

The Biggest Loser

Is the European Union on course to become the big loser in the global tech race?

Global analysts say that the United States and China are in a race to achieve the most advanced technological breakthroughs. The winner will likely dominate the global economy through the end of the century. Sometimes India and Japan are mentioned as third players in this fierce global competition. But the European Union is barely mentioned, if at all.

Of course, the European Union is hardly lagging in the race to regulate the tech industry. The European Commission's proposed Digital Markets Act aims at stopping the largest tech platforms from squashing their rivals. In February, the Commission released a plan to shore up its influence in creating global technology standards in areas such as 6G and quantum computing. The Commission is also working on its Digital Services Act, aimed at how tech companies police content on their platforms. And Europe is ahead in the area of data privacy.

But will such efforts actually advance European innovation? European policymakers say one of their big disappointments is that once one of their young tech geniuses starts to gain traction, they often move to Silicon Valley where the tech community is immense and funding is easily found without Europe's regulatory hassles.

Is the European Union on course to become the big tech loser? Or is there a lot more happening on the tech front than has been reported for public consumption?

The views of eleven noted experts.



*Don't write
Europe off yet.*

MARJORY S. BLUMENTHAL

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When people refer to “global tech,” caricatures emerge. They include dominant U.S. big tech companies and big Chinese rivals benefiting from experiences serving a huge, data-rich domestic market. This big rivalry seems to crowd out Europe, especially the countries in the European Union. When it comes to technology, the European Union’s major offering—as a European ambassador lamented to me last year—is regulation, not innovation. But however easy it might be to conclude that, it would miss the bigger picture. Here are three observations why.

First, engineering and manufacturing strengths in several EU countries position them well for the growing Internet of Things. IOT involves cyber-physical systems, which combine information and communication technologies with products that engage the physical world in different ways. In this arena, the European Union is already strong in automated vehicles, for example (and other mobility-related technology).

Second, within the European Union, Estonia has modeled a broad embrace of information and communications technology in public administration and civic life, in particular, gaining efficiencies and broad societal benefits. Although Estonia’s pioneering steps painted a cybersecurity target on the nation, it has become a global leader in developing policies to respond to the challenges that accompany cyber-dependency.

And third, while the European Union’s approaches to data protection seem conservative and constraining, they also force companies to think through options for handling data and other aspects of how they do business. There is seldom only one way to do things, as cloud-service providers bowing to demands for local data storage have demonstrated. The discipline imposed by EU policies could, in the long run, motivate new kinds of innovation shaped by EU sensibilities. In the meantime, the recent calls by big tech firms for comprehensive U.S. privacy policy might

portend a smaller gap in U.S. and EU policy environments sooner rather than later.

Beyond those three observations, there is a mechanism that the European Commission and individual European governments could lean on more: international collaboration in research and development. EU and U.S. researchers collaborate extensively today, building bottom-up, person-to-person connections and sometimes company-to-company ones. Growing that activity, of course, is a goal of the U.S.-EU Trade and Technology Council. If governments can transcend a zero-sum worldview, and if the European Union can boost its support for technology transfer and venture capital, both this fabric of connections and its benefits to the European Union can grow. At a time when uncertainty about U.S. motives and its support for its allies and partners persists, the European Union has an opportunity to put its money where its mouth is. If it does—and that is a big if—the European Union would be able to build on its solid foundations to become a stronger force in tech.



*The future will not be
invented in Europe,
but Europe will still
be able to leverage
innovation to bolster
its economy.*

MARCO ANNUNZIATA

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The global tech competition is more like the Olympics than a single race: it plays out across different disciplines, and in some of these Europe can hold its own. There is little doubt that Europe stands at a significant disadvantage in the development of key cutting-edge technologies, from artificial intelligence to robotics to quantum computing. Its venture capital sector is severely undersized, the emphasis on regulation and legislation discourages risk-taking, and the United States still exerts an irresistible attraction on European academic and entrepreneurial talent. While some European universities remain centers of excellence in specific areas, all this makes it harder to create the virtuous circle between pure academic research and innovation in startups and large tech companies that powers technological progress in the United States. Meanwhile, China’s progress in artificial

intelligence benefits from its willingness to collect and use data with little if any ethical and democratic restraint.

Europe's focus on regulation does have its advantages. Some recent technological advances have demonstrated the potential for major adverse social and health consequences. In the case of social media, for example, curbing its negative impact could yield important benefits. But Europe's more risk-averse culture implies it will likely continue to lag behind in the development of cutting-edge technological innovation. Leading the innovation race requires courageous risk-taking and flexible economic institutions (and the ability to attract global talent). Both carry disadvantages, and Europe's preferences have always leaned towards greater caution and more regulated institutions. It's a very legitimate choice, but it does hold back innovation.

Global tech competition, however, also plays out in the application of novel technologies to the industrial system, and in the digital-industrial revolution Europe has demonstrated that it can hold its own. Here, Europe benefits from a strong tradition of innovation especially in small- and medium-sized manufacturing enterprises, and from a deep pool of skilled manufacturing workers. Many European companies are making rapid progress in the adoption of smart factory technologies, 3D printing, and manufacturing platform strategies. Successful adoption and deployment of these technologies across the industrial system could play a significant part in boosting Europe's role in the global economy.

The future will not be invented in Europe, but Europe will still be able to leverage innovation to bolster its economy and lift living standards.



The national origin of tech innovation is irrelevant.

JAMES E. GLASSMAN

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I'm not sure the national origins of technological innovation matter. Innovations can be adopted anywhere, with the global footprint of business helping to disperse new technologies throughout global markets. For example, when we think of some of the great innovations of modern

times, including the radio, television, robotics, radar, jet engines, laser technology, computers, cell phones, medical advances, and the internet, the origin of the innovation seems less significant for its impact on social welfare than the stage of our economic development and degree of interconnection with the global economy.

I would also note that if China truly succeeds as a powerhouse for technological innovation, this surely would accelerate China's appreciation of intellectual property rights protections.



The lack of a true single market in the European Union may be the biggest obstacle to European competitiveness in tech and advanced manufacturing.

MICHAEL LIND

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The lack of a true single market in the European Union may be the biggest obstacle to European competitiveness in tech and advanced manufacturing. Notwithstanding "small is beautiful" ideology and the romance of startups, size is essential to success in many emerging industries such as artificial intelligence, robotics, advanced manufacturing, and the Internet of Things. These tradable industries tend to be characterized by increasing returns to scale or network effects. The most successful startups grow into immense oligopolies or near-monopolies.

Firms with big home markets tend to have an advantage, in the same way that Olympic champions are more likely to be from populous nations than from smaller countries in which the talent pool and competitive pressure are smaller. The advantage of a large home market explains why, with some exceptions, the largest and most successful multinationals have originated disproportionately in the most populous advanced capitalist nations like the United States, Germany, and Japan. And the importance of a big national home market explains the apparent paradox that the transnationality index of many major multinationals, as calculated by United Nations Conference on

Trade and Development, is lower than one would expect if they were truly global corporations.

At this point, the idea that the nations of the European Union will move toward “ever closer union” is dead. The four freedoms of the European Union—freedom of movement of goods, capital, services, and labor—have produced populist backlashes in many member states. A backlash against cross-border labor mobility, in the case of both EU nationals and immigrants to the European Union, was a major factor in the departure of Britain from the European Union. For the foreseeable future, the hybrid nature of the European economy—partly integrated, partly national—will put the European Union at a disadvantage in the competition to dominate global industries and give birth to global firms with giant nation-states like the United States and China, and perhaps India in the further future.



Europe’s most relevant weakness is the lack of quickly available private venture capital.

THOMAS MIROW
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There is no doubt: in digital technologies, Europe is lagging behind. Alphabet, Amazon, Apple, Meta Platforms, and Microsoft don’t have any European equivalent. Rather, it’s China that has been able to set up comparably successful industrial brands, underpinning its political ambition to become a global tech leader, independent from the West.

However, what does “tech race” really mean? As soon as one looks at the whole picture, from quantum computing to artificial intelligence, from green technologies to pharmaceuticals and biotech, that is, to the broad spectrum of technologies that are supposed to shape our future, things seem far less clear.

Science and research in Europe are widely competitive, as a look at relevant patents proves. A broad-based education system provides for a large share of well-trained, highly skilled people. The influx of experts and high-potential workers from other parts of the world

into Europe has reached new levels. The entrepreneurial “spirit” of young Europeans is growing by the day. And yet, globally successful newcomers in the corporate world like Germany’s BioNTech (founded and led by two immigrants from Turkey) which has developed a state-of-the-art mRNA-based Covid vaccine and partnered with Pfizer for production and distribution, are still way too few.

This doesn’t tell the whole story, though. In Europe, it is rather well-established companies that direct considerable investments into new technologies and thus become engines of technological change. Take the car industry with a “traditional” company like Mercedes that not only got quite far in the demanding development of autonomous driving, but has also just realized a world record with its Vision EQXX model for the longest trip by an electric vehicle on one charge: one thousand kilometers from Stuttgart to the French Riviera, with 15 percent capacity remaining.

Nevertheless, there are weaknesses, obviously. The most relevant is the lack of quickly available private venture capital. Funding opportunities for start-ups in Silicon Valley are still unrivaled—and this is key, as we have seen time and again. Hence, Europe should finally overcome the deplorable fragmentation of its financial markets and establish a comprehensive banking and capital markets union, as so many experts keep suggesting. Only this would generate the financial fire power needed, on short notice, whenever it comes to developing—or seizing—market opportunities for new technologies.



Europe can no longer stay on the sidelines of U.S.-Chinese hostility to enjoy trade benefits with China. Europe will lose or win together with the United States.

KLAUS F. ZIMMERMANN
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Europe is considered to be lagging behind in the global tech race, in particular while striving for an edge in artificial intelligence innovations. While an invention needs a challenge, innovation requires a large responsive market and risk-open societies. A common observation is that Europe, and Germany in particular, has great

inventive capital but less prowess in establishing marketable products than the United States. The recent successful cooperation of Pfizer and BioNTech in the Covid-19 pandemic has shown some elements of this divide. Hence, the established view is that the United States leads in research and development, while Europe relies on talent. A further European deficit is the large dependence on foreign-owned technology providers for artificial intelligence, cloud computing, and 5G technologies.

Under Presidents Obama and Trump, the United States has turned from Europe to Asia to focus on the race with China for the most advanced technological breakthroughs. China has won some legs of this race already. It has announced its challenge to the primacy of the United States (to become number one by 2049), in particular on the technology front. It needs this success to satisfy its enormous need for imported natural resources and nutrition to feed the growing wellbeing of its large population, and to satisfy its ambition for global hegemony.

In the face of a squandered alliance of the United States with Europe, the Chinese Belt and Road Initiative has been a powerful strategy to access resources and to develop a global market to sell powerful technological innovations. China's envisioned success badly depends on technology and trade.

The recent Russian military aggression in Ukraine makes China's strategic partnership with Russia a doubtful venture, damaging the Belt and Road strategy. A world of bipolar globalization with economic decoupling (*Zeitenwende*) may arise, confronting democracies with autocratic regimes: pushing for a reformed transatlantic alliance by developing trade and innovations internally in more intense and more open common markets while regulating and restricting trade and technological exchange elsewhere. This would weaken the global rise in wellbeing, but may change the nature of the technology race considerably. China could become the big loser, at least in terms of its huge ambitions.

Since the United States needs Europe in the upcoming global political bipolar divide of the world, this requires a revival of common trade and technology policies. Europe can no longer stay on the sidelines of U.S.-Chinese hostility to enjoy trade benefits with China.

The potential of Europe is creativity and inventive capital derived from diversity and huge markets. Examples include cooperation of the London-based artificial intelligence venture InstaDeep with Germany's BioNTech to identify and fight dangerous virus variants early on. And the European commitment to accelerating the energy transition implies technological advances. Such a reformed transatlantic alliance makes the question of whether the European Union may be the big loser of the tech race largely irrelevant. Europe will lose or win together with

the United States. However, this alliance should seek strong collaborations with Japan, South Korea, and India.



Even European policymakers are skeptical of the continent's prospects as a hotbed of innovative activity in the tech industry.

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Two important facets of developments in this area—of innovation and tech policy in Europe—have not received the attention they deserve. The first aspect makes the question posed in the prompt less important than it may seem, while the second aspect leads one to suspect that even European policymakers are skeptical of the continent's prospects as a hotbed of innovative activity in the tech industry.

First, the tech industry, like practically every other industry, is not an exercise in zero-sum economics. Whether tech companies start out in Silicon Valley or in Bangalore matters, of course—some of the value they create will be captured by founders and employees at headquarters, and their presence may in turn catalyze the founding and growth of other tech companies. But its consumers, employees, and owners everywhere benefit no matter where a company is founded.

Now, the location of certain companies is of importance for reasons of national security, but even then, the relevant question is whether those companies are based in the West, broadly defined to include East Asian democracies, or at least subject to its legal frameworks and/or effective control.

Second, European policymakers have long expressed an interest in “digitization” and confidence in the arrival of a European “Digital Decade.” But to get a sense of their expectations, it is probably more valuable to analyze the decisions they make than the ambitions and dreams they express.

And when the rubber hit the road, and decisions were made about which companies to subject to conceptually innovative forms of punitive taxation, what did European policymakers, all across the continent, do? They proposed digital service taxes to target large, successful technology

firms. If European policymakers expected those to include European behemoths sometime soon, I am confident they would have chosen a different path. A similar attitude may explain the European Commission's eagerness to leave its mark in the regulatory sphere.



Here are some of the reasons for Europe's poor tech performance.

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A brief look at the STOXX Europe 600 Technology Index is very telling. It has fallen far behind comparable U.S. indices. No European enterprise can challenge the prestigious U.S. big tech companies. There are several reasons for the poor performance of Europe in the global tech race, with at least three being linked to economic policymaking in the European Union.

First, the introduction of the euro in 1999 has initiated the move away from the hard currency policy of the Deutsche Bundesbank, which had created in Germany and other European countries a persistent pressure to push forward efficiency gains and innovation. Given the persistent appreciation pressure on the German and some other European currencies, highly competitive large- and medium-sized enterprises emerged, which became very successful in world markets. However, with the euro area being burdened by the continuous threat of banking and sovereign debt crises, the monetary policy of the European Central Bank has become increasingly loose, thereby paralyzing—via *quasi* soft budget constraints—the innovation capacity of the corporations.

Second, the persistent low and negative interest rate policy of the European Central Bank has compressed the net interest revenues of European banks, which has disturbed the capital allocation in the European bank-based economy. Also, the tightened financial regulations by the European Central Bank and national financial supervision agencies have reduced the capacity of European banks to provide credit to enterprises. Instead, since the outbreak of the European financial crisis, the extensive (Targeted) Longer-term Refinancing Operations of the European

Central Bank have aimed at keeping alive a growing number of zombie corporations.

Third, the European Commission keeps pushing forward a dense web of regulations which have become a substantial burden for economic activity, in particular for the small- and medium-sized enterprises. The goal of transforming the European economy along green and social guidelines is damaging traditionally highly competitive parts of the economy and promotes concentration. The new taxonomy of the European Union is reminiscent of the former central and eastern European planned economies.

Under these circumstances, Hayek's knowledge problem is difficult to resolve. The European Union is unlikely to become a global hub of innovation, neither in information technologies nor in other industrial sectors. It is, thereby, not surprising that capital outflows from the European Union have accelerated, hunting for yield in other parts of the world. To catch up in the global tech race, the European Union would have to turn back to the spirit of economic freedom. As this seems currently unlikely, the race will continue without Europe.



Europe is not bound to be the global tech loser.

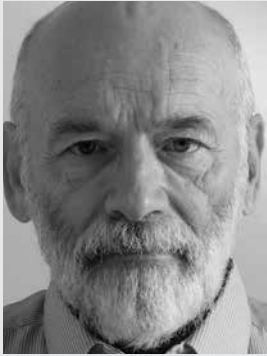
HOLGER SCHMIEDING
Chief Economist, Berenberg

Europe is not the global hotbed for digital innovations. The continent seems unlikely to spawn any tech platform giant on par with those that have risen in the United States and, on their somewhat shielded domestic market, in China. In Europe, a more fractured capital market, a penchant to regulate early rather than late, a culture that values data privacy, and a desire to curtail potential abuses of market power early on often stand in the way. Europe also lacks the giant public investment into military research that has contributed to innovations in the United States. Unlike China, it does not throw vast resources at politically motivated priority programs, either.

With its regulations, the European Union is setting standards well beyond its borders. When it comes to making tech fit for all users with minimal losses in economic

dynamism, Europe seems to be in the global vanguard. Artificial intelligence in Europe cannot be built on the vast quantity of domestic data that China can utilize without any inhibitions due to privacy issues. That is a disadvantage. By the same token, however, Europeans need to be much less afraid of any Orwellian surveillance of their lives and thoughts than the Chinese.

Europe pays a price for its peculiar preferences. But so does the United States in other areas with its sub-optimal systems of mass education and its resulting loss in social mobility. Both the European Union and the United States would be well served by addressing their respective weaknesses. Even without U.S.-style winner-takes-all tech giants, Europe with its ecosystems of highly innovative smaller companies and a workforce well versed in making the best of such innovations need not be a loser in the global tech race.



To sustain the innovativeness of its economy, Europe needs reforms.

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It is true that since World War II, most of the breakthrough innovations have originated in the United States. However, in all innovations rankings, for example, the Global Innovation Index of the World Intellectual Property Organization, Europe goes second, just behind the United States. Several European economies (Switzerland, Sweden, the United Kingdom, Netherlands, Finland, Denmark, Germany, and recently France) belong to the top group. East and Southeast Asia (Korea, Singapore, China, Japan, and Hong Kong but not India, which occupies a much distant position in these rankings) is the third geographical center.

Looking exclusively through the lens of information technologies and the role of digital platforms (where, indeed, the U.S. companies have a dominant position) may lead to simplified conclusions. European companies have contributed to innovations in the pharmaceutical industry, green technologies, aerospace, telecommunications

equipment, the automotive industry, medical equipment, and more. Most recently, European laboratories played an essential role in developing anti-Covid vaccines.

Nevertheless, to sustain the innovativeness of its economy, Europe needs reforms in various policy areas. The European Union must continue removing various internal barriers to the free flow of goods, services, people, and capital, for example by deepening its internal market. Funding for research and innovation on the European level should be substantially increased. The dominance of banks in the European financial sector does not help in research and development funding, especially in small- and medium-sized enterprises, including innovative start-ups. Further progress in developing a Capital Markets Union is critically important for an innovation sector.

EU member states must reform their universities, especially in the eastern and southern parts of the continent. They are underfunded and continue traditions of rigid academic hierarchy and seniority (going back to Middle Ages) that do not offer opportunities to young researchers who have innovative ideas to develop their projects.

The European Union should continue its open trade and investment policy on the external front. Giving up to protectionist pressures (for example, calls for “shortening” global value chains and production “onshoring”) will not help develop European innovations and keep Europe on the top of global innovativeness rankings.



Europe's lagging behind will continue.

JOSEPH V. KENNEDY

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The European Union will continue to lag the United States in new technology. Most countries in the European Union seem primarily concerned about preserving job protections, early retirement ages, and pensions. Although Europeans talk about competing in high-tech industries, they fail to create the conditions for firms to succeed. As a result, the continent has few technology giants, Nokia and Spotify being rare exceptions.

Instead, the European Union has been competing in another sphere: regulation. European officials have attempted to shape the playing field on which U.S. firms compete through regulation and legislation. The General Data Protection Regulation significantly limits the collection and use of data and, in the process, aids firms large enough to absorb the compliance costs. The Digital Markets Act and the Digital Services Act are likely to do the same by substituting regulatory prescriptions for market realities.

The European Union has also attempted to raise taxes on U.S. firms by forcing countries to impose more taxes on tech firms and implementing digital services taxes narrowly aimed at the largest U.S. tech companies. The European Commission has also imposed large antitrust penalties on several big tech companies including almost \$10 billion on Google.

American antitrust law remains firmly based on the Consumer Welfare Principle. In order for regulators to take action, they generally must show that a given business practice would hurt consumers. This principle also protects the markets for labor and innovation. But it does not protect incumbent businesses. In contrast, Europeans seem more concerned with protecting companies from competition, even if innovation and consumers suffer. Yet

sometimes size and high margins are necessary for new technologies to exist.

So far, tech firms have delivered tremendous benefits to consumers, offering products that users value at tens of thousands of dollars for free. Although some business practices raise legitimate concerns, the European approach has imposed costly requirements that harm the pace of innovation. Successful innovation requires a combination of technological change and sound business models which in turn depend on a willingness to experiment. Most business practices should not need a regulator's approval before being implemented and companies should not be punished for success. Rather than try to anticipate the implications of new technology, governments should wait until actual problems arise before taking selective action.

Although each of the tech giants has a dominant position in its main market, they have increasingly made huge investments in other industries where they face fierce competition, such as artificial intelligence, cloud computing, space exploration, and quantum computing. The prospect of being acquired by one of the giants is a major motivation for America's dynamic and growing venture capital market. If this source of innovation in the technologies of the future is choked off, what will replace it? ◆

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