Drive or be driven

Understanding the third wave of industry convergence

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Contents

Preface

We are in the midst of an unprecedented era of digital disruption, one which is characterised by the blurring of boundaries between traditional industries. The digitisation of everything, and improvements in technologies such as artificial intelligence, the internet of things, blockchain and new energy have created a foundation for companies to harvest synergies that would previously have been out of reach. In past decades it was difficult for a technology company to enter the automotive business unless it was a conglomerate with capital and scope. Such strategies are becoming increasingly mainstream now. The possibilities opened by digitisation have also encouraged a new breed of companies, which enter seemingly unrelated industries and challenge industry conventions that have been in place for decades. It is clear that the future of industries will be based on the success of these 'new entrants' as we know them today.

While we can see that these new challengers are at the crux of the ongoing industry convergence, it is knowing where they are most likely to thrive which will help us understand the extent of the disruption expected in each of our industries. Although all industries are faced with this new competition, the intensity of the impact they face is different. Some industries are still able to preserve their home ground for reasons varying from high regulatory scrutiny to expensive real assets. In this report, we examine the convergence trend in 11 industries to determine how it has grown over the years, which industries are already at the top of the disruption curve, and which are rapidly approaching this peak. We will also dig deeper into the cause and effect of convergence waves in the past – which factors have historically caused a rise in competition from outside the industry, and what effects have they had? Can the rise in new competition now cause a similar response in other industries?

This report also offers an outlook on industry convergence. Is it expected to continue growing at the current pace? What is the likely effect on industries? The latter question is critical to incumbents and regulators alike – is industry convergence inherently chaotic or could it bring positive change to industries?

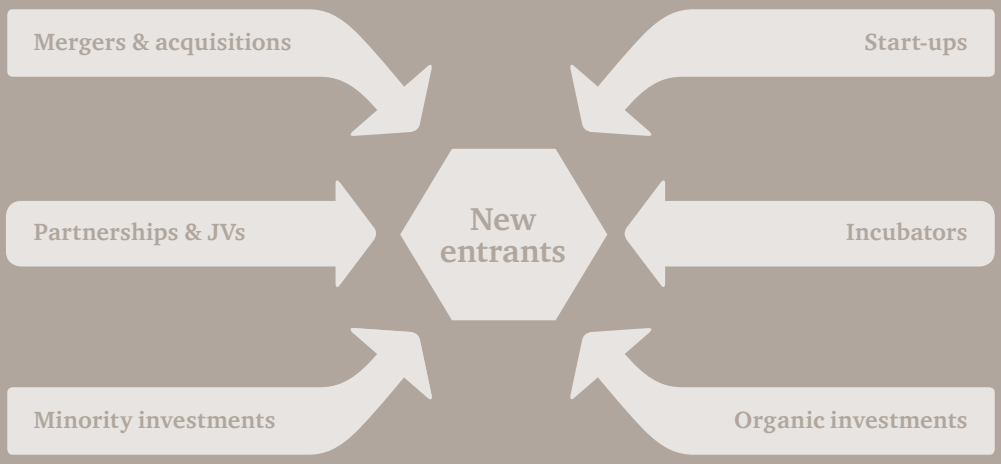
Jan Willem Velthuijsen
Chief economist, PwC Europe

Who are the new entrants?

Companies expanding their scope of operations from their core industry to relatively unrelated sectors are referred to as 'new entrants' in this report. These companies could be following one of many new entrant strategies including, but not limited to, acquiring targets in other industries, forming partnerships and joint ventures to capture new domains, or bringing new business models to established industries.

In this report, we look at mergers and acquisitions by incumbents, partnerships and joint ventures between industries and minority investments to assess how new entrants have behaved over the past two decades, and the causes and effects of such changes on industries as a whole. Other channels used to enter unrelated industries, such as organic expansion or start-ups, are not analysed in this report.

New entrant models

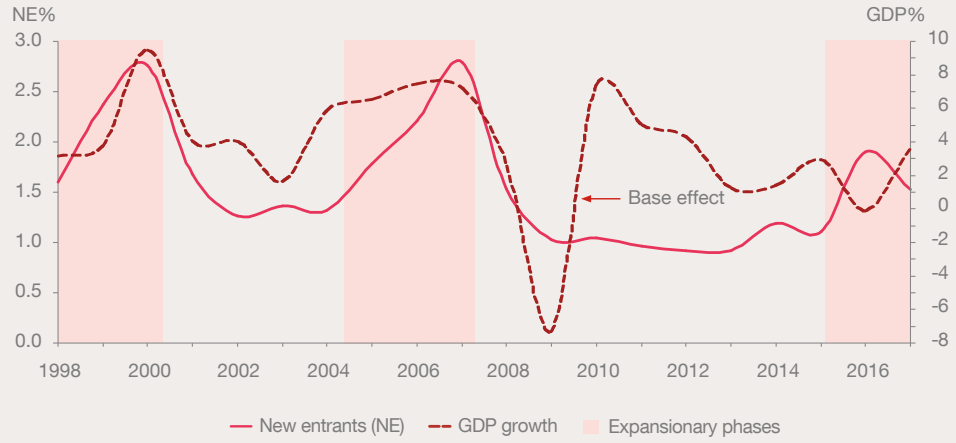


This study analyses 11 industries – automotive, consumer, energy, financial services, healthcare and pharmaceuticals, industrial manufacturing, media and entertainment, retail, technology, telecommunications and transport and logistics. All data discussed in the report relates to these industries in Europe, unless stated otherwise.
The report uses diverse source materials, including Thomson, IHS, ILO, Eurostat and OECD.

A fast-growing cross-industry world

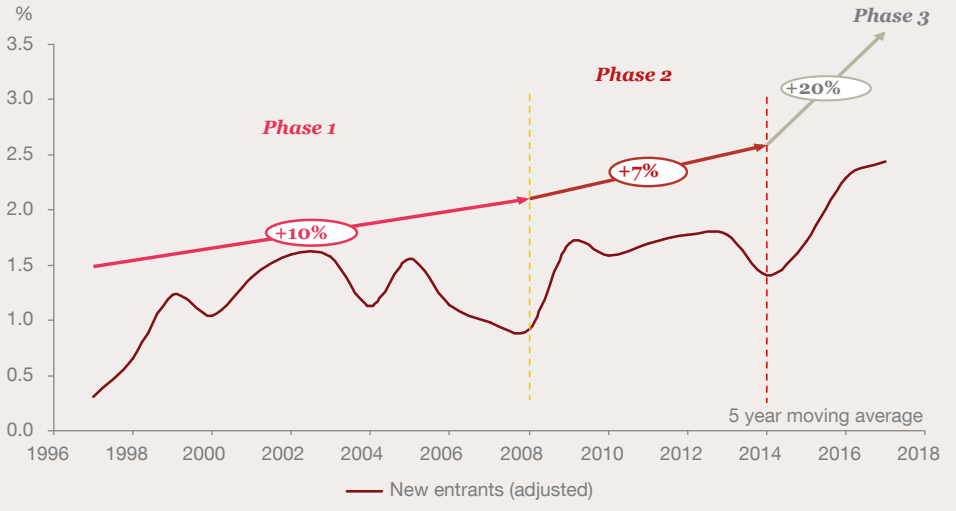
While digital disruption has manifested itself in various ways over the past decade, industry convergence is perhaps the most dominant of all its effects. We increasingly see examples of retailers acquiring technology companies, telecom players entering media and entertainment, and technology companies collaborating with automotive players. The world seems to be moving towards cross-industry value propositions, yet this is not the first time that industries are expanding beyond their core businesses. Convergence has been observed, and hyped, before. There have been several disruptive periods in the past during which companies have tended to enter non-core industries, with varying motivations.

Figure 1 Cross-industry activity is cyclical



Like all investments, cross-industry investments are highly sensitive to economic cycles. Europe has seen three major periods of economic expansion over the past 20 years, and, unsurprisingly, cross-industry activity has grown each time. While cross-industry activity includes transactions by institutional investors, these expansionary phases also reflect a period of elevated interest in strategically entering new industries.

Figure 2 New entrant activity in Europe is rising exponentially



Reduce the effect of economic cycles and we get a clearer perspective of how much faster industries have been converging over the years. Companies entering new, unrelated industries are certainly not a new phenomenon in Europe, though their growth rate over the past four to five years points towards a driver that is stronger than at any time in the last 20. The number of new entrants is growing exponentially[1], driven by the strong tendency of companies to explore new technologies and create customer-centric business models that are not restricted by traditional industry definitions. New entrant volume in Europe is currently stronger than at any time in the last 20 years.

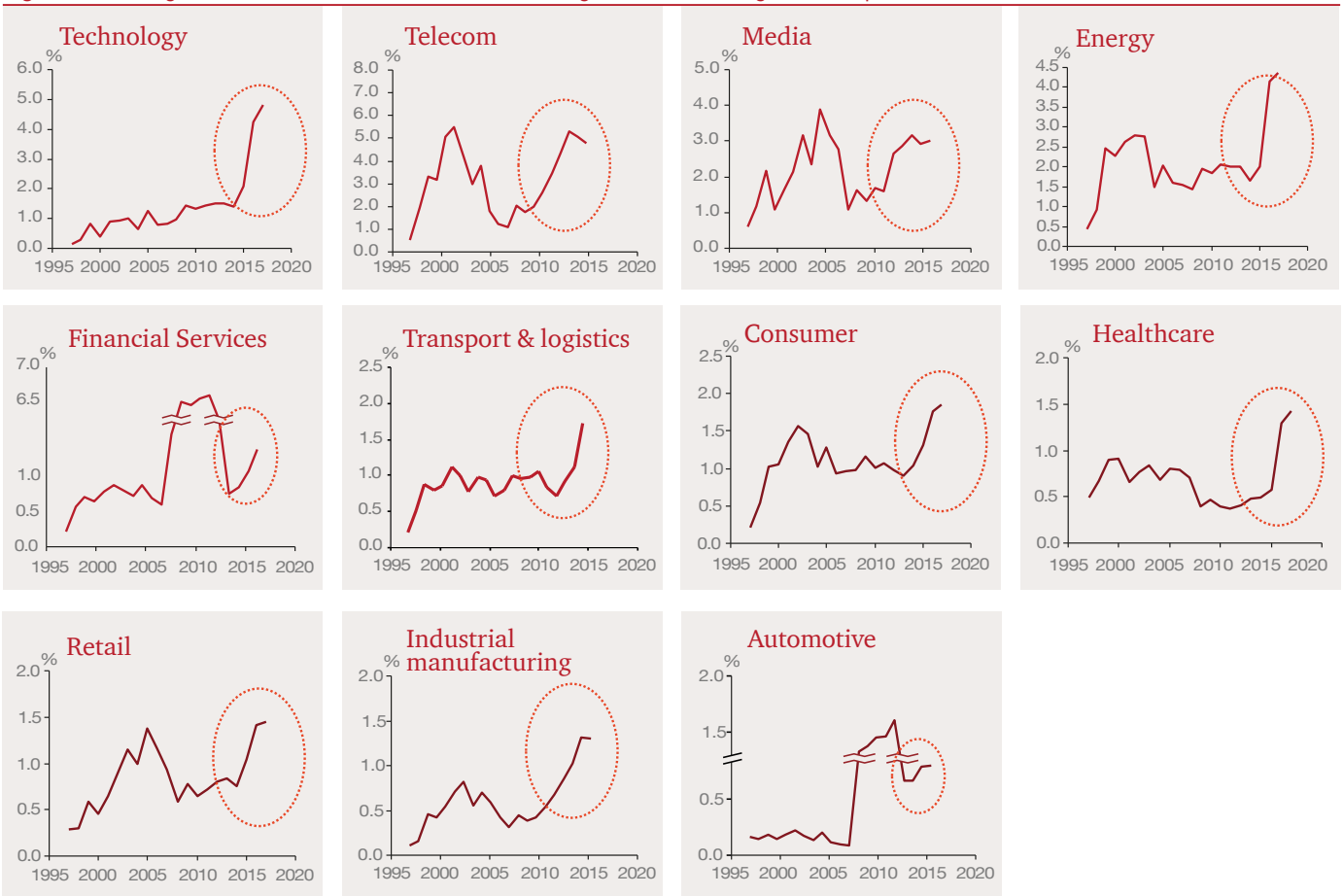
New entrant activity has been consistently rising over the previous two decades. We have seen three clear phases, each driven by a different factor and affecting different industries. The ***first phase*** came at the beginning of this century and was driven largely by the media and telecommunications industries. Digitisation of music and the proliferation of peer-to-peer file sharing platforms significantly disrupted the media and entertainment industry, while telecoms were affected by the rapid rise in wireless services.

Other industries were also dislocated in the early 2000s, though to a much lesser extent.

The ***second phase*** of new entrant activity, starting after the economic crisis of 2008, was largely driven by government investments flowing into the financial services industry (and to a lesser extent the automotive industry). In the aftermath of the crisis, governments made significant asset purchases in fragile banks to save jobs and prevent bank runs or collapses. This wave of new entrants was obviously quite exceptional in nature and not related to a strategic agenda of expanding in a new market.

The current and ***third phase*** of the trend is the most interesting, and not only because of the sharp spike in new entrants. Unlike the previous two phases, this wave of disruption is affecting industries across the board. All 11 sectors we analysed have faced a steep rise in new entrants over the last four to five years. The intensity of disruption differs by industry, but the unprecedented nature of this new wave can no longer be disputed.

Figure 3 Convergence 3.0: Industries are affected to differing extents, but along the same pattern

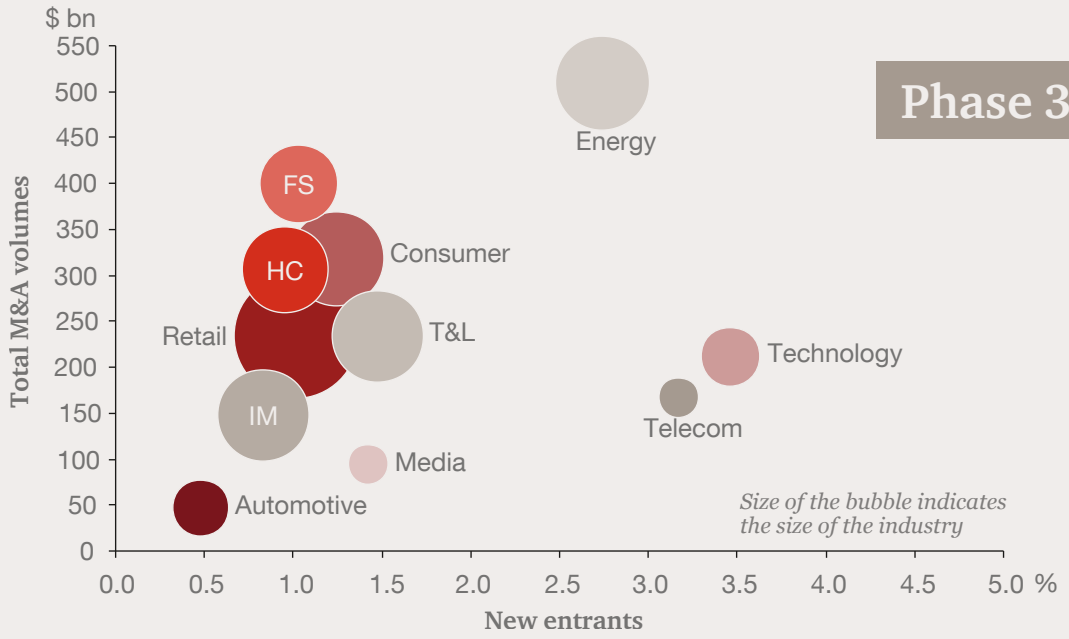


1 New entrant activity is measured in terms of transaction value as a percentage of industry size.

Adoption of new technologies is the dominant trend of Convergence 3.0

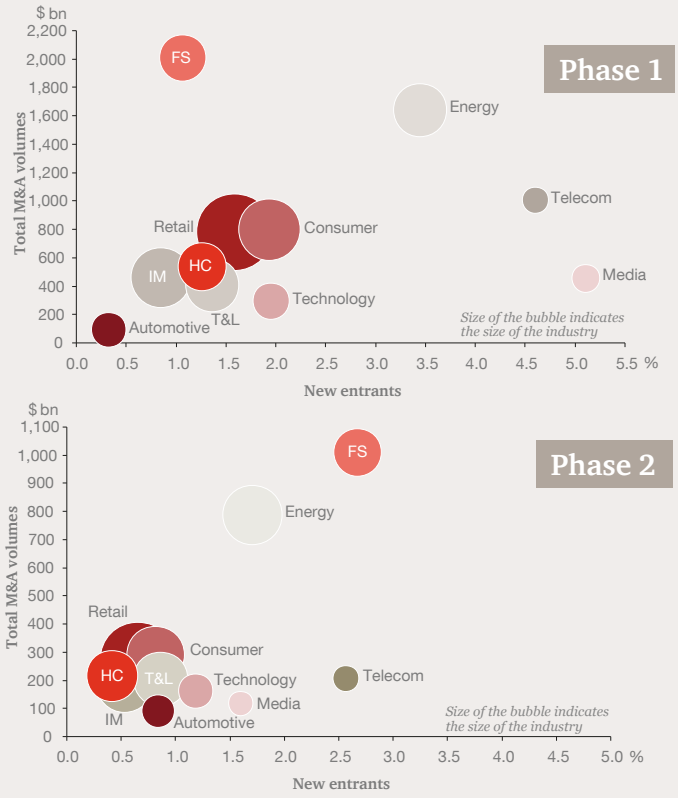
The current wave of new entrants has been fuelled by technological developments and the drive to capture cross-industry value propositions. The massive spike in the number of entrants in the technology industry emphasises the change brought about by rapid digitisation, and there is now an ever-increasing need, also felt by other industries, to invest in technology companies, not merely to innovate but also simply to remain competitive.

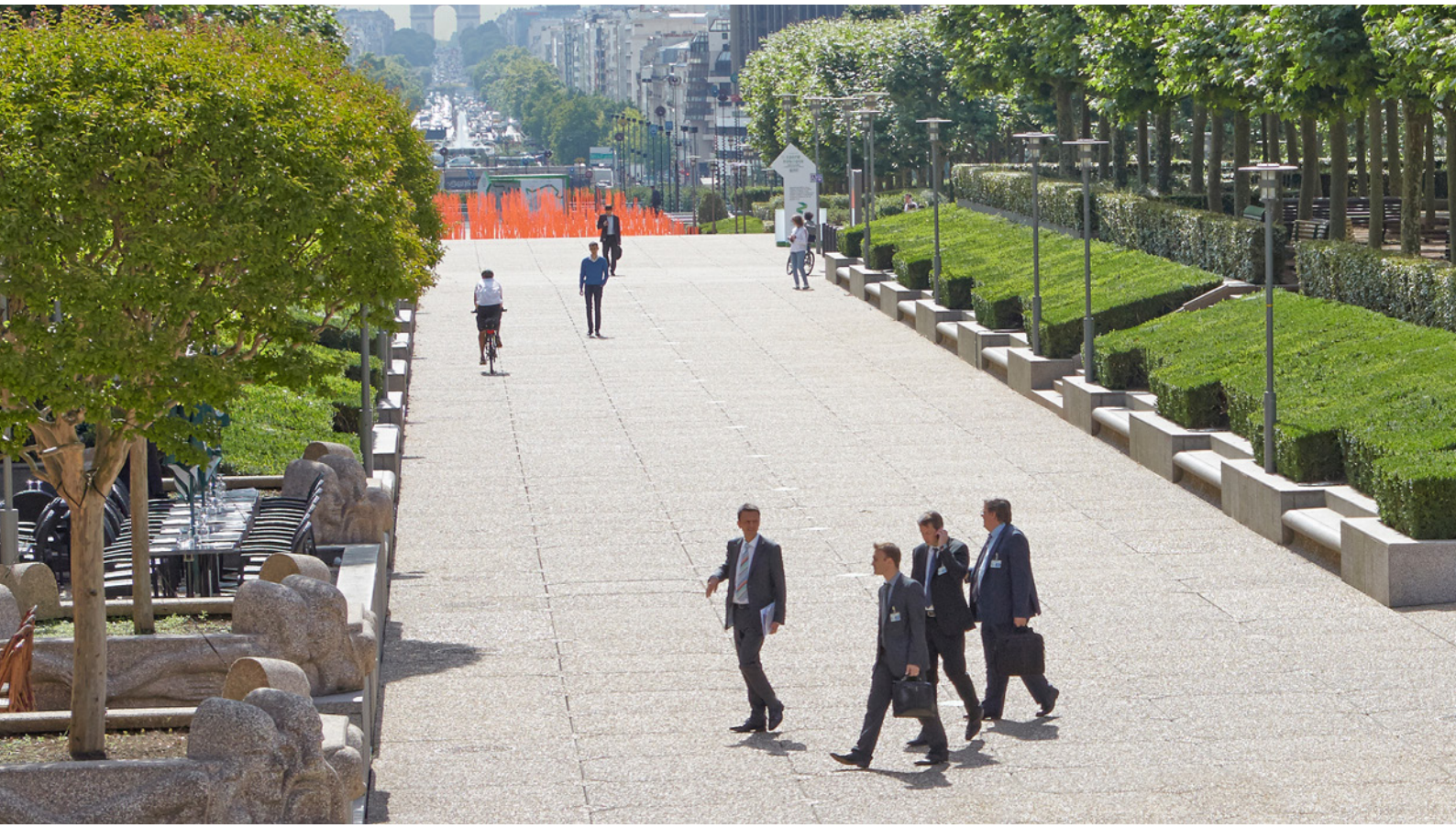
Figure 4 Technology has been the most targeted sector for inbound activity during this phase



Read our **Global Entertainment and Media Outlook 2018 - 2022**, for more on convergence in the E&M industry

Figure 5 Contrasted with phase 1 (Media and Telecom driven) and phase 2 (FS driven)





While all industries are affected by new technologies and the ongoing convergence wave, the intensity of change differs considerably. Telecommunications closely trailed technology as the most disrupted in 2017, followed by energy, transport & logistics and media, all of which are experiencing a great deal of emerging competition. New business models have materialised in most industries, notably affecting transport and logistics, where digital business models have become the new norm. The fact that this phase is evident in so many sectors implies that all industries will be redefined in the future, their value propositions spreading out and interlinking to create new value webs.

The current picture (as reflected in the 'phase 3' exhibit) holds important clues as to what is happening in each of the industries. Large-scale acquisition of technology is enabling companies to form new partnerships and exploit synergies where entry barriers are the lowest, leading to the development of new industry clusters. Knowing where these clusters are developing, and who the entrants are is crucial for incumbents if they intend to keep the entry barriers as high as they can be.

The rise of industry clusters

New clusters are being formed across industries. In a typical example, new entrants from multiple industries enter a newly formed industry cluster and are equally likely to be successful in the new domain. Mobility transformation[2] is arguably the most mature cluster demonstrating a convergence between multiple industries with similar synergy opportunities.

Read our report ***New Entrants – New Rivals:*** *How Germany's top companies are creating a new industry world*, for more.

Figure 6 Mobility Transformation

Much of the activity in mobility transformation is focused on making vehicles connected, preparing for a future of autonomous driving that is already coming into view. Also significant is activity around electro-mobility or 'e-mobility', focusing on the technology and business models needed to take us into a new era of e-mobility transport. Electro-mobility is predicated on ecosystems and infrastructure that cut through traditional borders in the energy and automotive sectors while calling upon expertise from other industries. The mobility transformation cluster therefore mirrors the widely known 'C-A-S-E' logic of connected, autonomous, shared and electric mobility.

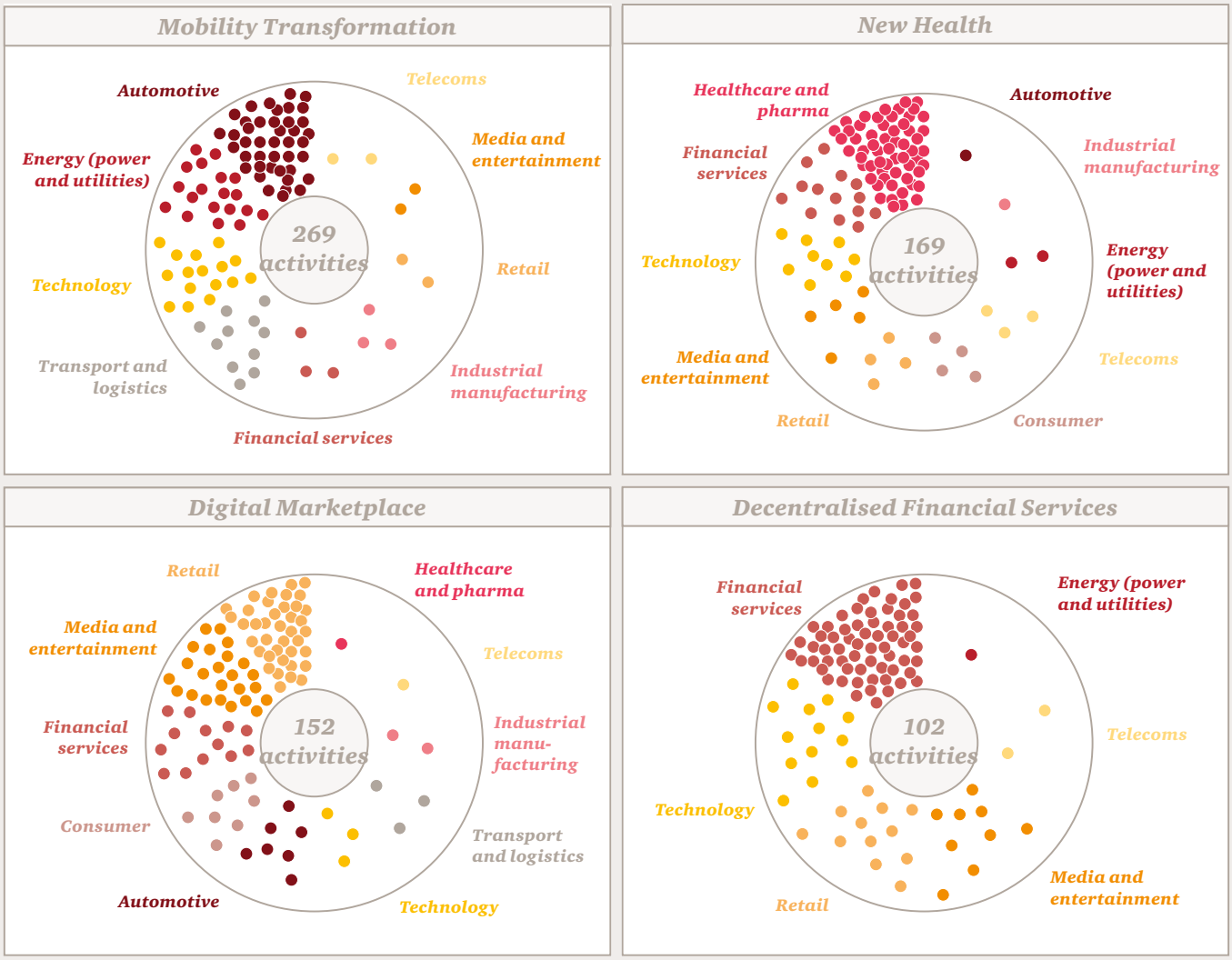
The electro-mobility segment of this cluster is a classic example of shared synergies between industries. Utility companies are positioning themselves as providers of charging solutions; at the same time, car makers are accelerating their own charging infrastructure efforts, leading to the development of a new cluster that sits at the intersection of two traditional industries.

2 This refers to the ecosystem of mobility, including connected, autonomous, shared and electric vehicles.

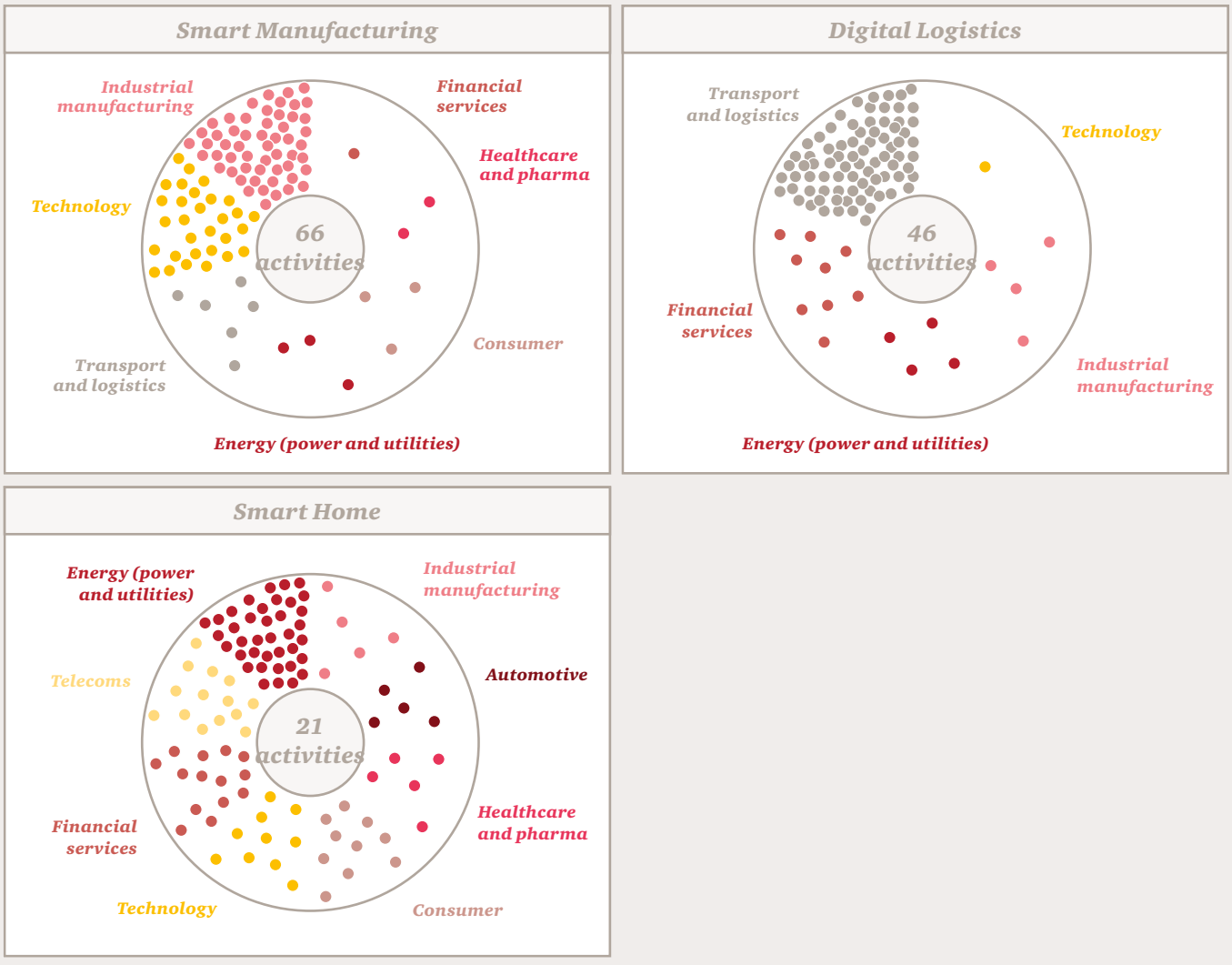
PwC has also conducted detailed research on cross-industry innovation and the development of various new clusters in Germany.

The rise in new technologies is leading to the creation of more such synergy pools situated between two or more industries. We expect to see the development of more such clusters, many of which are already in or past their early stages of growth. Most notable among them are Mobility Transformation (including automotive, technology and transport & logistics), New Health (bringing together healthcare & pharma and technology, as well as seven other industries), Digital Marketplace and Decentralised Financial Services (including financial services, technology and retail). Other clusters, like Smart Manufacturing,Digital Logistics, and Smart Home are also developing quickly.

Figure 7 New mega clusters are emerging from industry convergence[3]



3 Findings from an analysis of top companies in Germany.


Smart Manufacturing
Industrial manufacturing
Financial services
Healthcare and pharma
Technology
66 activities
Consumer
Transport and logistics
Energy (power and utilities)
Digital Logistics
Transport and logistics
Technology
46 activities
Financial services
Industrial manufacturing
Energy (power and utilities)
Smart Home
Energy (power and utilities)
Industrial manufacturing
Telecoms
Automotive
21 activities
Financial services
Healthcare and pharma
Technology
Consumer

Transcending boundaries continues but decelerates

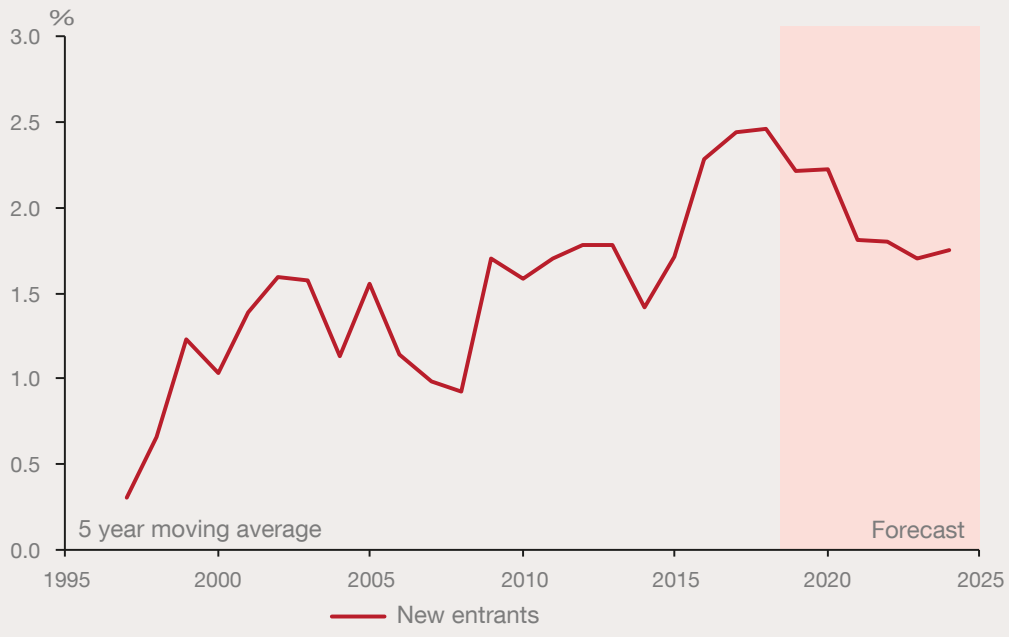
The development of new industry clusters shows no signs of slowing down. Driven by technological innovations and customer centricity, new entrants will continue to find synergies and to encroach on traditional industry boundaries. This of course means that the growth in the size and number of new entrants will continue – but at what pace? The overall macroeconomic scenario is expected to still have a strong bearing on the level of investments and how quickly industries are likely to converge.

Trends observed over the last 20 years imply that new entrants will continue on their long-term growth trajectory through the foreseeable future. However, our forecasts indicate that, in the short term, their growth may cool down somewhat. Although tech innovations will continue to help new clusters expand, the maturing of these technologies coupled with the effect of economic cycles will cause a slowdown in new entrant activity. As emerging technologies mature, companies are likely to grow capabilities organically as opposed to acquiring them externally or through partnerships with other industries.

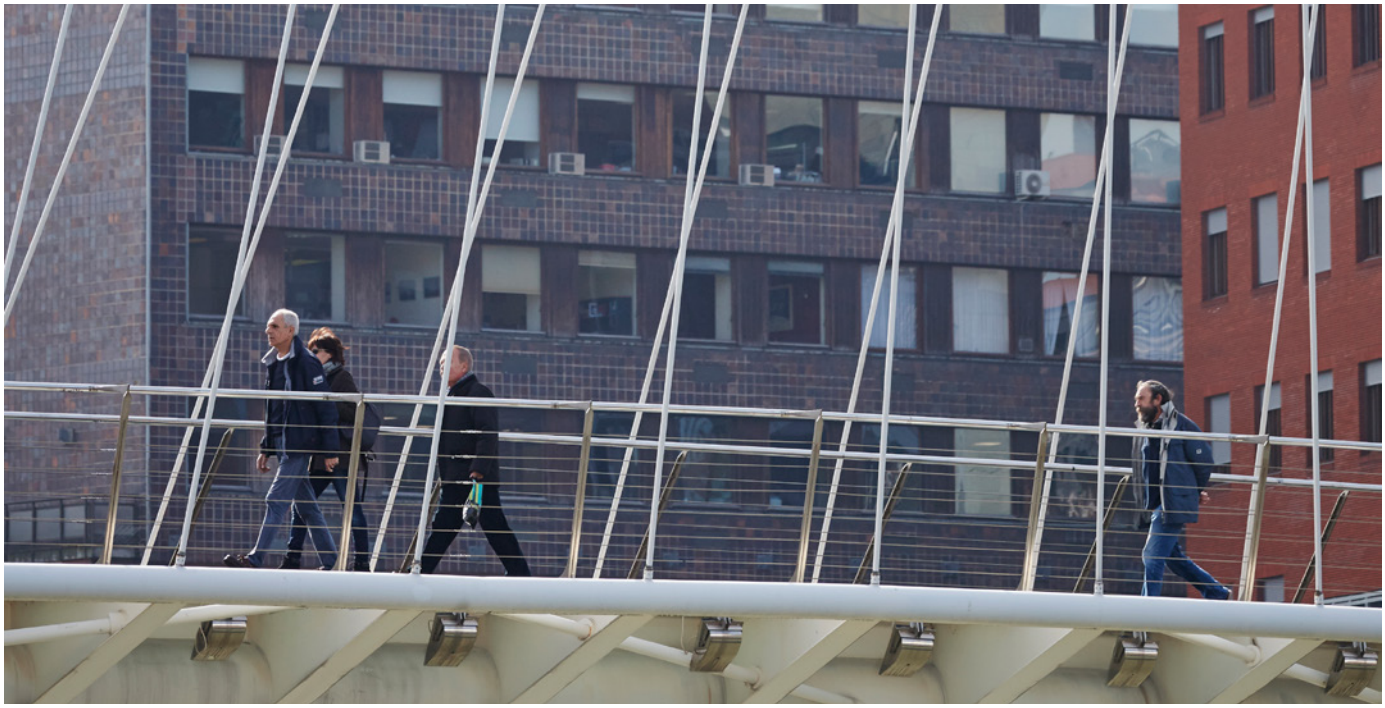
It is important to note that forecasts based on long-term trends do not account for nonlinear events, which are quite probable in fast-changing environments. Rapidly developing commercial applications of AI for example, could lead to a longer period of new entrant disruption.

Irrespective of how quickly companies enter other industries over the next five years, the disruptive effect of convergence has already started to be felt. The intensity of disruption in this phase has the potential to alter the dynamics of industries, including how they produce and add value, their competitiveness and the strategies they pursue to maintain their position. Perhaps the most critical effect that convergence can have is its effect on the productivity of industries.

Figure 8 Expected growth in new entrants



The efficiency effect



New entrant activity frequently leads to a rise in the intensity of competition and declining average profitability in the industry. When driven by technology and new business models, new entrants do not just bring more competition: they also have a fundamental impact on how industries generate output and how efficient they are in the process.

Industry convergence has a clear positive correlation with the real value added generated by industries. The more external competition an industry faces, the more added value it is likely to generate. This relationship also extends to employment – the more new entrants, the higher the level of employment the industry creates. This makes sense –more companies operating in an industry are likely to generate more output and employ more people. However, the impact of new entrants is even broader as they also have a strong effect on the productivity of industries. The implication is essential: more new competition makes industries more efficient, pushing them to produce more with less resources.

Productivity is key

Assessing the impact of new entrants on productivity is crucial, not least because it is a major driver of economic growth. It is one of the variables that influences all stakeholders – for businesses, increased productivity brings higher profit and opportunity for more investment. For workers, increased productivity can translate to higher wages and better working conditions. And in the longer term, increased productivity is key to job creation. For the government, increased productivity results in higher tax revenues[4]. If new entrants cause a positive impact on the productivity of industries, they can prove to be an effective lever for a productivity-focused development strategy. By encouraging new competition, regulators can stimulate the value creation in industries and increase productivity across the board.

Anecdotal evidence suggests that new entrants pioneer innovative technologies and business models which incite a better utilisation of resources. Our aim is to empirically evaluate this claim.

4 Source: ILO.

Methodology

Our hypothesis is that new entrants across industries have a causal relationship with productivity. For analysis purposes, productivity and influx of new entrants data were computed from their components. We considered the same 11 industries that we discussed in the first chapter, only this time the TMT industry is brought together under one head to ensure comparability between new entrant and productivity data. The analysis in this report is based on labour productivity defined as real value added per employed person. Although only a partial measure of productivity, labour productivity has the advantage that it is easily computable and relies less on methodological assumptions than other measures. There is also the practical consideration that it is possible to derive data on labour productivity covering a span of two decades.

$$\text{Impact on industry productivity } (P_{t,i}) = \left(\frac{\text{Employment}}{\text{Real value added}} \right)^{-1}_{t,i}$$

$$\text{Degree of influx of new entrants } (NE_{t,i}) = \left(\frac{\text{Vol. of new entrants}}{\text{Industry size}} \right)_{t,i}$$

In order to assess the causation, we used the first difference model (variables are transformed for the model by subtracting the current period's value from the previous period) to produce variables that are stationary and ensure results are relatively easy to interpret. The productivity data showed a wide variation in performance between industries and time periods. To account for such variations, dummies were included in the model.

SUMMARY OUTPUT						
Regression Statistics						
Multiple R	0.334					
R Square	0.111					
Adjusted R Square	0.072					
Standard Error	3.085					
Observations	216					

ANOVA	df	SS	MS	F	Signifi-cance F	
Regression	9	245.376	27.264	2.865	0.003	
Residual	206	1.960.540	9.517			
Total	215	2.205.916				

	Coefficients	Standard Error	t Stat	P-value	Lower 95%	Upper 95%
Intercept	2.204	0.630	3.498	0.001	0.962	3.445
Δ Degree of influx	57.576	16.227	3.548	0.000	25.583	89.569
Financial services	-1.288	0.891	-1.446	0.150	-3.043	0.468
Industrial manufacturing	-1.361	0.891	-1.528	0.128	-3.117	0.395
Consumer	-1.460	0.891	-1.640	0.103	-3.216	0.296
Automotive	-1.529	0.891	-1.717	0.088	-3.285	0.227
Retail	-1.791	0.891	-2.011	0.046	-3.547	-0.035
Transportation & logistics	-1.932	0.891	-2.169	0.031	-3.688	-0.176
Healthcare & pharma	-2.040	0.891	-2.291	0.023	-3.796	-0.284
Energy	-3.052	0.891	-3.427	0.001	-4.808	-1.296

The regression model clearly points towards a causal relationship between the number of new entrants and the productivity of industries. It is important to note that there is considerable diversity in the industries analysed and the effect each one faces because of new competition. The model accounted for industry-specific variations and found a significant difference between the industries. The strongest impact of new entrants is seen in technology, media and telecoms (TMT), which are likely to see the most positive effect on productivity as a result of more new competition. Industries that follow closely on the heels of TMT include financial services and industrial manufacturing.

The regression model clearly points towards a causal relationship between new entrants and the productivity of industries. It is important to note that there is considerable diversity in the industries analysed and the effect each one faces as a result of new competition. The model accounted for industry-specific variations and found that the difference between the industries was significant. The strongest impact of new entrants is seen in the TMT industry, which is likely to see the most positive effect on productivity as a result of more new competition. Industries that follow closely on the heels of TMT include Financial services and Industrial manufacturing.

What does this causality mean for the future of industries?

Technology is expected to continue enabling companies to enter non-core businesses. Will the new entrants continue to increase the efficiency of industries uninterrupted, enabling them to produce more and more with less resources? What will happen when the influx of new competition slows down as technologies mature or when the economy goes through another recessionary cycle?

Figure 9 Relationship between new entrant activity and industry productivity

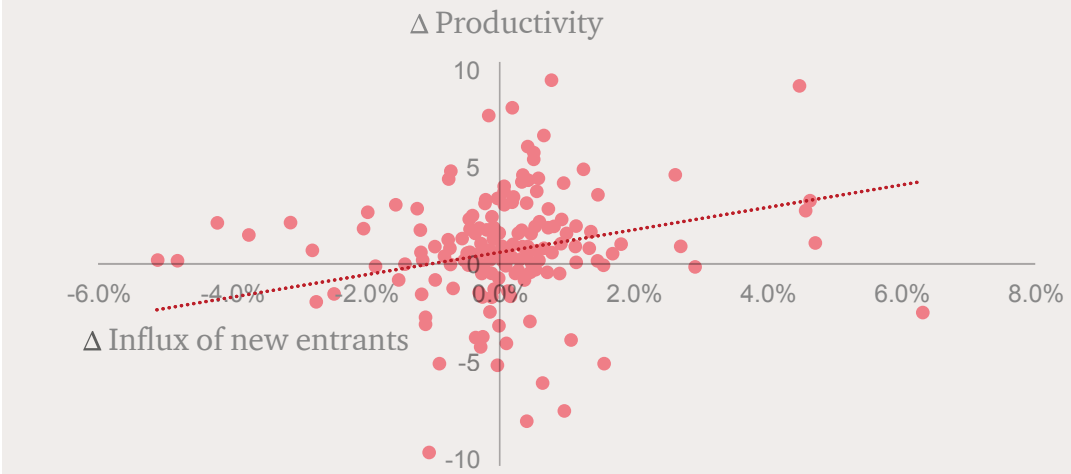


Figure 10 Influence of the influx of new entrants on the productivity of industries over the past 20 years

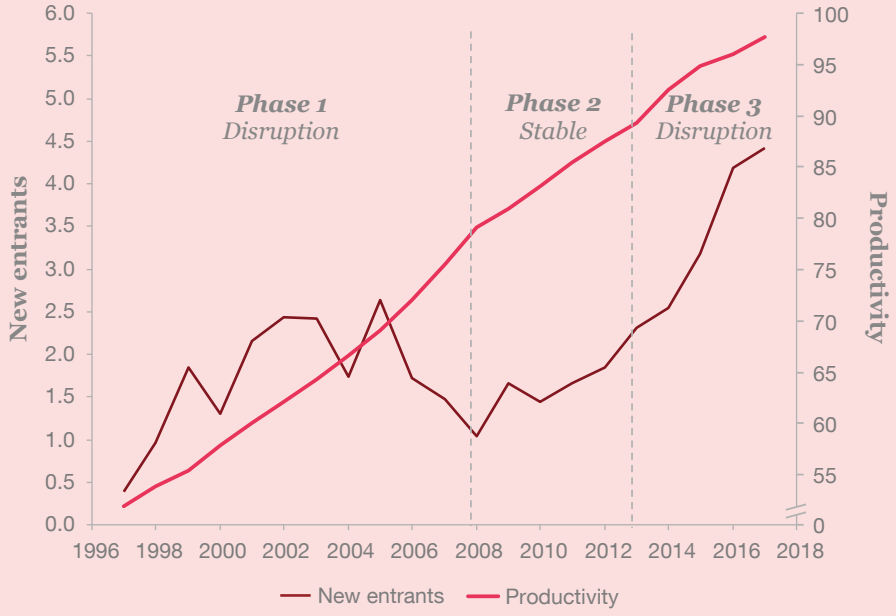
Industry	Average productivity 1993 – 2017[5]	Productivity growth (absolute) per year due to growth of influx
TMT	75.0	2.25
Financial services	123.6	0.95
Industrial manufacturing	36.5	0.85
Consumer	30.3	0.76
Automotive	26.1	0.67
Retail	44.0	0.42
Transportation & logistics	78.0	0.34
Healthcare & pharma	43.1	0.18
Energy	138.9	-0.82

5 Real value added (thousand 2010 USD) per employee.

TMT is a classic case

Technology, media and telecoms (TMT) have acted as a flag bearer of disruption in a lot of ways. Many conditions faced by these sectors in the early years of the first decade of the 21st century are, in essence, similar to the ones faced by other industries at present. TMT was affected by the digitisation of services, new and transformative business models, a boost in start-up activity and the blending of value propositions between technology, media and telecoms. The effect of these changes on the sectors has been transformative, and reflects the opportunity and challenges facing industries in the current environment.

Figure 11 Disruption in the TMT industry



The first wave of disruption in TMT set off a persistent rise in productivity. The gains from the disruption continued through the economic slowdown phase, even though the performance of several individual companies suffered severely. The new business models brought in by digitisation in media and wireless in telecoms caused a domino effect on the productivity in TMT, which was not mirrored in any other sector – not at first, at any rate. Now that all industries are on the verge of a digital disruption, might we expect something similar to happen across all industries?

Rise in convergence could cause large-scale productivity improvements

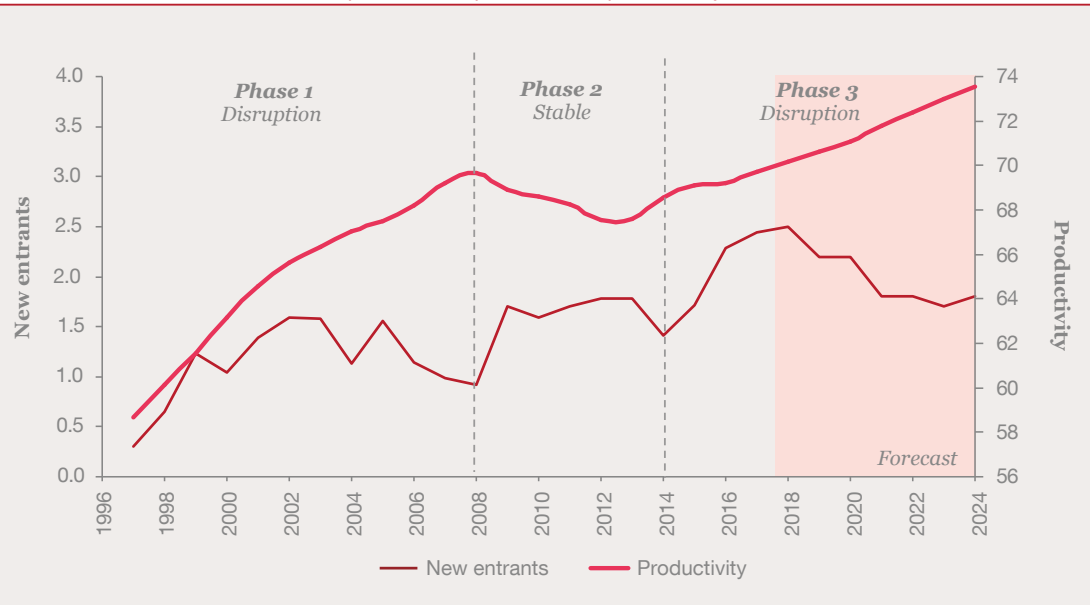
If the TMT model is anything to go by, the acceleration of convergence across industries could lead to large-scale productivity improvements in the future. Our analysis indicates that productivity improvements in the industries that had slowed down during the economic crisis period restarted about five years ago. It continued increasing as more and more new entrants started flowing into traditional industries, bringing innovative technologies and models with them.

Our forecast suggests that the wave of new entrants might be at its inflection point and will probably cool down over the next five years.

However, that is expected to have little effect on productivity, which is projected to continue increasing through the foreseeable future. Productivity gains from the disruption can foster sustained improvements in demand and boost overall economic growth, making competition from new entrants a very desirable effect in industries.

The impact on incumbents, on the other hand, may not be consistently positive. Many of the benefits produced by new competition are also likely to be reaped by new entrants, as opposed to industry incumbents. With more gains up for grabs, the importance of the right expansion strategies cannot be emphasised enough at this time.

Figure 12 New entrants have set off a persistent improvement in productivity of industries



Staying ahead

A more efficient future is certainly something to look forward to. It will mean better utilisation of resources and improvements in the performance of a range of industries. The appearance of new entrants will also have other effects, however, which will be challenging in equal measure. As productivity grows in one industry, the overall profit pools available to players evidently increase – but the same cannot be said of profit margins. There is a clear negative correlation between a rise in the number of new entrants and the profitability of players.

This does not imply that the profitability of all players will shrink. Instead, declining average profitability will conceal winners and losers. Backed by better products and synergies, some players will improve their margins, while others will suffer. This raises an important question – in the long term, will new entrants perform better than companies that choose to focus on their traditional businesses?

Figure 13 Relationship between new entrants and total industry profit pool

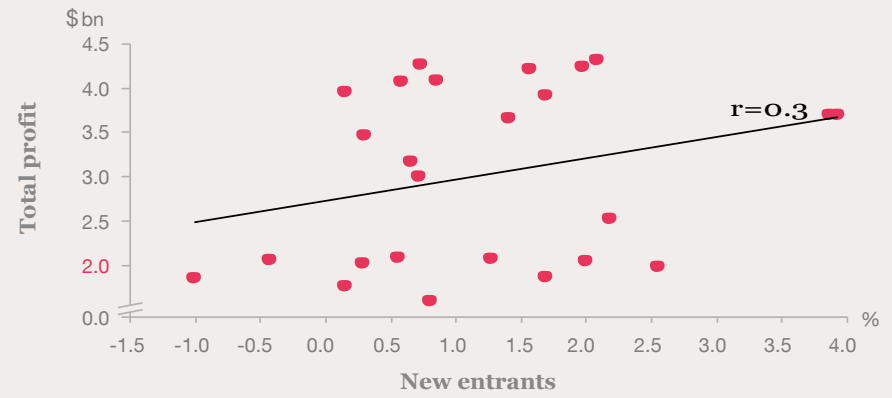
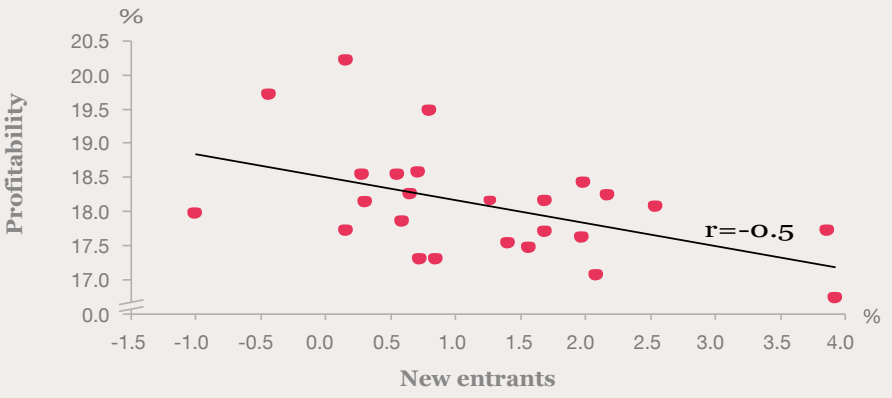


Figure 14 Relationship between new entrants and industry profitability



6 PwC, Global Digital IQ Survey, 2015, p. 10.

While it may be too soon to answer that question empirically, we know that the right strategy and investment decisions can help incumbents retain their leadership positions even in the face of disruption. However, that is easier said than done. The rapid pace of technological change highlights the fragility of incumbents' position in the face of disruption – they may just as easily face dwindling profit margins and loss of market share to new entrants. CEOs worldwide recognise the challenges that technology is creating. The results of PwC's 21st CEO survey revealed a similar perspective – one of the most important business threats in the minds of CEOs is the speed of technological change that their industries are facing (38% of CEOs surveyed were 'extremely concerned' by this). Businesses will need to realign their strategies and refocus on the things that matter. Here are some things that businesses should carefully keep track of.

Maintain a laser focus on technology developments

In separate research, we found that companies which are technology leaders in their industries are twice as likely to achieve rapid revenue and profit growth as laggards[6]. Much of the gain for such leaders originates in eight essential emerging technologies – artificial intelligence (AI), augmented reality (AR), blockchain, drones, the internet of things (IoT), robots, virtual reality (VR) and 3D printing. In the fast-changing world of digitisation, incumbents from any and all industries will need to retain their position as technology leaders if they are to preserve and expand their market presence.

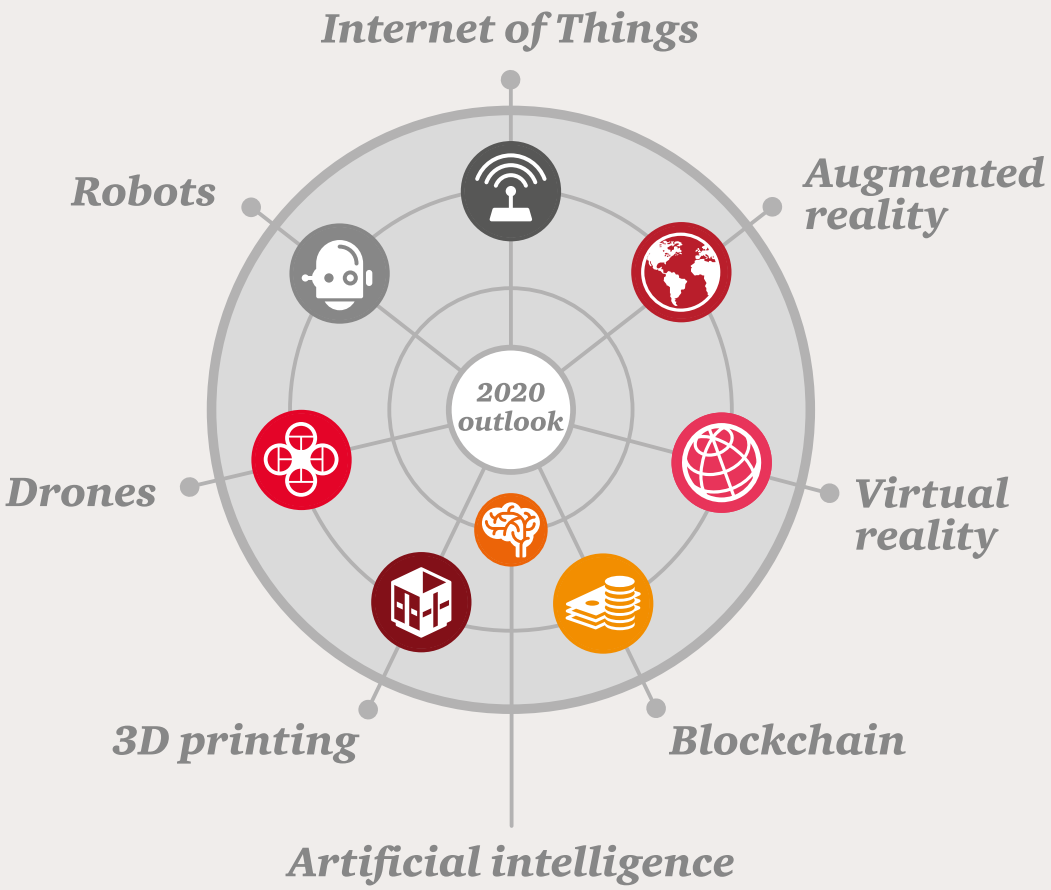
Identify expansion approach

Taking on industry convergence will involve more than just staying ahead on technology. Incumbents will need to devise strategies to expand their value propositions while keeping their core strengths at the centre of these strategies. No single approach will prove effective in the age of constant disruption. A range of strategies have worked, and will continue to work, for incumbents, however. These strategies include expanding applications of the core technology or product (when technology is at the centre of the expansion strategy), focusing on seamless customer experience by integrating vertically (when the acquired customer base is at the centre of expansion strategy) or developing new business models while retaining industry focus.

Identify collaborators among competitors

Incumbents will need to identify opportunities to convert disruptors into collaborators when assessing partnership and joint venture opportunities. Within their core industries, incumbents will need to consider the potential to develop communities of shared interest with competitors. Such initiatives would strengthen the readiness of the industry for the new industry world.

Figure 13 Essential Eight technologies



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