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Can AI save high-labour firms?

Luke Templeman, CPA
Research Analyst
+44-20-754-10130

Olga Cotaga
Research Analyst
+44-20-754-15910

Companies with a large number of employees have a big problem. Quite simply, they fail to extract as much value from each staff member as do low-staff firms. Indeed, labour-intense firms tend to have a lower market cap, thinner margins, and lower growth rates.

AI may be the way forward. In this piece, we argue that AI will make workers more productive, particularly in high-staff firms. The reason is that the profitability of high-staff firms has the highest leverage to the performance of their labour force. AI will help upskill them and streamline repetitive and mundane tasks that are more prevalent in high-staff companies.

Taking this one step further, we calculate the effect on 'Return on Equity' and 'Human Capital Return on Investment' for groups of low-staff and high-staff companies. We show that the financial benefits of a more productive workforce are much greater for high-staff companies.

Finally, given that the benefits of AI may accrue most significantly to companies that have been underperformers, the technology may be the catalyst that gives equity markets a boost this decade. The catalyst in the 1980s was deregulation, and in the 1990s it was perestroika and the emergence of China. In the 2000s it was the tech boom, and in the 2010s it was quantitative easing. So far, there is no clear catalyst for the 2020s. It could be that AI-based labour productivity is the shot in the arm that corporates and equity markets need.

This piece is part of an ongoing series this week looking more deeply into the topic.

See also:

Thematic Research: Generative AI represents a turning point for humanity – for better and for worse (David Folkerts-Landau)

Thematic Research: History suggests AI will ultimately create not destroy jobs (Jim Reid and Henry Allen)

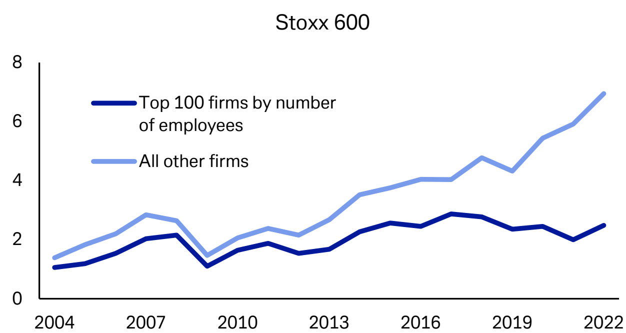
Thematic Research: Generative AI and ChatGPT 101 (Adrian Cox, Jim Reid and Galina Pozdnyakova)

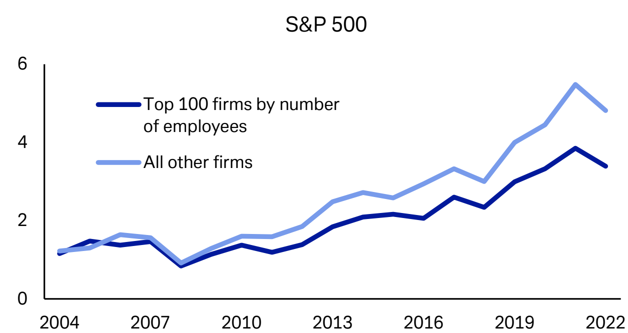
How high-staff firms underperform

There is some irony to the fact that companies have spent the last two years scrambling to hire staff. After all, the evidence shows that having more staff can be counterproductive and that high-labour firms can underperform their slimmer competitors.

In both Europe and the US, companies that have built themselves into having the largest workforces today have seen their market value underperform.

Figure 1: Median market capitalisation (indexed to 2003)

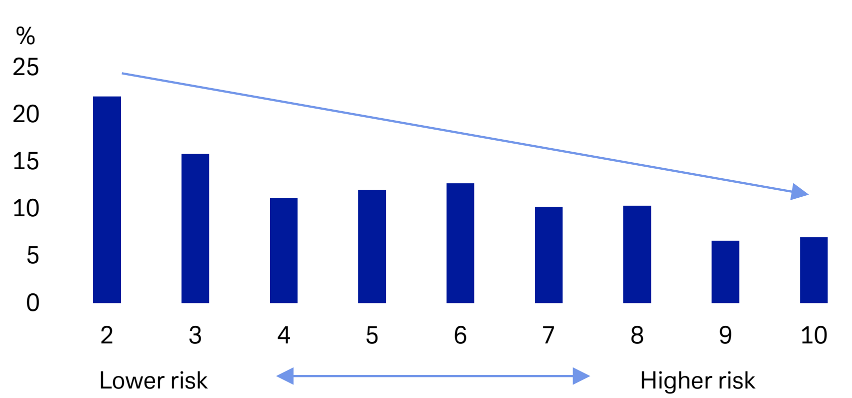




Source : Factset, Deutsche Bank

Firms with larger workforces also tend to have lower profit margins. That can be seen in the following chart which separates companies into buckets based on their "Labour Management Exposure Risk". Companies in the buckets on the left hand side tend to carry a lower risk than firms in the buckets on the right hand side. The risks overall tend to be associated with higher wage costs and a greater exposure to unions and industrial activity, which high-staff firms encounter more often. And as seen in the chart, margins tend to fall as risk increases.

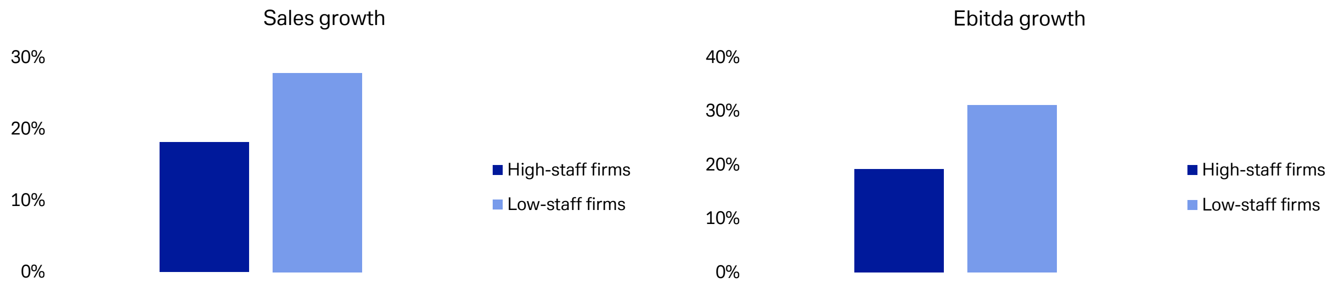
Figure 2: Median net income margin by "Labour Management Exposure Risk" group - MSCI US



Source : MSCI, Factset, Deutsche Bank

Covid has made things worse. The following charts show that last year high-staff firms in the US have seen much lower growth than their lower-staff counterparts when compared with three years ago.

Figure 3: Median % change in growth proxies 2022 v 2019 - S&P 500



We define high number of employees any number above the 75th percentile

We define high number of employees any number above the 75th percentile

Source : Factset, Deutsche Bank

The business challenges of managing large numbers of staff are as varied as they are well studied. They include the disconnect between founders or managers and workers as a company grows. Large-staff companies can also attract more transient workers with varied motivations. That can make for lower marginal returns than those achieved by companies where a small number of people work closely together with a shared motivation and goal.

AI can be the ‘underperformance’ pill

It is easy to argue that AI can help high-labour firms by finding efficiencies that end people’s jobs. We do not believe this will be the case in anything beyond niche situations. Rather, we can see a world where AI works with people to cut out mundane parts of their job, allows them to be more productive and levels up their skill sets.

These benefits are particularly important for high-staff firms given they tend to have a wide range of junior and senior staff and so the need to upskill workers is more acute. Indeed, one study[1] showed that ChatGPT “substantially” raises average productivity, particularly for junior staff. To quantify, it reduced the time taken to complete a task by 0.8 standard deviations. At the same time, the quality of output rose by 0.4 standard deviations. Effectively, ChatGPT compresses the productivity distribution and benefits junior workers more. There are also benefits for more senior workers. The same study showed that ChatGPT allowed them to maintain their quality standards while making them “significantly” faster.

Another example is the GitHub Copilot, an AI-based coding tool. In a survey of more than 2,000 developers, 88 per cent said they were more productive using the tool. The reason was clear. A full 74 per cent said the tool allowed them to focus on more satisfying work, whilst 96 per cent answered they were faster with repetitive tasks.

Most occupations are likely to be exposed to large language models (LLMs). The maker of ChatGPT has contributed to research[2] which showed that language models could have some effect on 80 per cent of the US workforce with 19 per cent “heavily” impacted. Higher-income positions are likely to be most affected by

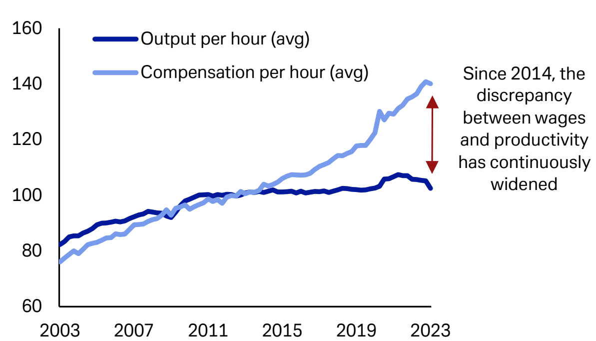
1 MIT, “Experimental Evidence on the Productivity Effects of Generative Artificial Intelligence”, March 2023
2 OpenAI, OpenResearch, University of Pennsylvania, “GPTs are GPTs: An Early Look at the Labor Market Impact Potential of Large Language Models,” March 2023

LLMs.

A productivity boost

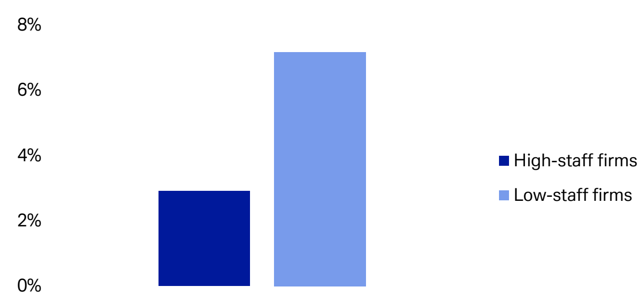
The developed world is in desperate need of a productivity boost. The left chart below shows the 'productivity gap' for the US. Meanwhile in Europe, average annual growth in labour productivity, measured as real GDP per hour worked, has continuously declined from about seven per cent in the 1960s to just one per cent since the early 2000s.[3] High-staff US companies are particularly in focus here as even during the short-lived growth in productivity during covid, their net income per employee did not increase as much as those firms with fewer employees, as seen in the chart below on the right hand side.

Figure 4: Productivity v Wages - US



Source : Factset, Deutsche Bank

Figure 5: Median % change in net income per employee, 2022 v 2019, S&P 500



We define high number of employees any number above the 75th percentile

Source : Factset, Deutsche Bank

High-staff firms have a proven record of enjoying the largest benefits from general purpose tech

AI is one of those rare 'General Purpose Technologies'. It does not do anything by itself, but rather it allows people to develop many things using it as a base. Other examples through history include the steam engine and electricity transmission.

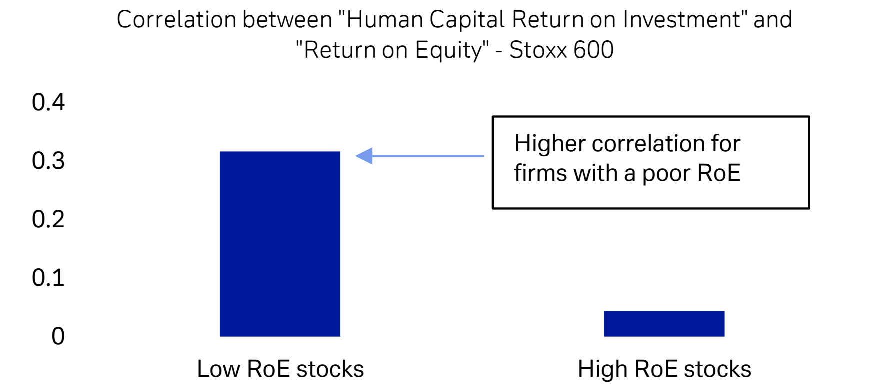
Large companies have been particularly good at harnessing general purpose tech. The adoption of the steam engine is one such example. One study[4] has shown that the likelihood of adopting steam increased in establishment size, as measured by employment or output. Most importantly, the adoption proved most impactful for companies with a bigger workforce. Indeed, after controlling for capital intensity, steam powered 'factories' – considered large establishments, with 16 or more employees – had significantly higher total factor productivity than smaller establishments using steam.

3 ECB
4 NBER, "Steam power, establishment size, and labor productivity growth in nineteenth century American manufacturing", January 2006

Low-return companies rejoice!

Improving productivity with AI may benefit companies with the worst returns. We can estimate this through analysing "Human Capital Return on Investment". This calculates the profitability of a firm for a given level of labour cost. When we compared HCRoI with Return on Equity for European companies (which have better disclosure on staff costs than do US firms), we found a much stronger relationship for low-return companies. In other words, companies with low returns that improve their HCRoI get a much higher RoE boost than do high-return firms.

Figure 6: When a low-profitability firm improves its profit per employee, the gains to RoE are much higher than for already-strong firms

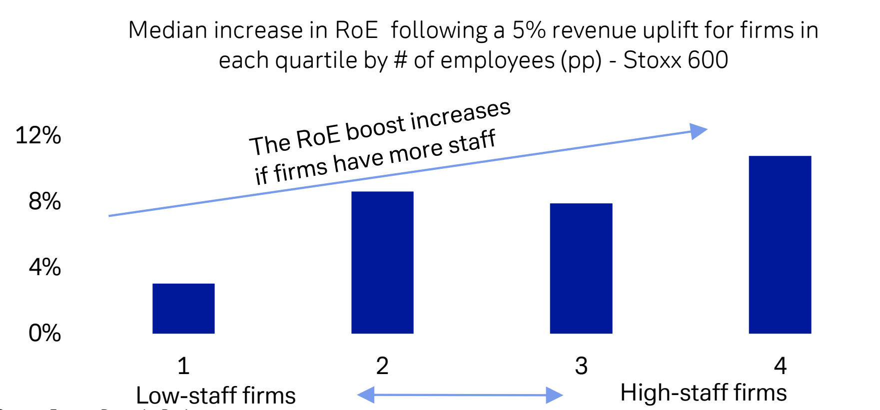


Source : Factset, Deutsche Bank

Higher returns if AI lifts labour productivity

What returns can high-staff companies expect from AI? First, we start with a blunt assumption – that AI could add five per cent to corporate revenues. It could be higher or lower but, in any case, the actual number is not relevant – what matters is the trend of the outcome. Next, we split European companies into four buckets based on the size of their labour force. Finally, we calculate the median Return on Equity for each of those buckets of companies both now and in the situation where AI increases their revenues. The outcome is shown on the following chart. Of course, there is a cost to AI adoption, however we assume that high-staff firms, which tend to be the largest, may be more able to take on these additional costs.

Figure 7: A greater number of staff gives greater potential for RoE gains



Source : Factset, Deutsche Bank

In short, the potential boost that AI may give high-staff companies is greater than it is for low-staff companies. Of course, this is another way of saying that high-staff companies simply have greater operational leverage (both up and down). But that is the exciting thing about AI. It has the potential to be an enabler of operating leverage. As companies with a lot of staff generally fall into this segment, they should be excited about the prospects of increasing staff productivity and, thus, making big gains via their operating leverage.

Our future labour force needs AI

What ChatGPT and its sister programmes can do is not new. Similar tech has been used by a variety of corporates and investment managers for years. The difference is that these companies worked hard to keep the tech to themselves as a source of competitive advantage. In contrast, ChatGPT has been released to all and is very user friendly. That makes it a great way to effectively upskill workers.

The productivity that will result is desperately needed given that corporate returns are under pressure from megatrends, such as the ageing population, deglobalisation, reshoring, the move from private to public power, and the tighter money supply. These trends tend to affect high-staff firms to a greater extent than low-staff firms.

That means AI could be the catalyst that not only saves high-staff corporates, and their investors, from an otherwise low-growth decade. But also, it could help spark new business models. Indeed, history shows we should expect this.

Just as it was difficult to see how the steam engine and electricity would eventually lead to the moon landing, it is hard to envision the type of corporate benefits that will be created by successive versions of AI. Most immediately, those benefits are likely to accrue to high-staff firms. And in that case, it may remove the irony of today’s staff-hungry firms underperforming their slimline peers.

Appendix 1

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It should be noted that the decision to incorporate ESG factors into any investment strategy may inhibit the ability to participate in certain investment opportunities that otherwise would be consistent with your investment objective and other principal investment strategies. The returns on a portfolio consisting primarily of sustainable investments may be lower or higher than portfolios where ESG factors, exclusions, or other sustainability issues are not considered, and the investment opportunities available to such portfolios may differ. Companies may not necessarily meet high performance standards on all aspects of ESG or sustainable investing issues; there is also no guarantee that any company will meet expectations in connection with corporate responsibility, sustainability, and/or impact performance.

David Folkerts-Landau

Group Chief Economist and Global Head of Research

Pam Finelli Global Chief Operating Officer Research	Steve Pollard Global Head of Company Research and Sales	Jim Reid Global Head of Macro and Thematic Research	Tim Rokossa Head of Germany Research
Gerry Gallagher Head of European Company Research	Matthew Barnard Head of Americas Company Research	Peter Milliken Head of APAC Company Research	Debbie Jones Global Head of Company Research ESG
Sameer Goel Global Head of EM & APAC Research	Francis Yared Global Head of Rates Research	George Saravelos Global Head of FX Research	Peter Hooper Vice-Chair of Research

International Production Locations

Deutsche Bank AG
Deutsche Bank Place
Level 16
Corner of Hunter & Phillip Streets
Sydney, NSW 2000
Australia
Tel: (61) 2 8258 1234

Deutsche Bank AG
Equity Research
Mainzer Landstrasse 11-17
60329 Frankfurt am Main
Germany
Tel: (49) 69 910 00

Deutsche Bank AG
Filiale Hongkong
International Commerce Centre,
1 Austin Road West,Kowloon,
Hong Kong
Tel: (852) 2203 8888

Deutsche Securities Inc.
2-11-1 Nagatacho
Sanno Park Tower
Chiyoda-ku, Tokyo 100-6171
Japan
Tel: (81) 3 5156 6000

Deutsche Bank AG
1 Great Winchester Street
London EC2N 2EQ
United Kingdom
Tel: (44) 20 7545 8000

Deutsche Bank Securities Inc.
The Deutsche Bank Center
1 Columbus Circle
New York, NY 10019
Tel: (1) 212 250 2500