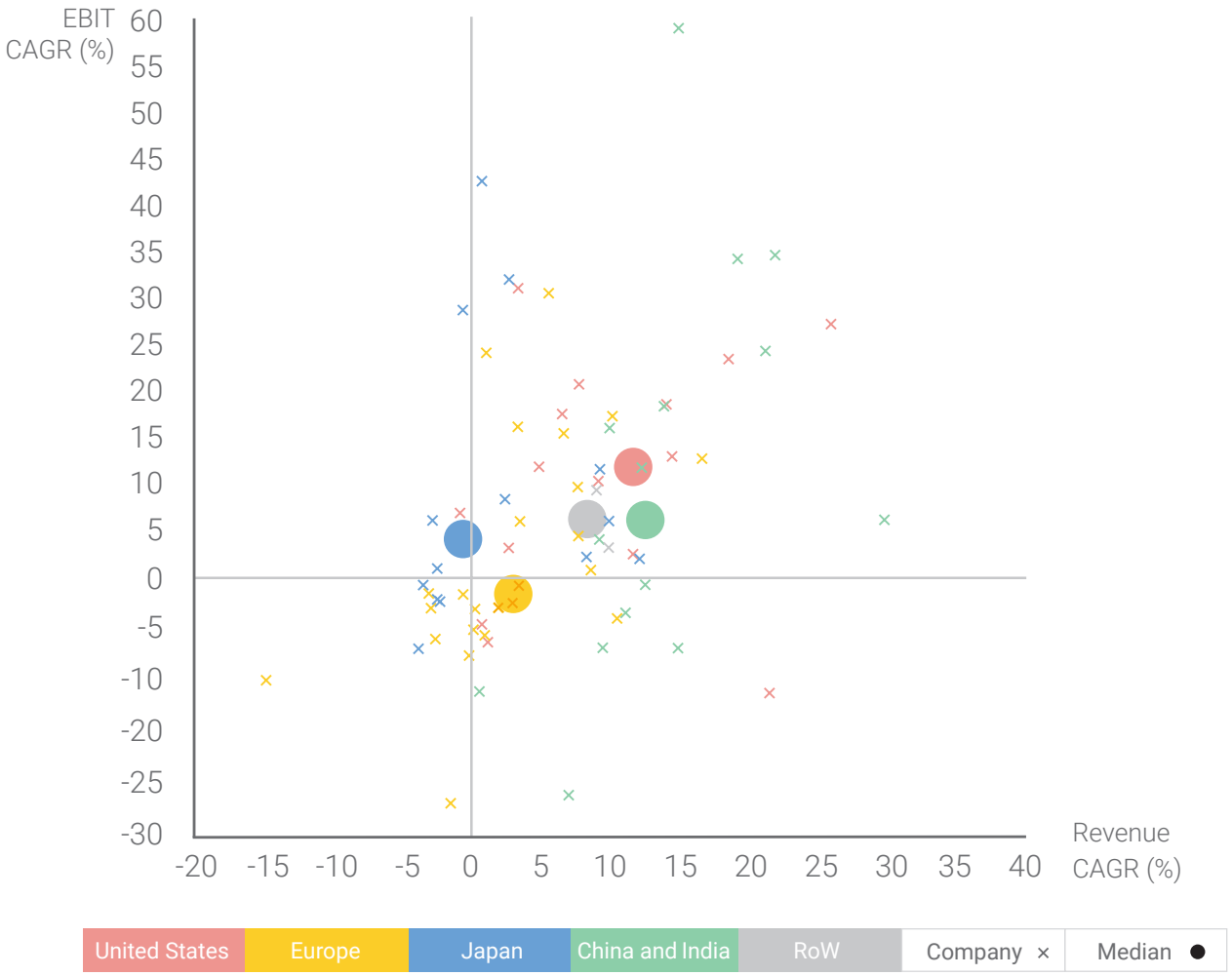
Bespoke strategic collaborations offer companies an opportunity to work on what they know best, grounded in the context of their distinctive capabilities and assets, and to apply that knowledge to partner with organisations that have complementary capabilities. Such collaborations can be transformative; however deploying them – whether for R&D or commercialisation – requires careful thought.

3. Commercial Model

Growth in the Global 100

The ultimate proxy of commercial success is top line revenues. However, this measure alone – evidenced by the virtue of being in the Global 100 – is relatively one-dimensional. Revenue growth is often much more revealing, particularly when a longer five-year timeframe is considered, and profitability must be considered as well: growing top-line while reducing profits is not sustainable.

The Global 100 have succeeded in both revenue and profitability growth



With some exceptions, the basic picture for the Global 100 is that top-line growth has been rewarded with profitability growth. The issue is therefore how to sustain top-line revenue growth through a commercial model that fits the business model choice of the company.

Volume vs Value: the core commercial model choice facing global pharma

One of the major trends to watch in the Global 100 over the next few years is a divergence between the high-resource commercial models required to play well in high-volume markets such as primary care and branded consumer care, and the more limited and personalised commercial models associated with companies that rely more on specialty care and rare diseases.

The difference between a value and volume play is best exemplified by the recent experience of GSK, which makes the company almost a microcosm of the industry. In 2015, GSK's former CEO, Andrew Witty described the "*enormous volume opportunity*" in emerging markets as the key to the company's long-term growth: *"The river is flowing for more volume. We're going to focus on that, get that volume out there at a fair price, get a good return on our R&D investment, but not be fixated on defending ever and ever higher prices in the developed world."*

However more recently GSK has signalled its intention to move away from its focus on bringing essential medicines to developing markets around the world. In 2018, Witty's successor Emma Walmsley, said: *"The most important changes that I wanted to make were, firstly, to focus again primarily on pharma, our biggest business, where we allocate the most capital – and which has the highest risk, highest return. And at the heart of that is R&D. Because I believe that is why a company like GSK should exist, and hopefully should endure, because we discover and develop medicines that make a meaningful difference… I wanted to get back to our R&D, and to our mojo around science and discovery and development again."*

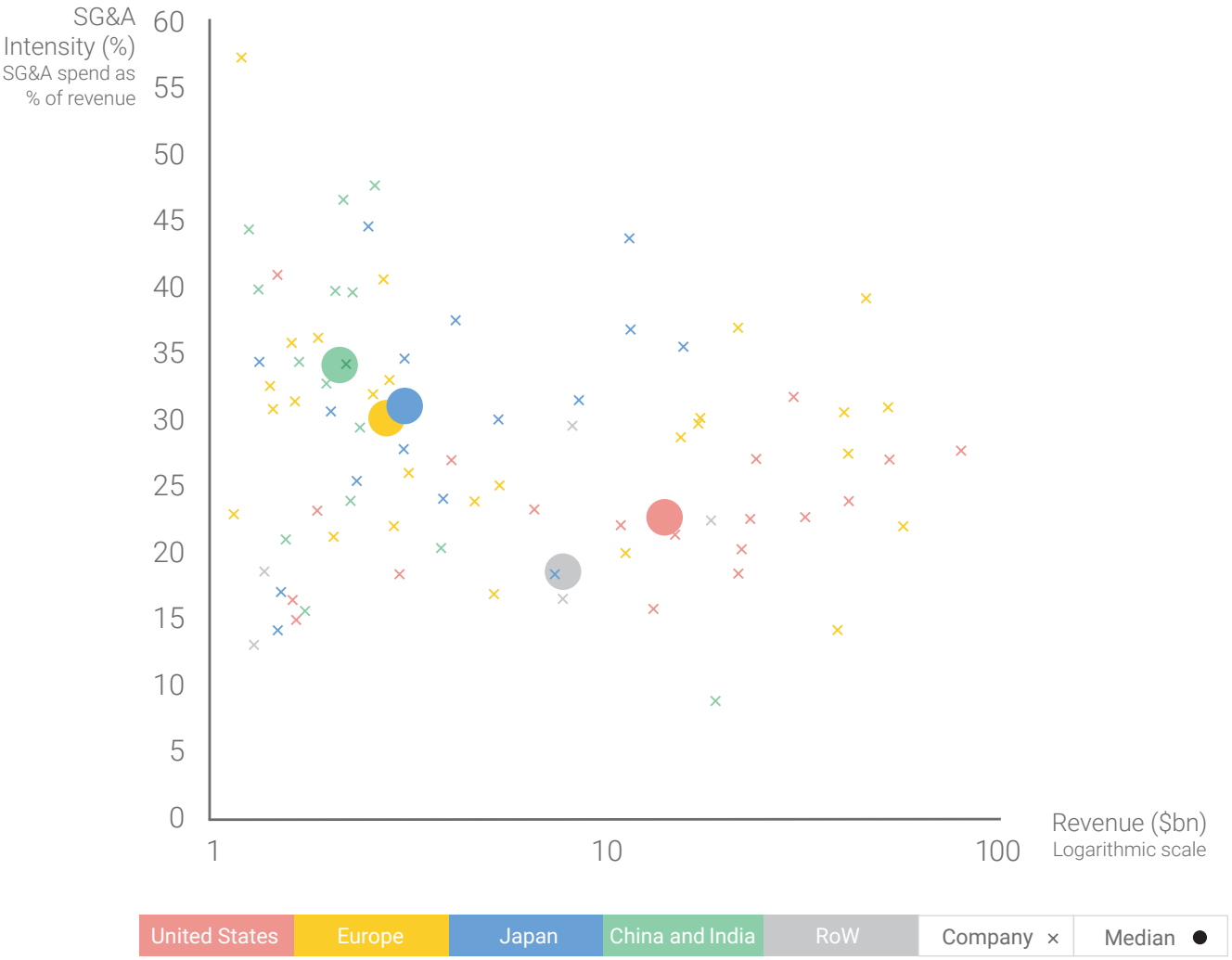
Since the start of 2017, GSK has cut or divested 80 programmes – a third of its portfolio – and refocused on the more high-priced developed-market pharma opportunities of immunology and immuno-oncology. Furthermore it has put its profitable consumer business into a joint venture with Pfizer, illustrating how the focus is now value, not volume. GSK's success with this refocusing is one to watch in future. Shifting culture from volume to value so quickly will not be easy, nor will delivering regular dividends to shareholders that have been accustomed to GSK's previously less risky volume business model.

GSK illustrates that maintaining a global commercial footprint is tough in regional and country markets with highly divergent healthcare needs. Its recent choice to partner with Pfizer for its consumer business shows how it has chosen to deal with this challenge by partnering rather than trying to build alone. Other companies have used regional and country partners to commercialise their older products in order to reduce commercial footprint and provide capital for innovation. Collaboration is therefore not just an R&D phenomenon for pharma companies, it is also a commercial one.

SG&A efficiency illustrates the burden of legacy

A second proxy of commercial effectiveness is capital efficiency, measured by Selling, General and Administrative Expense (SG&A) intensity – how much is spent as a percentage of revenue:

There is no single model for commercialising pharmaceuticals well



The wide variation of SG&A intensity – which typically ranges between 15-50% of revenue with outliers at both ends – essentially reflects the huge diversity in commercial models, which is itself dictated by focused business models and the inherent differences between volume and value plays. Fundamentally, speciality medicines tend to require less commercial investment than those for primary care, and this shows in the trend of lower SG&A intensity for the typically more innovative US companies compared to their European and Asian peers. Biogen demonstrates this efficiency well, with SG&A margin around 15%.

Biogen is among a number of 'newer' biotechs that are not weighed down by the 'burden of legacy' faced by more mature peers that are often outside the US – a huge portfolio of primary care products and regional country entities that are not all efficient, and are kept going to keep up top-line performance. Many of the long-standing companies in the Global 100 have, over time, established an unwieldy commercial footprint all over the world, much of which now sells mostly older products. Companies like AstraZeneca have worked hard to divest older products, but others have hung onto them at the expense of SG&A efficiency. In the first quartile, Roche has the most efficient SG&A margin, once again benefitting from its acquisition of Genentech, which, like Biogen, isn't troubled by the burden of legacy.

A more personalised and medicalised future for commercial models

As the industry shifts its innovation to specialty opportunities, smaller patient populations and niche indications, future commercial models will rely heavily on personalisation, where all aspects of an organisation's commercial approach will be tailored to individual patients, HCPs and payers based on their own unique needs. These future models will require agile marketing that leverages multiple data sources to drive personalisation. In tandem, the role of Medical Affairs is being reconfigured to play a more strategic role in influencing R&D and commercial decision-making. As healthcare professionals increasingly turn to Medical Science Liaisons (MSLs) for a better understanding of complex science, Medical Affairs is in a unique position to amplify the patient voice in pharma organisations, yielding new and powerful data sets that can help fuel personalisation. These two trends are shaping a new future for SG&A, and we expect to see corresponding changes in this metric in the future.

The successful companies of tomorrow will be those that adapt their commercial models in response to the emerging era of personalisation. This will require substantive change to processes, capabilities and culture to facilitate more agile, data-driven and tailored marketing, and an increased integration of Medical Affairs input into commercial and R&D thinking.

Conclusion: Shaping healthcare through diversity and collaboration

The Novasecta Global 100 illustrates that companies that have pharmaceutical interests can be highly successful, whether they choose to be volume or value players, or to build around great products, technologies or more diversified activities. The sheer geographic and business model diversity of the industry's top 100 companies demonstrates this phenomenon.

However the industry is still vulnerable to market and technology shifts. Advances in therapeutic innovation and breakthrough technologies present both opportunity and an enduring challenge to balance risk with opportunity. Constantly shifting healthcare currents – led by increasing demand, finite resources and the global drive for universal health coverage – require vigilance and corporate agility to keep ahead of change. Similarly, the unique but endemic challenge of patent expiry dictates the fundamental need to strengthen and evolve capabilities continually. Standing still is not an option.

To sustain a Global 100 position, or enter into the ranking, companies must therefore pursue a single-minded focus on the three key value drivers we have discussed: capital allocation, innovation model and commercial model. This means making good and consistent choices across all areas: the business model and purpose; the therapeutic, geographic and technological innovation focus; and the commercial basis for success. To underpin this, companies must also be choiceful about the capabilities they need in-house and those that can be better accessed through collaboration. The most successful won't follow the herd – they will be the best at what they alone choose to excel at.

To partner well with Global 100 companies, organisations must recognise the huge diversity within the industry and tailor their value propositions to suit each of the prospects they identify. There is a huge range of companies with growth aspirations. Our advice to organisations looking to partner is therefore to be both open-minded and creative. Rather than simply pursuing classic Big Pharmas, organisations should identify the companies with capabilities that are complementary to their own and customise their approaches accordingly.

Fundamentally, pharma is a highly diverse, global industry. It has to be: if a company has a breakthrough medicine that can transform a disease, it cannot simply be a local player, it must find a way of providing it to the world. Partnering for innovation and commercialisation makes that possible at every stage of a product's lifecycle and in every country of the world. That's why, in addition to being highly diverse, pharma is demonstrating the value of collaboration to shape the future of healthcare for an increasingly fragmented world.

The Novasecta Global 100

Rank by Revenue	Company	Listed (L) or Private (P)	Company Headquarters	Revenue ($bn)	Five Year Revenue CAGR
1	Johnson & Johnson	L		81.6	2.7%
2	Roche	L		58.1	2.9%
3	Pfizer	L		53.6	0.8%
4	Novartis	L		53.2	0.2%
5	Bayer	L		46.7	(2.6%)
6	Merck & Co.	L		42.3	(0.8%)
7	Sanofi	L		42.1	0.3%
8	GlaxoSmithKline	L		41.1	(0.2%)
9	Fresenius	L		39.6	7.7%
10	AbbVie	L		32.8	11.8%
11	Abbott	L		30.6	9.2%
12	Eli Lilly	L		24.6	1.2%
13	Boehringer Ingelheim	P		23.9	4.8%
14	Amgen	L		23.7	4.9%
15	Bristol-Myers Squibb	L		22.6	6.6%
16	Gilead	L		22.1	14.6%
17	AstraZeneca	L		22.1	(3.1%)
18	Shanghai Pharma	L		19.4	12.4%
19	Teva	L		18.9	(1.5%)
20	Novo Nordisk	L		17.7	3.6%
21	Merck KGaA	L		17.5	3.5%
22	Takeda	L		16.0	(0.6%)
23	Allergan	L		15.8	43.4%
24	Celgene	L		15.3	18.7%
25	Biogen	L		13.5	14.2%

Five year revenue CAGRs have been used for all companies except the following five, for which we have used a four year revenue CAGR: Otsuka, Perrigo, Mallinckrodt, Recordati, Green Cross Holdings

Negative CAGRs are signified by brackets, e.g. (0.1%)

The Novasecta Global 100

Rank by Revenue	Company	Listed (L) or Private (P)	Company Headquarters	Revenue ($bn)	Five Year Revenue CAGR
26	Astellas	L		11.8	2.5%
27	Otsuka	L		11.7	(3.9%)
28	Mylan	L		11.4	10.6%
29	Baxter	L		11.1	3.4%
30	Daiichi Sankyo	L		8.7	(3.8%)
31	Bausch Health	L		8.4	7.7%
32	CSL	L		7.9	9.1%
33	Teijin	L		7.6	(0.9%)
34	Regeneron	L		6.7	26.1%
35	UCB	L		5.5	5.6%
36	Eisai	L		5.4	(2.3%)
37	Grifols	L		5.3	7.8%
38	Servier	P		4.9	(2.4%)
39	Perrigo	L		4.7	3.9%
40	Menarini	P		4.3	(0.2%)
41	Sumitomo Dainippon	L		4.2	2.7%
42	Alexion	L		4.1	21.6%
43	Mitsubishi Tanabe	L		3.9	(2.5%)
44	Sun Pharma	L		3.9	15.0%
45	Mundipharma	P		3.4	n/a
46	Mallinckrodt	L		3.2	18.1%
47	Kyowa Kirin	L		3.1	(2.8%)
48	Shionogi	L		3.1	0.8%
49	Vertex	L		3.0	20.3%
50	Purdue	P		3.0	n/a

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The Novasecta Global 100

Rank by Revenue	Company	Listed (L) or Private (P)	Company Headquarters	Revenue ($bn)	Five Year Revenue CAGR
51	Endo	L		2.9	6.8%
52	Lundbeck	L		2.9	1.1%
53	Ipsen	L		2.8	10.2%
54	Hengrui	L		2.6	21.3%
55	Pierre Fabre	P		2.6	0.5%
56	Stada	L		2.6	2.0%
57	Taisho	L		2.5	(3.5%)
58	Aurobindo	L		2.4	19.3%
59	ONO	L		2.4	9.4%
60	Lupin	L		2.3	7.1%
61	Humanwell	L		2.3	22.0%
62	Ferring	P		2.3	n/a
63	Cipla	L		2.2	9.6%
64	Sino Biopharm	L		2.2	14.0%
65	Octapharma	P		2.1	6.7%
66	Dr. Reddy's	L		2.1	0.6%
67	Hikma	L		2.1	8.7%
68	Santen	L		2.0	10.0%
69	CSPC Pharma	L		2.0	30.0%
70	Chiesi	P		1.9	6.0%
71	Jazz Pharma	L		1.9	16.7%
72	Angelini	P		1.9	n/a
73	Incyte	L		1.9	39.6%
74	Cadila	L		1.8	10.1%
75	Kelun	L		1.7	12.6%

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The Novasecta Global 100

Rank by Revenue	Company	Listed (L) or Private (P)	Company Headquarters	Revenue ($bn)	Five Year Revenue CAGR
76	Insud Pharma	P		1.7	n/a
77	Intas	P		1.7	n/a
78	Amneal	L		1.7	26.6%
79	Gedeon Richter	L		1.7	1.0%
80	LEO Pharma	P		1.6	3.4%
81	United Therapeutics	L		1.6	7.8%
82	Vifor	L		1.6	(14.9%)
83	Hisun	L		1.6	11.2%
84	Sawai	L		1.5	12.2%
85	Nichi-Iko	L		1.5	8.4%
86	BioMarin	L		1.5	22.2%
87	Grünenthal	P		1.5	3.2%
88	Recordati	L		1.5	3.8%
89	Kowa	P		1.4	n/a
90	Bracco	P		1.4	(1.3%)
91	Krka	L		1.4	(0.6%)
92	Yuhan	L		1.4	10.0%
93	Hisamitsu	L		1.3	(2.4%)
94	Glenmark	L		1.3	9.3%
95	Green Cross Holdings	L		1.3	11.1%
96	Livzon	L		1.3	15.1%
97	Merz	P		1.2	(1.5%)
98	Horizon Pharma	L		1.2	74.8%
99	AlfaSigma	P		1.2	n/a
100	Orion	L		1.2	(2.9%)

Five year revenue CAGRs have been used for all companies except the following five, for which we have used a four year revenue CAGR: Otsuka, Perrigo, Mallinckrodt, Recordati, Green Cross Holdings

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THE NOVASECTA GLOBAL 100

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About Novasecta:

Novasecta is a specialist strategy consulting firm for pharmaceutical and biotech companies.

We provide practical solutions based on a profound understanding of the unique businesses and industry context of our clients. We deliver the strategic counsel, insight, and change that they need to drive performance improvement and sustainable growth.

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