

**Exchanges at Goldman Sachs**  
**Europe's Digital Economy: What's**  
**Driving Europe's Tech Acceleration**  
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**Allison Nathan** Innovations in the US and China have largely overshadowed Europe's tech scene. But now, thanks to supportive government policies and a surge of private capital, the sector is set to take off.

**Lisa Yang (soundbite):** In many sectors, such as e-commerce or online streaming, progress is just accelerated by 3 - 5X compared to 2019, for instance.

**Allison Nathan:** I'm Allison Nathan and this is Exchanges at Goldman Sachs.

[MUSIC INTRO]

**Allison Nathan:** We'll dig into the drivers behind Europe's digital acceleration and who's investing in them. We'll also look at how geopolitical conflicts and a rising rate environment are affecting the pace of digitization.

To do that, I'm joined by two of my colleagues in Goldman Sachs Research who are based in London, Lisa Yang, who leads the European Media and Internet Research team, and Alexander Duval, who covers the technology and hardware industries.

Lisa, Alex, welcome to the program.

**Lisa Yang:** Hi Allison. Thanks for inviting us.

**Alexander Duval:** Thank you so much.

**Allison Nathan:** Lisa, let's first start with the basics. Describe what Europe's digital economy looks like today and where it stands compared to Asia and the US.

**Lisa Yang:** Historically, I don't think Europe has been known for its tech and internet industries. When we think about Europe, we think about its rich industrial heritage. It has global leaders in autos, in luxury goods. It has some of the biggest oil and gas companies in the world. But when it really comes to tech and internet, I just think, yeah, Europe has historically been lagged, especially North America and Asia when it comes to being a home for big tech companies. And clearly it doesn't have super platforms comparable to the FANGS in the US or the BATS in China, for instance.

And I don't think Europe has an innovation hub like Silicon Valley in the US or Shenzhen in China. And so, as a result, I mean, if you think about tech in Europe, it's largely dominated by US players or Asian players. You think about social media by Facebook, search would be by Google, Cloud by Google, Amazon. So, there are just not that many skilled players out there.

**Allison Nathan:** And why do you think that is?

**Lisa Yang:** I think one of the main challenges historically has been Europe's ability to scale startups into major companies. And even though Europe has a big market of 500 million wealthy consumers, bigger than the US, these markets are still very fragmented and very local with a lot of different jurisdictions, different cultures, different languages. So, it hasn't really been a unified market. So, it's just been very difficult for, especially, B to C companies, so consumer-facing companies where scale is very important, it has just been difficult for them to scale. Whereas US and China, as you know, a big, homogenous market, so, the domestic market is sufficient for those companies to scale and become important.

I think there are other factors as well. R & D. R & D in Europe has been lagging other regions. And I would say one exception is on the B to B side where you do have some of the leading players out there like SAP in software or ASML in chip making.

**Allison Nathan:** But you think that we're at a tipping point, essentially. That that was the past and we are, potentially, seeing the tech scene in Europe gaining

momentum, having more traction. Why do you think that is?

**Lisa Yang:** I think that's something we've been really seeing over the last few years. That's the reason why we wrote our report on the rise of Europe's digital economy last year. If you think about it, Europe does have a lot of ingredients to make the digital scene important. It has a large existing talent people. A lot of very good universities. A lot of good research institutions.

I think in the recent years we've seen more and more, I would say, European companies, online companies starting to scale up and being able to compete at the global scale. And just simply if you look at the numbers, the number of unicorns, European tech unicorns have doubled in the space of just two years.

And we think there are a number of reasons that have been driving that. Firstly, I think the pandemic has acted as a big catalyst across many segments. A lot of those companies have gained three to five years' worth of growth in their business plan in a space of just a year. So, they

have been able to scale really, really quickly and achieve even sometimes positive economies, close to positive economics thanks to the boost from the pandemic.

In many sectors, such as e-commerce or online streaming, progress is just accelerated by 3 to 5X compared to 2019, for instance. And we've seen, for instance, in e-commerce in the UK, xFood [PH] shooting up to something like 40 to 50 percent in the space of just a year, which was our analysts' longer-term projection was 50 percent. And we basically got there in 2020 after the pandemic. Other sectors like online education or online autos or online groceries, we think we've gained almost like ten years' worth of penetration in just a year.

**Allison Nathan:** But if the pandemic was a key reason why we saw some of these companies gain scale, how persistent are those dynamics that have helped propel these companies likely to be?

**Lisa Yang:** I think that's a fair question and we continue to see how those COVID winners are panning out in terms of, like, what's normalized growth rate for those names. I

just think COVID has accelerated a lot of the structural shifts we've been seeing for a number of years when it comes to, like, online shopping, food delivery, online gaming, online streaming.

So, I think when it comes to those shifts which have been going on for years and when COVID has just been accelerating those trends, I just don't think we're going to go backwards. Yes, there will be some form of the monetization. As you know, we're going to be spending more time outside. But I think a lot of the share gain and share shifts are sticky. And I think in 2022 we continue to see that. E-commerce growth, for instance, has continued to be positive despite the very tough coms. And I think across other sectors as well, I think the shift to digital has just continued even at the slower pace given they're facing very, very tough coms.

I think at the end of the day it's all about what provides you better customer experience, better convenience, what is more cost efficient. And as long as a shift to online does provide, I think, superiority in terms of convenience and experience, I just think that the shifts will continue.

**Allison Nathan:** Right. And even some of the traditional legacy players that you mentioned: luxury brands, auto makers, have also embraced e-commerce strategies. So, is that potentially another sign that digitization is likely to persist?

**Lisa Yang:** I think that's the piece which I think is almost as interesting as the piece we talked about, about the rise of those digital champions. It's actually that you have a lot of incumbents in Europe with rich, industrial heritage, strong consumer brands, higher barriers to entry. They are actually also embracing the shift to digital, the shift to D to C. And that shift has actually proven to be beneficial for a lot of them because they can see faster growth, even better margins, and consumer behavior online tends to be sticky. And also benefiting from demographic tailwinds given a lot of those consumers embracing online are the millennials.

Clearly, I think, for almost every corporate, whether it's in Europe and I'm sure across the world, the shift to online and D to C is a priority. And if you think about it in 2020,

if you didn't have a presence online, you just couldn't survive, or you couldn't even compete. So, I'm not really surprised to see that a lot of those companies now really place digital and D to C at the heart of their strategies.

**Allison Nathan:** And what are some examples of how these legacy players have embraced technology?

**Lisa Yang:** The number of examples where, actually, some of the incumbents in Europe also tend to be the global leaders in digital, although they're not obviously [PH] well-known for that, and that's why we think it's important to highlight those names, and that's clearly the case in the areas of fashion, luxury, cosmetics. Think about L'Oréal, for instance. They've already achieved 30 percent of their sales via e-commerce. They think they can get to 50 percent in the medium term. And they're the global leader out there. And because they kept investing over the last ten years in tech, we think today it's proving as a significant competitive advantage for them relative to their peers which haven't invested.

But there are many other examples. Like Farfetch in luxury

as well, they're a European player who has been doing extremely well. You have Adidas and Puma in sporting goods. You have [UNINTEL] in classified [PH]. So, a number of incumbents out there actually tend to be global leaders in their specific verticals.

**Allison Nathan:** Alex, let's bring you into the conversation. Obviously, as we're talking about the acceleration in the digital economy in Europe, we're going to need infrastructure. We need an ecosystem to make that happen. So, where are we in terms of the ecosystem today?

**Alexander Duval:** Yeah. Absolutely. And I'd definitely like to highlight a few of the sort of key digital enabling technologies whereas Lisa mentioned actually European companies are very well represented. And those span a number of areas ranging from EUV technology on the semiconductor side to 5G on the infrastructure side, and then a number of other areas besides.

Maybe starting first on EUV lithography, which is extreme ultraviolet lithography. That's critical in facilitating cost-effective production of advanced chips in a range of

applications in the semiconductor landscape. So, for example, logic and memory which are needed respectively for processing and for storage. And the idea here with this advanced lithography is to be able to print the circuitry in such a way that you can have more and more powerful chips at lower and lower prices. And that's very important when we think about things like the Cloud which we now have seen offers highly scalable and cost-effective compute. And that's made it possible for us to have use cases, both in Europe and in other regions, like online collaboration, video games, and of course, e-commerce.

And what we've seen is that some of these smaller companies can be innovative and benefit from all of this compute and storage in a highly scalable way, even if they don't have as much specialized IT infrastructure themselves. So, that's been a huge benefit to the digital economy and will continue to be so in our view.

I think another area as well where we've also seen strong representation in the European arena is on areas like automated driving. That really can be described as technology which allows the car, which effectively is

becoming like a smartphone on wheels, to be able to really do sort of interpretations of the area around it, firstly in order to anticipate possible collisions with other vehicles or pedestrians. But also, over time, actually to drive itself. So, that will drive more and more intelligence into the car.

And then I think finally, I would also highlight collaboration infrastructure. Obviously, during the sort of initial phase of the pandemic, we saw a huge growth in that area. But we do think that there will be a number of enterprises that will want to digitalize and go for a hybrid working model. That won't be the case everywhere universally, but certainly that will be an area where a number of these European companies will play a role.

**Allison Nathan:** And you mentioned smartphone on wheels. Are smartphones, or 5G more broadly, another major growth area?

**Alexander Duval:** Yeah, absolutely. We've got to think about connectivity. And I think here, Europe is extremely well represented when you think about the evolution of wireless infrastructure. In particular, we have 5G network

technology where two of the leading players are European.

And what does 5G bring to us? Well, it allows cost effective, instant information flows between and within the Cloud and the end points of the network. So, we could think about, for example, smartphones and we can think about effective cost per gigabyte reductions over time for the consumer. But also, as we become a bit more futuristic, we can think about industrial IOT, and we can think about connectivity of the enterprise. And as we digitalize, it'll be extremely cost effective to be able to utilize 5G, which by the way, will also be end to end secure. Very important when we think about enterprises' data. But also, we'll have a high degree of responsiveness.

**Allison Nathan:** I heard you say semiconductor chips. And that is a phrase that we grab onto these days because, obviously, there has been so much focus and discussion about the supply chain delays in the wake of the pandemic. So, how are those delays coming into play here? Should we expect that that is going to delay the acceleration in the digital economy in Europe?

**Alexander Duval:** Yeah, absolutely. I mean, I think the backdrop here is that demand for these chips across a whole host of areas, really, ranging from automotive to consumer to industrial, that demand is very strong. And why is that? Well, they're crucial in providing the processing and storage functions that I talked about earlier.

And what we saw is that although currently there's a degree of uncertainty on the broader macro picture, there has been a rebound versus the initial innings of COVID. And that demand really rebounded in a number of the areas where these chips are applicable, faster than the supply was brought online in terms of production of those chips.

So, what we see now is that in order for there to be an easing in the tight supply/demand situation, either demand needs to go down quite rapidly, or you need a significant amount of supply of these semiconductors to come on stream.

Now, we do think decisions that were made a number of

quarters ago to start ramping up supply will actually mean that there is going to be less of a scarcity of these semiconductors. And we do think that that will therefore mean that although inventory levels are very low at the moment across the supply chain, there is going to be some gradual easing that will occur. But we think that's more something we will see in the second half of this calendar year. And it's going to be really more limited to certain pockets, most likely, for example, power semiconductors. But then what we think we will see is towards the end of this year or perhaps early next year, there will be a more significant change where supply and demand will come into balance.

So, what we really see more broadly is a number of the suppliers see demand for their product significantly outstripping what they can supply right now. But as things come more into balance, there will be more opportunity to help debottleneck the situation.

**Allison Nathan:** And I mean, ultimately, securing these supply chains has become a political priority, not just in the wake of the pandemic, but of course given the ongoing

Russia/Ukraine conflict. So, are you seeing policy makers stepping up to think more deliberately about supply chains and what steps are they taking to ensure supply, not just over the course of the next year but over the medium and longer term?

**Alexander Duval:** Yeah, absolutely. I mean, I think, you know, the global geopolitical trends more broadly do suggest we're going to see continuing moves by regions like the United States and Europe to ensure security of supply in key technologies, especially those that help drive the digital economy. And semiconductors are clearly going to be a core part of that.

Now, I'd like to highlight, for example, the European Chips Act. That talks about mobilizing over 40 billion euro of spending in the region. And that's actually similar in size to initiatives that are progressing through the legislature in the US. And I think what's also interesting is that in recent weeks we've seen a major US producer of semis talking about spending over 30 billion euro in investing into European semiconductor production. So, that really does support our view that you're going to see more and more

reshoring initiatives globally. And yes, that will include places like the US. But it will also include investments in places like Europe.

So, in summary, although we don't think it's going to be possible to break the linkages between the different technologies in various regions, we do definitely see these big moves towards investments in new regions related to semiconductor production.

**Allison Nathan:** And what about the investment landscape? Has the growth that you've talked about attracted investors?

**Lisa Yang:** The VC landscape, historically, has been, I would say, lagging. We now think that Europe's VC scene is getting to proper scale. We actually found that Europe attracted almost 92 billion dollars of VC funding last year, which was three times more than in 2020. Although, it's still again lagging. But it's just catching really, really fast.

I think facilitating the rise of Europe's digital economy is regulation. While historically, I think, regulation has been

seen more as a barrier for a lot of those startups. It feels like now the European policy makers and governments are finally, I think, making digital a key part of their policies, alongside the green transition. And I think they are going to be facilitating things like investments into technologies, promoting, I would say, fair competition against the big tech companies in order to promote the scaling up of local European online companies.

**Allison Nathan:** But we are seeing some slow downs. So, we are seeing IPO issuance slowing. We're seeing some renewed reluctance by investors to go into high growth stocks. We obviously are seeing the Fed and other central banks beginning to raise rates amid the high inflation environment and on the market volatility. So, how are you assessing the current environment for investor interest in private and public markets in the tech sector at this point?

**Lisa Yang:** Yeah. I think we've clearly seen the public markets adjusting rapidly, aggressively to the sort of rising rate environment. I mean, if you look at the NASDAQ or the European technology indices, they have obviously corrected. And more specifically, the profitable tech, the

stocks with higher valuations to start with, a lot of the long-duration names, they have been correcting since last September. I think our strategists' European digital economy basket is probably down 50 percent.

But what's interesting is obviously in the private market we haven't seen that happening yet. Obviously, everyone is scrutinizing what's going to happen in the private markets. I mean last year, clearly, it was a record year, I mean, the US and Europe in terms of funding and in terms of VC exit, the size of the rounds. We've seen the number of unicorns increasing by 75 just in Europe to over 200. But clearly, those private markets, at some point, will have to adjust. And historically, there has been a good relationship between activity in the public market and activity in the private market. It's just that there's always a time lag.

Actually, there was an interesting panel last week at the World [UNINTEL] Conference in Europe. And these were panels of VCs or private investors or [UNINTEL] investors, they think typically it's a six-to-nine-month lag between what's happening in the public markets and what's happening in the private markets. But in an environment

where you do have rising inflation, rising rates, I mean, clearly, you're going to start to see some markdowns.

So, yeah, I think there will be some adjustments, especially for companies that would be closer to IPO. I think if you're at the early stages, you're probably not going to see that yet. A lot of investors, when investing in early-stage companies, they probably still have, you know, a five, six, seven-year view. So, you're probably going to continue to see valuation going up or staying high. But in the later stage market, yeah, I think you're probably going to see some potential markdowns or you're just going to see companies staying private for longer. Or if you don't need capital in this environment, you're just probably not going to raise money.

So, I think if you're a public and private investor in this environment, obviously you'll be looking for growth. But growth is not enough. You're going to be looking also for a greater focus on profitability, on [UNINTEL] economics. And that, in turn, will also mean a lot of these private companies, or tech companies in general, will also be more focused on profitability.

**Allison Nathan:** Lisa and Alex, you both just completed conferences that focused on Europe's digital economy. What would you say were the key takeaways from the conferences? And how does that inform where you think the European digital economy will be ten years from now?

**Alexander Duval:** I think firstly on the semiconductor side, clearly you can see as present [PH], continue to argue that we're likely to see a sort of tight demand and supply environment in the short term. And therefore, that would suggest that, probably, the notion of a near-term correction and a lot more supply being available is in the near term seems pretty unlikely. Interestingly, we also had commentary on double ordering. So, that really would suggest, potentially, that the demand is still pretty real.

That really brings me onto my second point, which is that demand and this proliferation related to semiconductor equipment for making these chips is really an area of strength. And that's likely to continue to be the case this year, probably one of the subsegments represented at the conference where we had the strongest dynamics in terms

of longevity of demand. And I think there are a couple of key reasons. Firstly, the need to debottleneck, which pertains to that first point I mentioned in this very tight supply and demand environment. But secondly, the fact that this demand for the equipment is driven not only by volume, but also by the increasing complexity of these semiconductors.

And why are they becoming more complex and more sophisticated? Well, you need to underpin all of these areas that really are drivers of the digital economy. So, if we think about 5G, if we think about virtual reality and the metaverse, if we think about the Cloud, which I mentioned before, if we think about remote collaboration, all of those drive the proliferation of more and more sophisticated tech. And meanwhile, of course, we still have big producers of semiconductors who are engaging in a strong battle to try and be the leaders there.

And then I think the third area I would just highlight relates to video gaming. I think in the areas of video gaming and collaboration, there have been a lot of debates about what growth would look like and how much consumption

there would be by consumers given very tough COVID quants following on from the sort of very strong demand we saw in the initial innings of COVID. And I think, in general, what we saw is companies were highlighting their expectation. But now they have reached that high base in terms of the sort of installed base of uses. But that this would really lead to a rebound or be followed by a rebound in coming years as there really are structural reasons around areas like gaming and hybrid working, which will lead to continued growth over time.

**Allison Nathan:** And Lisa, what were some of your main takeaways from your conference?

**Lisa Yang:** On the consumer side, I think all the speakers at our conference talked about the sort of enduring trends which, really, I think you know, reinforced our view that Europe's digital economy is at a tipping point. And a lot of the structural shifts we talked about, the shift to digital media, commerce, online autos, music streaming, online education, they're just not seeing any major sign of slow down.

And I think the recent conflict in particular, even though it has probably shifted some eyeballs away from certain online channels are people tend to probably be watching more news, that's more like a temporary shift. We haven't seen any companies really being affected by that. I think the only, maybe, exception are some of these online car retailers like Autowon [PH] and Aramis. We have seen some dampening of consumer sentiment.

But particularly the markets that are surrounding the conflict. So, like in Eastern Europe and potentially also a bit of rising in prices impacting consumer demand in markets like the UK or France or Spain. But again, companies see this slowdown more as temporary and will rather result in pent-up demand.

It's just highlighted as well that in certain niche markets like auto and education, in particular, where online penetration is still in its infancy, I mean, the opportunity just remains massive.

**Allison Nathan:** Well, Lisa, Alex, thanks so much for joining us today.

**Lisa Yang:** Thank you, Allison, for having us. It was a pleasure.

**Alexander Duval:** Thanks Allison.

**Allison Nathan:** That concludes this episode of Exchanges at Goldman Sachs. Thanks for listening.

And if you enjoyed this show, we hope you subscribe on Apple Podcasts, Spotify, Stitcher, Google, or wherever you get your podcasts.

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