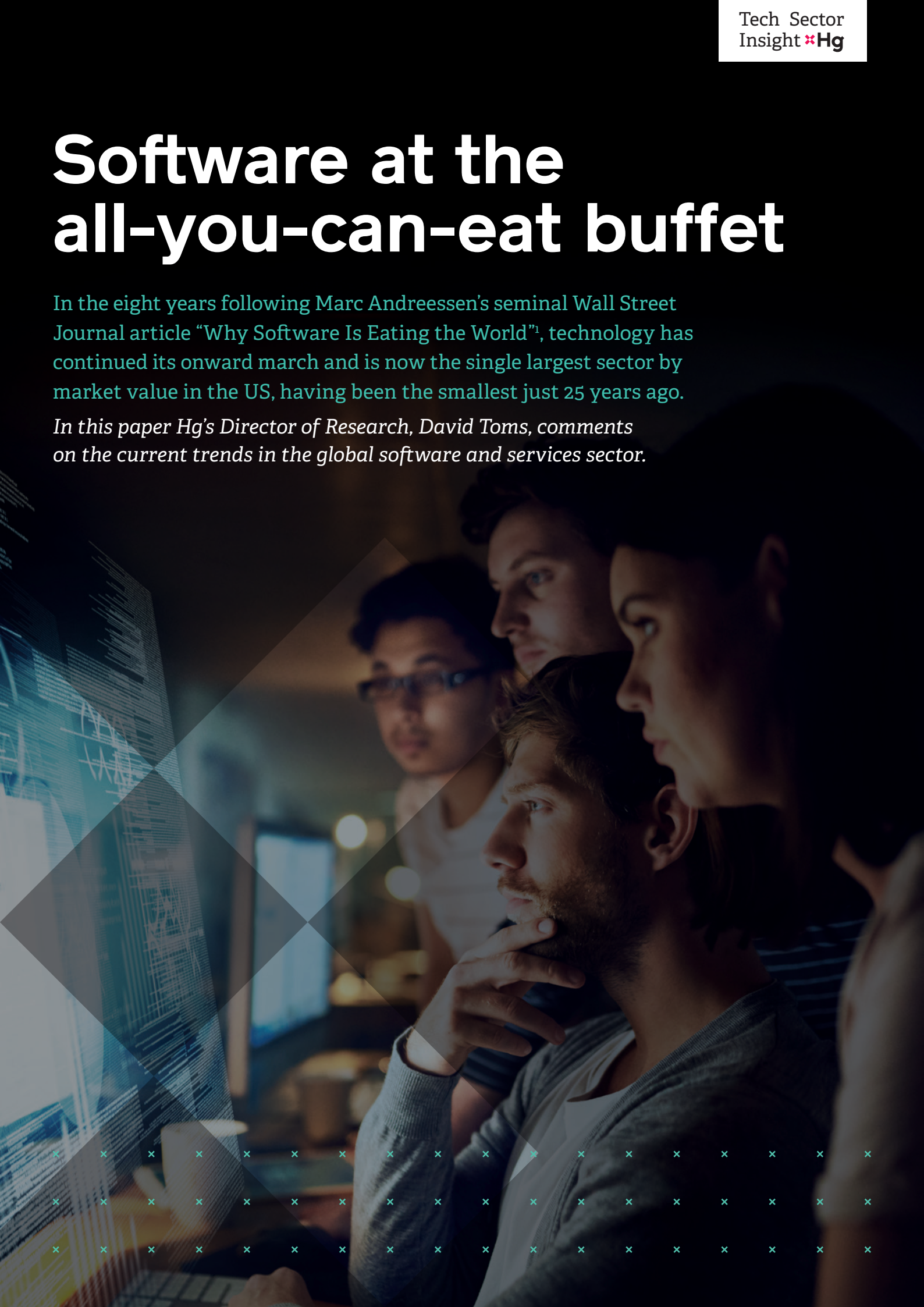
Software at the all-you-can-eat buffet

In the eight years following Marc Andreessen's seminal Wall Street Journal article "Why Software Is Eating the World"[1], technology has continued its onward march and is now the single largest sector by market value in the US, having been the smallest just 25 years ago.

In this paper Hg's Director of Research, David Toms, comments on the current trends in the global software and services sector.



“At the all-you-can-eat buffet of software opportunity, we are still on the first course”

by David Toms,
Director of Research at Hg

After such a strong run for the technology industry and its investors, why are we still so excited about the opportunity for software and services?

At Hg, we see generationally sustained secular trends, driving and shaping technology spend and the accompanying investment landscape. In particular we observe four important trends:

1. Rising labour costs driving accelerating software and services spend and specialisation;
2. Hardware productivity growth (Moore’s Law[2]) releasing spend for software and services;
3. Cloud reducing friction, accelerating growth, and moving spend to software;
4. “Private for longer” trend compounding growth of the opportunity pool.

Find more tech insights from David Toms and the Hg team in the Hg Monthly Newsletter. Subscribe by emailing marketingteam@hgcapital.com

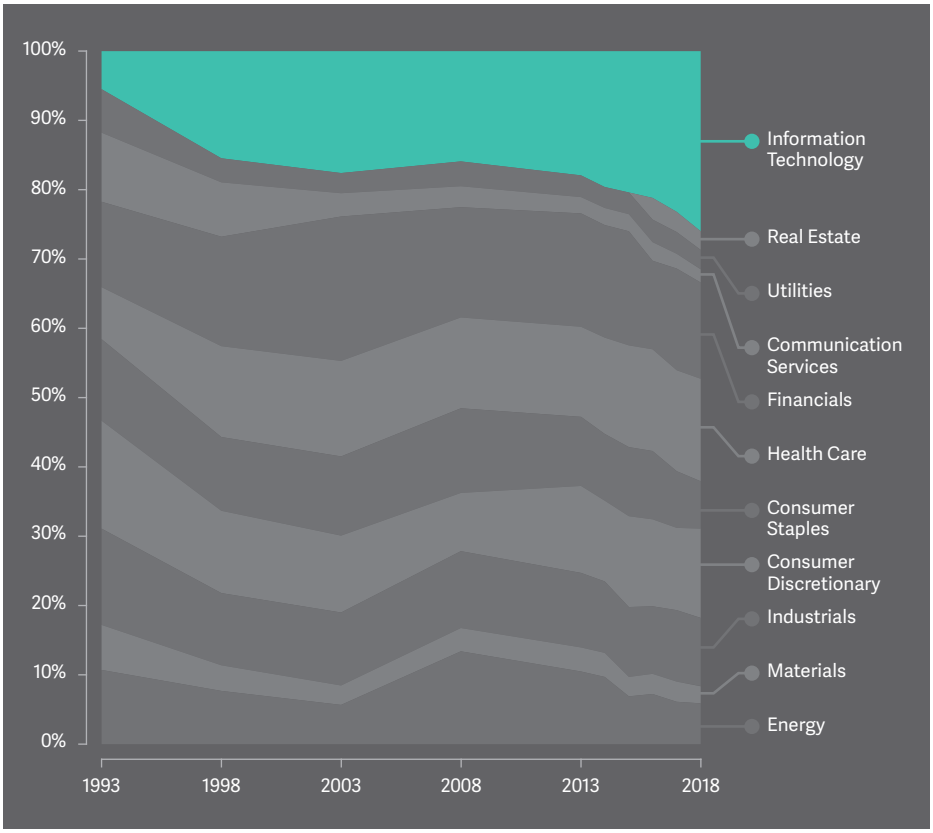
[1] *https://www.wsj.com/articles/SB10001424053111903480904576512250915629460 and https://a16z.com/2011/08/20/why-software-is-eating-the-world/*

[2] *https://www.intel.co.uk/content/www/uk/en/silicon-innovations/moores-law-technology.html “From careful observation of an emerging trend, Moore extrapolated that computing would dramatically increase in power, and decrease in relative cost, at an exponential pace”. Specifically, Moore’s Law in its most recent form states that the number of transistors on an affordable CPU would double every two years – simplified, this implies broadly a doubling of computer power every two years at a given price point. See also www.mooreslaw.org*

Figure 1:

Evolution of the main S&P500 sectors, 1993-2018

Source: Siblis Research; siblisresearch.com.



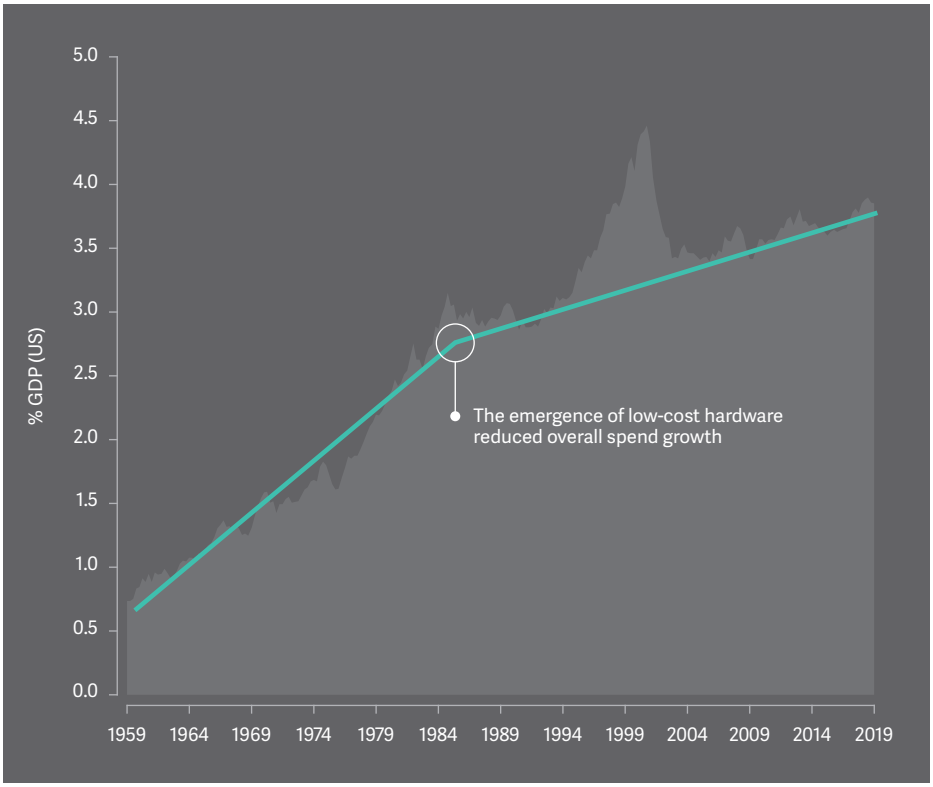
This growth in investment opportunity reflects the growth of the end market, as IT spending has been on a 'bottom left to top right' trajectory for over six decades now.

Despite significant growth, global IT investment today accounts for under 3% of GDP, albeit with some advanced economies closer to 4%. To put this in a broader context, worldwide labour costs account for c.50% of GDP.

Figure 2:

US IT capital investment as a % of GDP, 1959-2019

Source: Hg, analysis based on data from St Louis Federal Reserve.

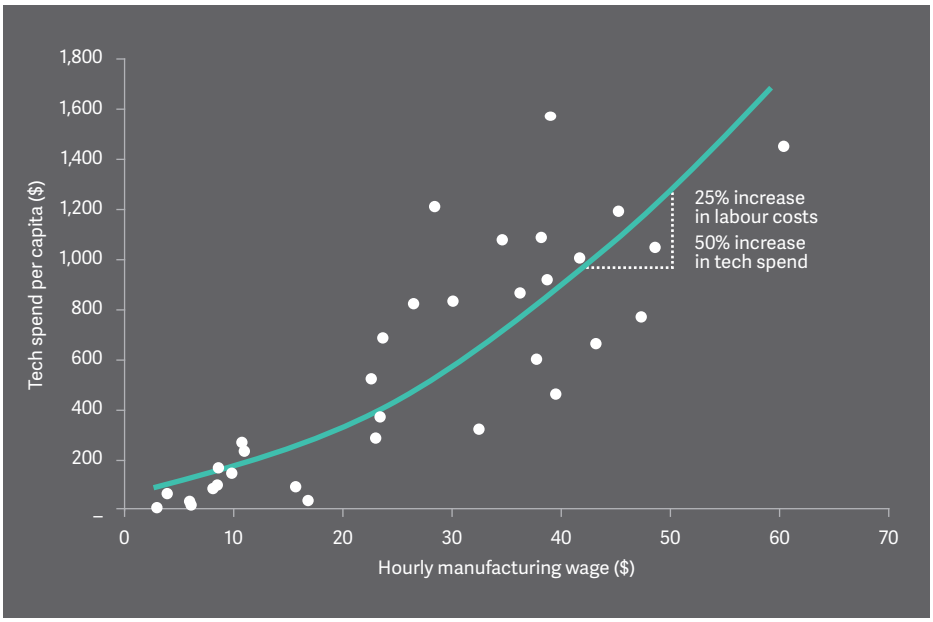


1 Rising labour costs drive software and services spend

Economic development drives broad increases in labour costs, which in turn drive increased use of IT. In figure 3, we show the correlation between fully costed hourly manufacturing wages and software and services spend across a number of global economies[3].

Figure 3:
Impact of labour cost on IT spend

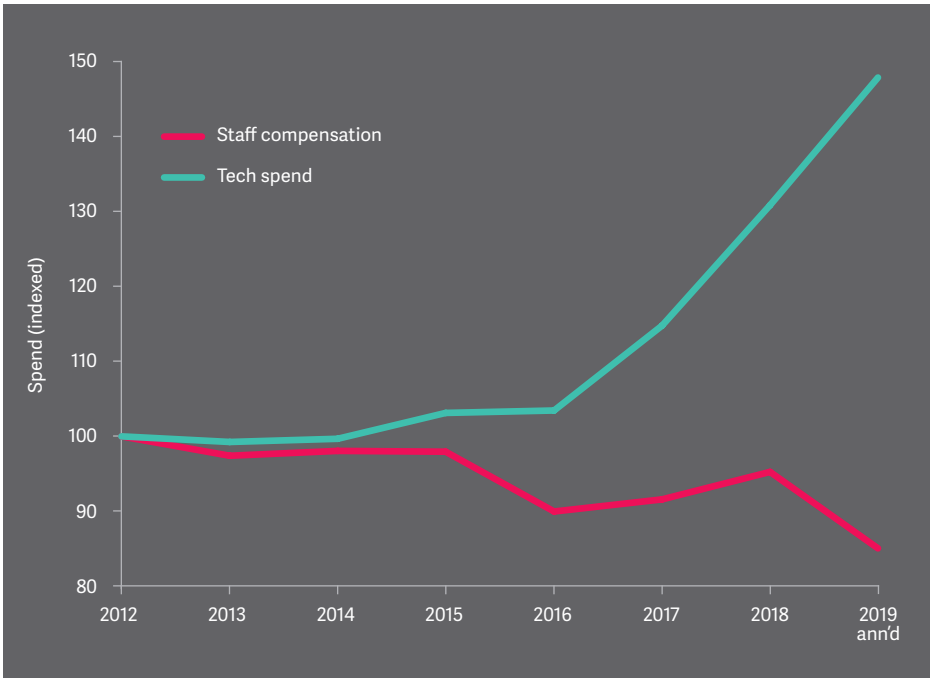
Source: Hg analysis based on data from Conference Board, Gartner Group and the World Bank.



This is further exemplified by one of the more extreme labour cost environments – the investment banking industry. Over the past five years, Goldman Sachs has seen a 13% fall in expenditure on staff, and a 48% increase in technology spend, highlighting the potential relative attractiveness of incremental spend in these areas.

Figure 4:
Goldman Sachs staff vs technology spend (indexed)

Source: Goldman Sachs earnings reports, 2014-2019.



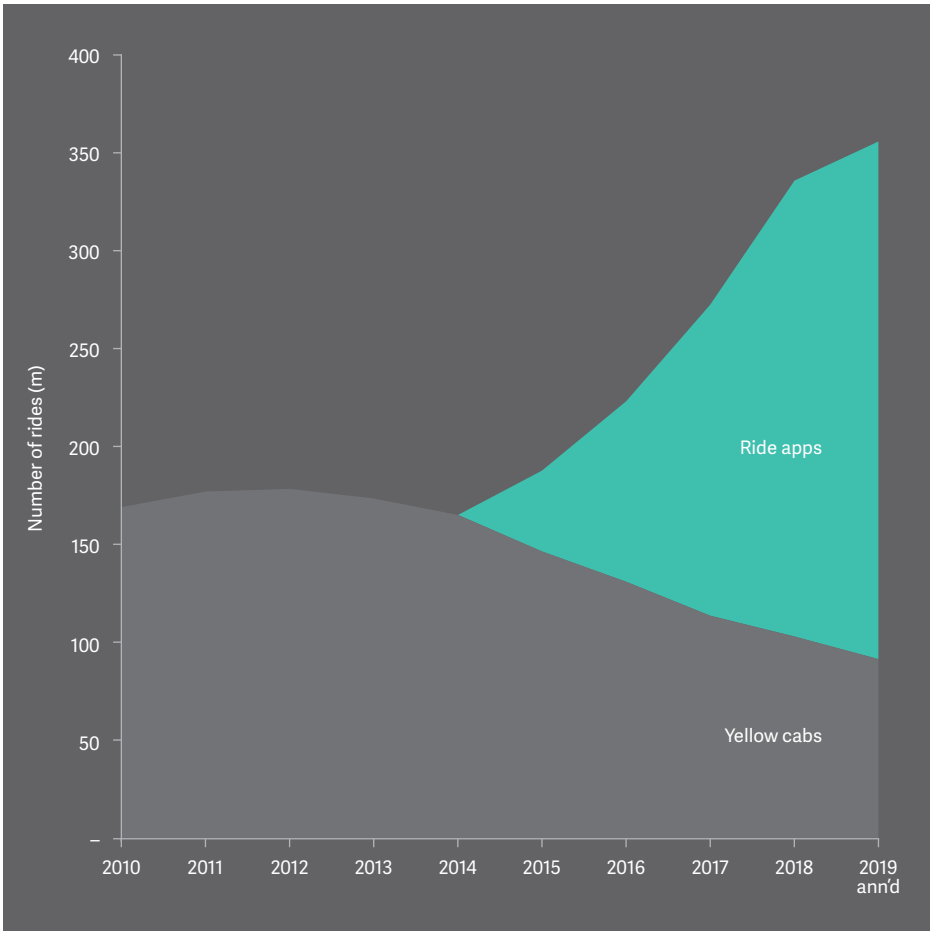
[3] *Defined as software and IT services spend, using figures from multiple sources including Gartner Group and IDC.*

However, whilst it would be easy to link the impact of technology exclusively to white-collar, desk-bound administrative jobs, the effects have been much broader and can materially expand existing markets. For example, software-based ride sharing has opened out the provision of transportation services to a wide range of individual providers, transforming the previously stagnant market for paid-for rides in New York.

Figure 5:

Impact of ride hailing apps (Uber & Lyft) on journeys in NYC

Source: Hg analysis of NYC Taxi and Limousine Commission data.



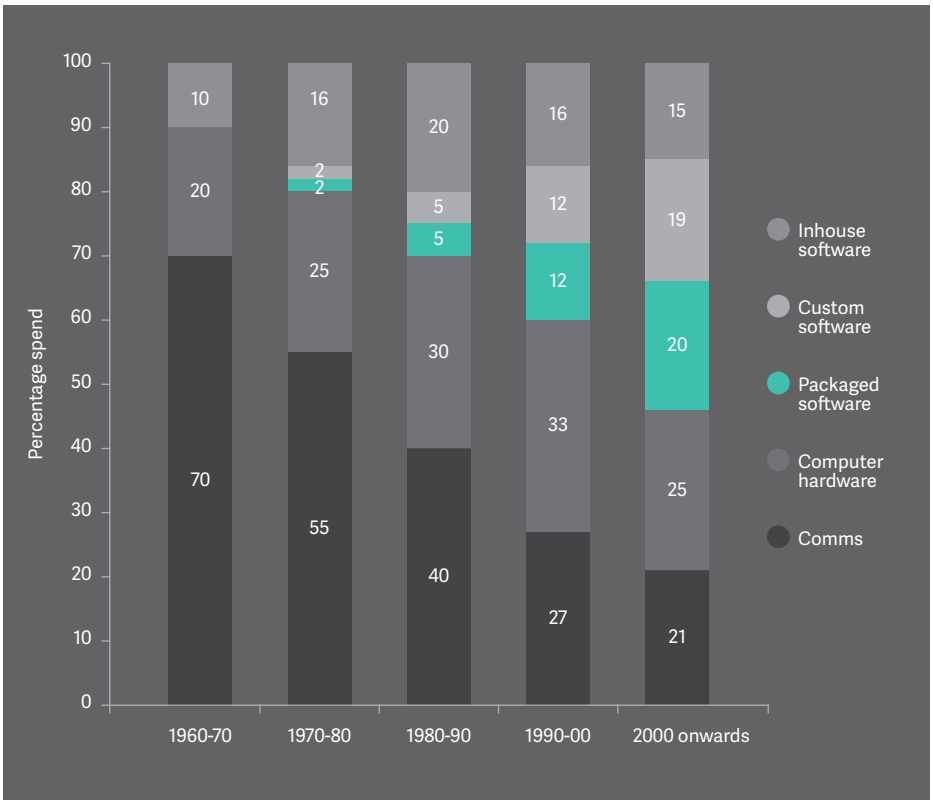
2 Hardware productivity catalyses greater software spend

The nature of overall technology spend is evolving even faster than it is increasing. Over the past 60 years in the US, hardware and communications combined have dropped from 90% of corporate IT investment spending to just 50%, compensated by software growing from 10% to 50%.

Figure 6:
Long-term shifts in US ICT spending patterns

Source: Hg analysis based on http://www.worldklems.net/conferences/worldklems2016/WorldKLEMS2016_Corrado.pdf.

Note that this differs from the GDP data presented below due to use of total spend figures, whereas GDP data relates to capital investment only, thus it is likely to omit inhouse and some custom software costs.



90% to 50%

Decrease in hardware and comms investment spending over last 60 years

10% to 50%

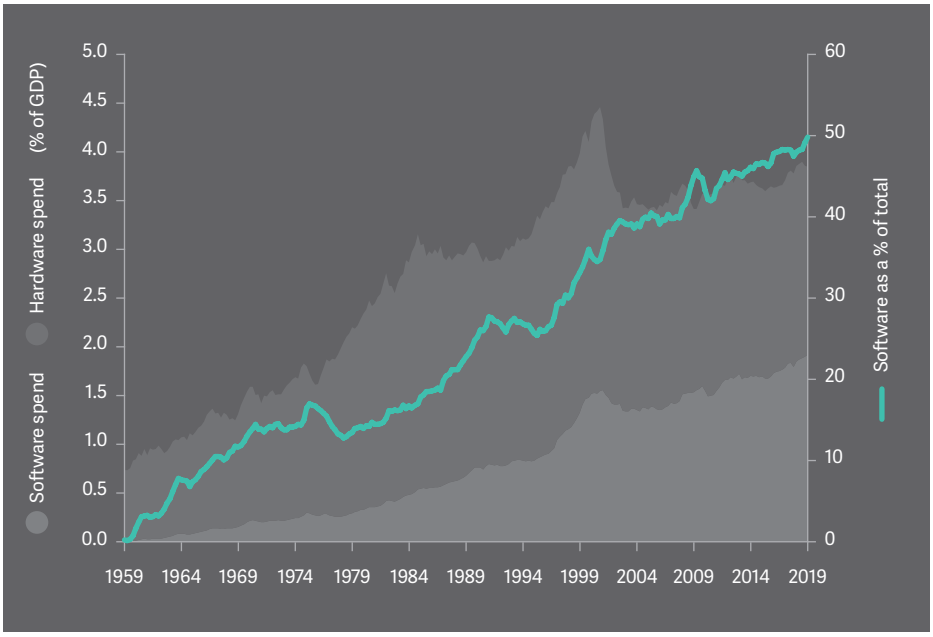
Increase in software investment spending over the last 60 years

Furthermore, within software, spending has shifted from inhouse to third party suppliers – either custom (e.g. IT services providers such as Accenture or CGEY) or packaged software (e.g. Microsoft or SAP). If you consider your own company's IT environment, 20 years ago this was likely to involve customised software for functions such as HR and CRM, written and supported by third parties, or possibly by an inhouse "guru" whose eventual departure sat high on every risk assessment. It is hard to conceive of a company voluntarily developing general purpose software inhouse today (indeed, we have even seen it investigated as an audit risk in public companies) – instead "standard" platforms such as SAP and Salesforce.com provide configurability for thousands of unique use cases from a single platform.

More evidence for the scale of this shift can be seen in figure 7 below. As a percentage of US GDP, hardware spend structurally peaked in 1984; the subsequent increase in tech investment has been entirely driven by software growth. As we show in section 3, we see this trend as further underpinned by the shift to cloud computing, increasing the available pool of "software capital" as "hardware capital" grows in capability but declines in cost.

Figure 7:
US software and hardware spend as a % of GDP, and software as a % of both combined

Source: Hg analysis based on data from St Louis Federal Reserve.



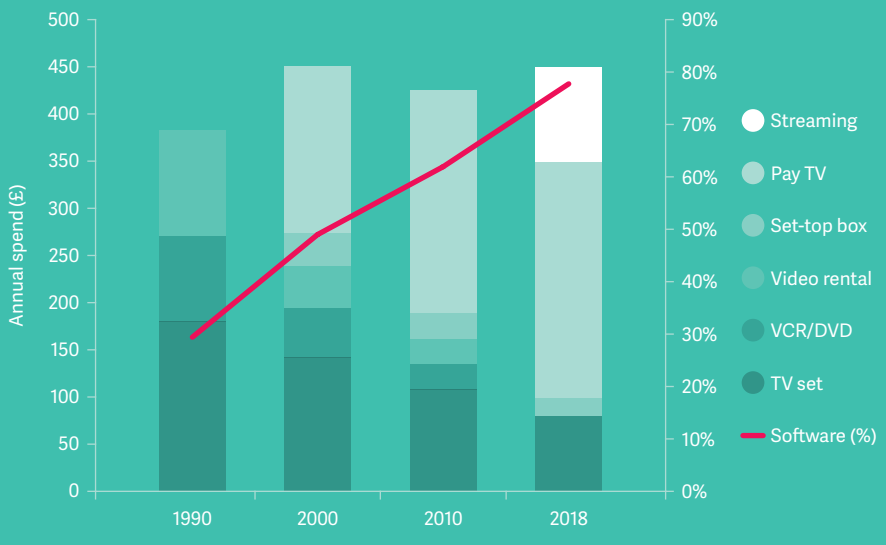
Bringing it home – Entertainment AV vs Enterprise IT in the UK

The evolution of the home entertainment market is, in many ways, analogous to the shift of enterprise IT spend towards software. In 1990, most of the cost of watching a movie at home lay in purchasing the hardware - the TV and VCR. In real terms, these prices have declined substantially (indeed, adjusting for "feature improvement", the decline is far sharper than shown).

More importantly, hardware ubiquity has led to an explosion in available "software", or, in this case, media content, and a shift in spend towards this component. Today, a year's subscription to Sky and Netflix is of similar cost to a typical TV set.

Figure 8:
Domestic TV as a proxy for Enterprise IT

Source: Hg analysis, illustrative, assume five-year depreciation of hardware, based on data from Ofcom, Sky, http://www.tvhistory.tv/tv-prices.htm, https://pdfs.semanticscholar.org/67e2/e2b576471311aec0ba58f7a339165709d8b5.pdf and other internet sources.

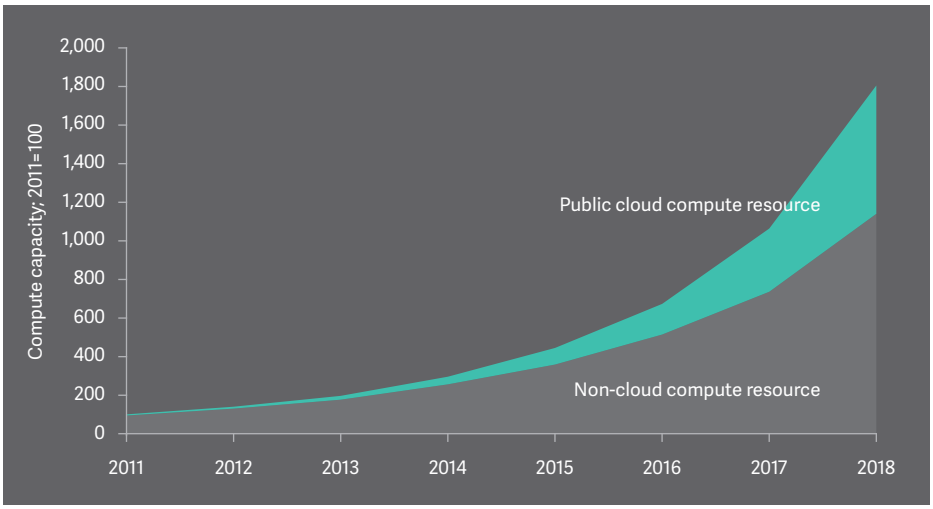


3 Cloud reduces friction, accelerates growth, and moves spend to software

This shift continues with cloud computing (i.e. the remote delivery of computing capability). Our estimates suggest that, in substantially less than a decade, "global installed compute capacity" has, very approximately, risen twentyfold. A combination of: modestly increased spend growing the base of installed servers; Moore's Law driving around a tenfold increase in their capability; and, the greater efficiency of servers deployed in public cloud environments[4] have all combined to drive this material increase in capacity.

Figure 9:
Estimated global compute capacity (Indexed)

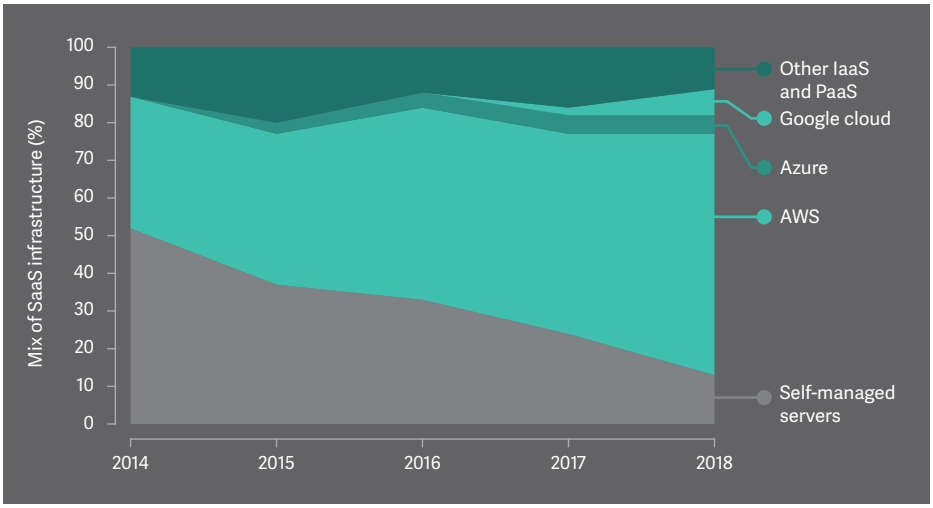
Source: Hg analysis based on IDC server sales figures, Moore's Law 1.4x annual multiplier and 3x cloud efficiency multiplier.



Additionally, if we look at the choice of infrastructure platform used by software vendors for delivery of Software-as-a-Service (SaaS), there is a clear trend away from self-management of infrastructure.

Figure 10:
SaaS application delivery trends since 2014

Source: https://www.forentrepreneurs.com/2018-private-saas-company-survey-part-2/, n>200 for each year.



From an infrastructure perspective, "cloud" potentially covers much more than a basic Infrastructure-as-a-Service (IaaS) proposition, and a much broader range of providers than the big name "hyperscalers" such as AWS and Azure. There are many components of IT that may be the responsibility of the customer or third-party providers, and where these are provided externally, there can also be multiple layers of provision. As a result, growth in cloud delivery models catalyses a whole range of associated components of online service provision.

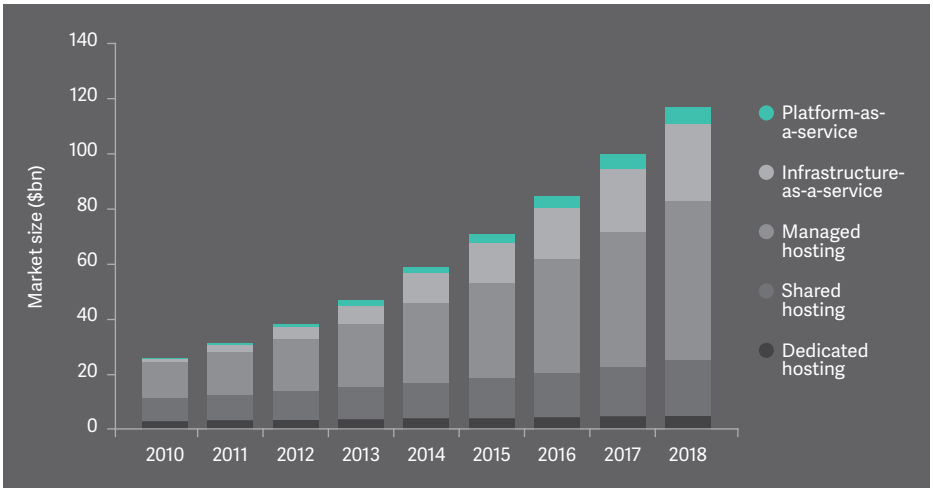
[4] *https://aws.amazon.com/blogs/aws/cloud-computing-server-utilization-the-environment/*

Figure 11 shows data from 451 Research demonstrating growth across a range of service delivery models that may be involved. In particular, this highlights the growth in managed hosting resulting, in our view, from the growing complexity of service provision, and the desire of companies (particularly SMBs) to outsource this to specialist providers.

Figure 11:

Worldwide hosting and cloud market size, 2010-2018

Source: 451 Research Market Monitor Cloud Computing, Q1 2019.



Our experience across multiple private investments, backed by considerable evidence from the public markets, is that the benefits of cloud computing go far beyond infrastructure. Remote delivery of software (SaaS) alleviates many of the traditional pain points of procurement, hardware configuration, software installation, patching, backing up, integrating and testing. Through reducing friction in these processes, SaaS increases the value to both customers and suppliers. There are also additional benefits – such as a dramatic reduction in piracy. For example, Autodesk reports 16 million users, of whom only 4 million are appropriately licensed. In a cloud world, the 12 million unlicensed users can be excluded from access to the product, enabling Autodesk to fully monetise its user base.

Figure 12:

Progression from on-premise to cloud/SaaS software delivery

Source: Hg analysis based on data from a range of companies including Sage, Autodesk, Intuit, Xero, Allocate Software, Visma, Iris and Access.

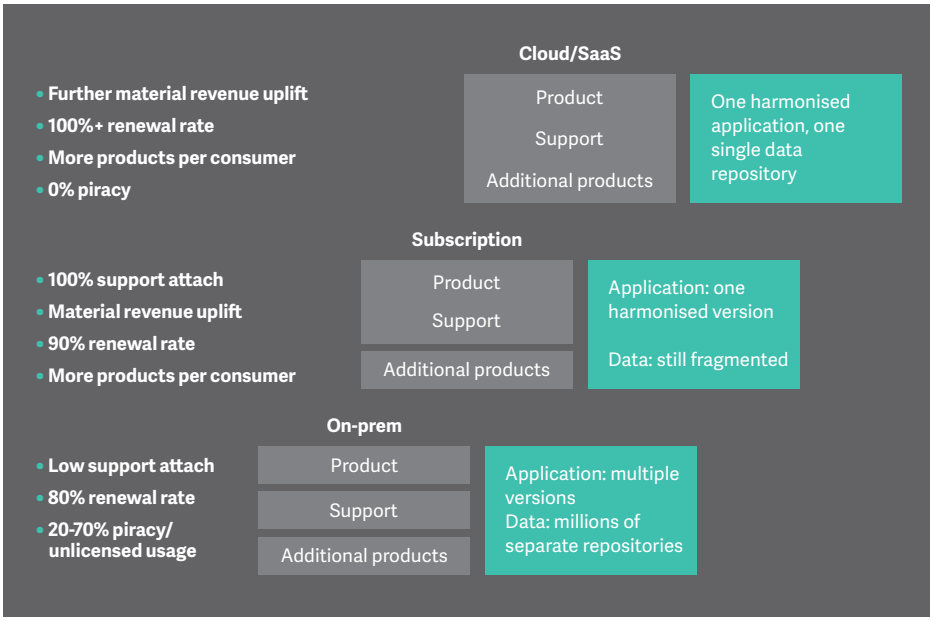


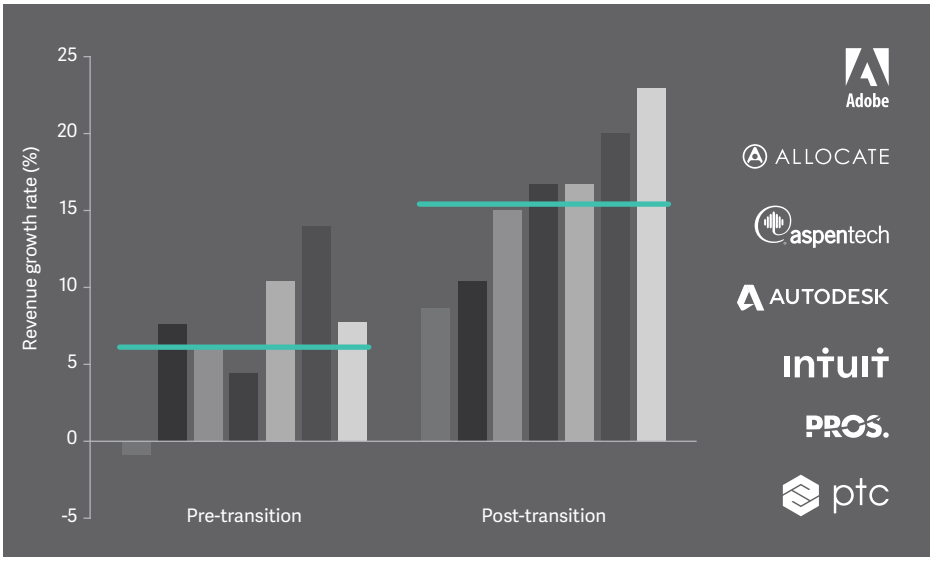
Figure 12 provides a high level summary of some detailed data we have from a range of public companies (including, for example, Sage, Sophos, Autodesk, Intuit and Xero) and some of our own Hg businesses, to highlight the benefits from migrating "up the stack". Starting with traditional on-prem software, we move through subscription pricing (frequently a first step in a cloud migration) to full cloud delivery.

Looking at a broad group of companies that have undergone all or part of this transition (figure 13), we see a consistent increase in growth rate – on average, an increase from 7% growth pre-transition to 16% post-transition, once all accounting artefacts have worked through.

Figure 13:

Pre/post subscription/SaaS-transition growth rates

Source: Hg analysis based on financial statements from Adobe, Aspentech, Autodesk, Allocate Software, Intuit, Pros and PTC.

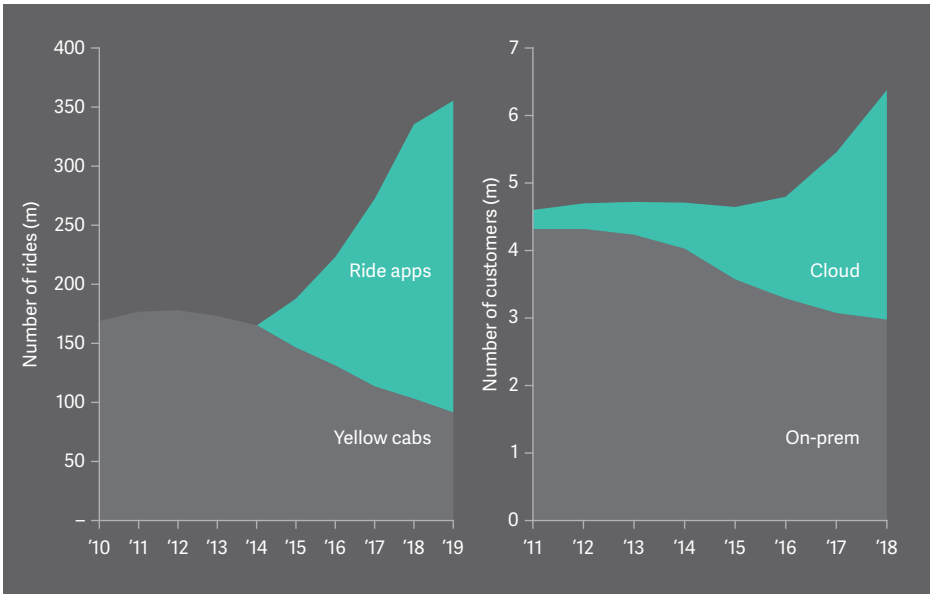


There is an interesting comparison to be drawn between the impact of ride hailing apps such as Uber, which have dramatically expanded the market for personal transportation services, and the impact of cloud accounting software which has similarly democratised the accounting software market. We show below a comparison between our previous graph of NYC transportation services and the evolution of Intuit's Quickbooks product. Both show the same clear trait that the growth from the "new" goes far beyond mere cannibalisation of the "old".

Figure 14:

Usage of ride apps vs usage of SMB cloud accounting software

Source: Hg analysis of NYC Taxi and Limousine Commission data, Hg analysis of Intuit company filings.



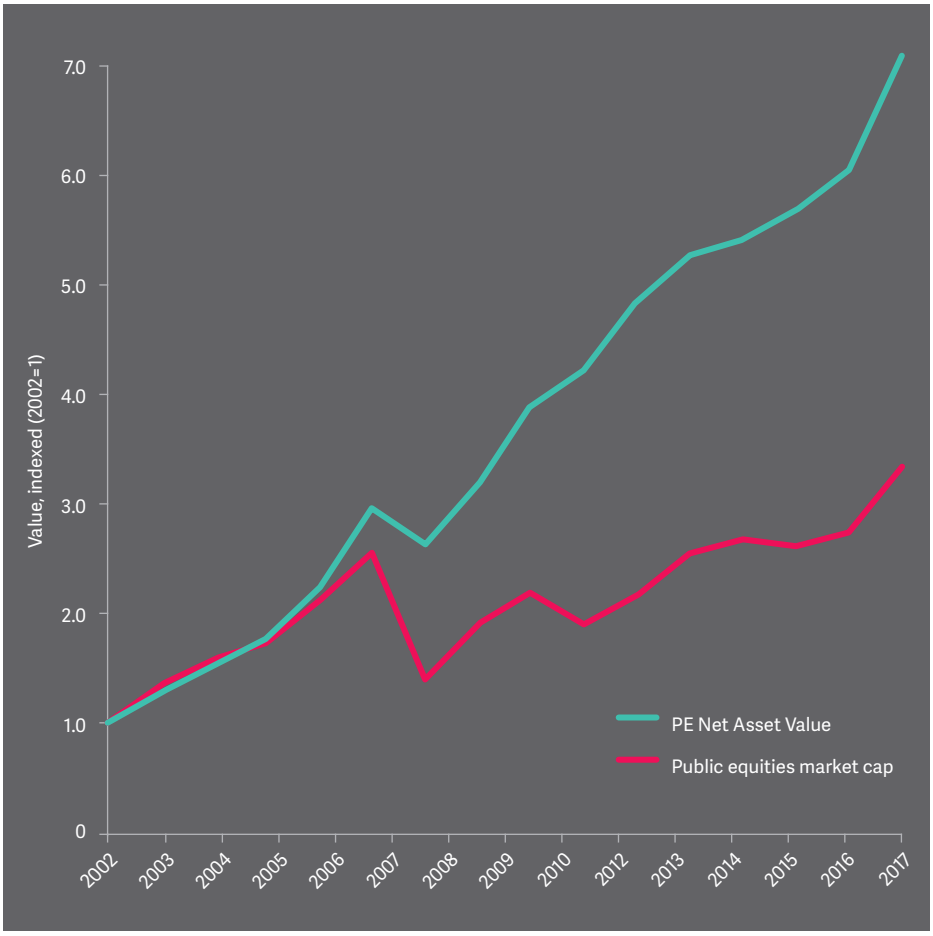
At Hg we see these same patterns in our portfolio. For example, when, back in 2006, we financed the management of Visma to take the business private, part of the plan even at that early stage was to position the business to take advantage of cloud computing. Over the following 13 years, we have supported Visma in over 150 M&A deals, as well as organic investment, which have underpinned 13 years of unbroken growth. Despite its now-vastly-greater scale, Visma's organic growth stands at record levels as high-growth cloud revenue streams dominate the mix.

4 "Private for longer" compounds growth of the opportunity pool

Strong secular growth as economies develop, a shift in value towards software and services, and a burgeoning opportunity set as a result of the cloud transition all fuel the end market, but how do these intersect with the Private Equity investment landscape? A key emergent theme in recent years has been "private for longer" – as a result of this, combined with capital inflows and asset growth, since 2002 the Net Asset Value (NAV) in Private Equity has increased 7.5x, vs 3.5x for the market cap of public equities.

Figure 15:
Global PE Net Asset Value and public equities market capitalisation 2002-17, indexed to 2002

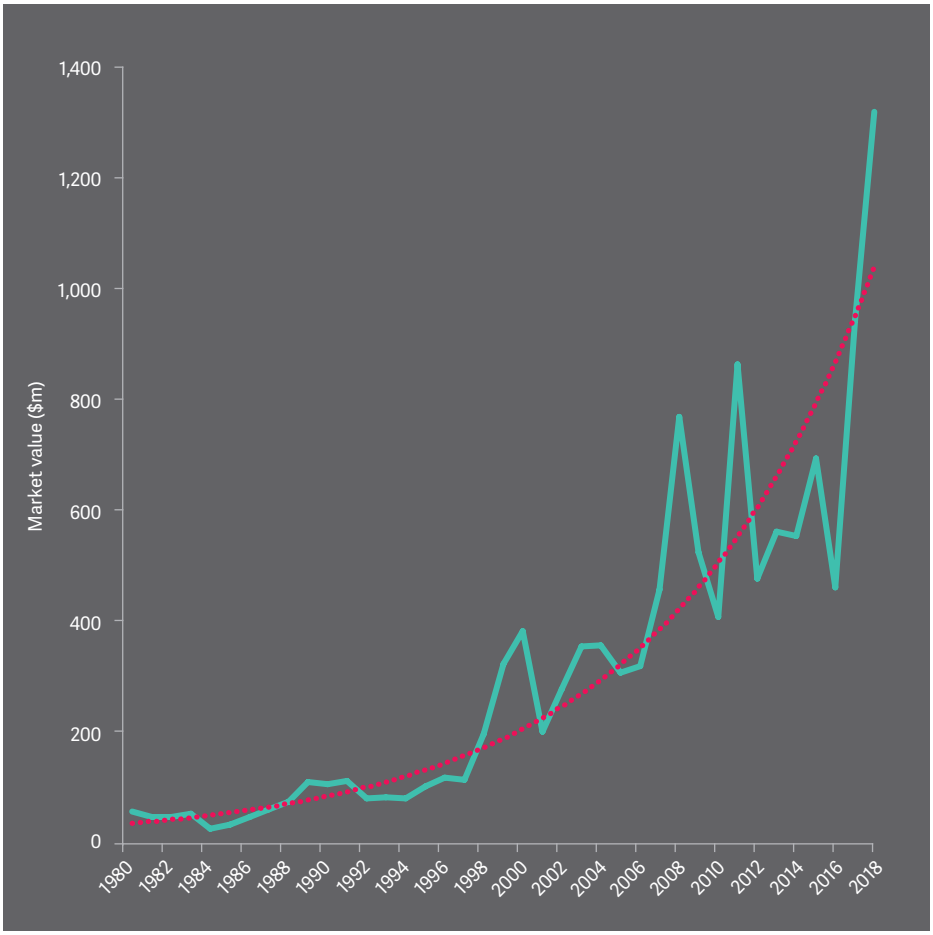
Source: McKinsey Global Private Markets review, 2019 https://tinyurl.com/McKinsey-PE-2019



A consequence of this has been that private companies are more mature and larger – the chart on the next page shows the median value of a private company at IPO over the past 40 years. In the 80s and 90s, companies that reached a value of around $100 million would IPO, thus private investment was limited to early stage/venture funding and founder buyouts. From the late 90s onwards, mid-market investment provided private capital that alleviated the need to IPO, thus companies would grow to c.$500 million in the private world. More recently, ongoing expansion of private capital has enabled companies to stay private whilst valued comfortably in excess of $1 billion. However, to set the private/public context, our very approximate estimates are that there is less than $1 trillion of enterprise value in private tech companies, vs over $10 trillion in public tech companies; the pendulum has only just started its swing.

Figure 16:
Median market value of tech IPOs by year, $m

Source: Jay R. Ritter, Cordell Professor of Finance, University of Florida. https://site.warrington.ufl.edu/ritter/files/2019/01/IPOs2018Statistics_Dec.pdf



Reasons for this shift vary, but our conversations in the industry suggest that key "pull" factors are greater availability and liquidity of private capital, the attraction of operating in a close-knit private ecosystem, and an opportunity to operate on a multi-year planning cycle rather than hitting quarterly guidance. These are supplemented by "push" factors away from the public markets, such as increasing regulatory overheads, a growing misalignment between public investors and their governance teams, and the sometimes-volatile nature of public market investment strategies (in particular, the growing impact of index and quantitative investing).

Conclusions

At the all-you-can-eat buffet of software opportunity, we are still on the first course. Our undiminished excitement for the investment road ahead is supported by strong evidence for the scale of opportunity, fuelled by economic development, and catalysed by growth in hardware capacity. Cloud technologies ease the sales and implementation process further, with lower friction benefiting both customers and vendors. Finally, from a PE perspective, the growing relative attractiveness of private markets helps drive these investment opportunities in our direction, at valuations that are consistent with the broader market.

For more information about this research and to speak with David Toms, please email info@hgcapital.com

About David Toms

David is Director of Research at Hg, leveraging over two decades of technology sector experience to provide broad market context to Hg's deep cluster knowledge, researching how market trends and data impact new investment opportunities, existing portfolio companies, and potential exits.

David joined in 2018, after nearly 20 years in the public markets. Prior to Hg, he was Director of Technology Research at Numis, following the full size range of UK-listed public Software/IT services companies where he and his team were top-ranked for over a decade by investors and companies in the industry-wide Extel surveys.

David holds an MA in Natural Sciences from the University of Cambridge.

About Hg

Hg is a specialist private equity investor, committed to building businesses that change the way we all do business, through deep sector specialisation and dedicated operational support.

We are a leading European investor in software and services businesses, with increasing global presence, having built a team of 170 people over 25 years.

Hg partners with the businesses and management teams we invest in. We have 35 operational professionals providing practical support to management teams to help them realise their growth ambitions. We share best-practice 'playbooks' and leverage Hg's executive and portfolio network as a powerful tool for knowledge sharing across comparable businesses.

Based in London, Munich and New York, Hg has funds under management of around $13 billion serving some of the world's leading institutional and private investors. For further details, please see www.hgcapital.com.

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