

***“Tapping the Productive Potential of a  
Digitized World”***

Welcome address by

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at the  
Workshop des Global Forum on Productivity

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Dear Ladies and Gentlemen,

I would like to welcome you here at the Federal Ministry for Economic Affairs and Energy, also on behalf of State Secretary Matthias Machnig. He intended to welcome you in person, but unfortunately he had to follow other urgent obligations at short notice and he apologizes.

## **Introduction**

Today we will try to shed light on one of the most puzzling economic questions of our days: In times of rapid digitization in economic and social life, why is productivity so low?

Almost daily, we hear of digital innovations ranging from artificial intelligence and 3D printing, to self-driving vehicles, Big Data applications and distributed ledger technologies (“Block-Chain”).

Given such innovations, economic theory (and maybe even common sense, what sometimes can be the same) would suggest significant productivity and growth effects.

## **“Productivity Puzzle”**

In 1987 Solow formulated his well known paradox: “You can see the *computer age* everywhere but in the productivity statistics.”

These days, we can formulate a new Solow’s Paradox “2.0” saying: “You can see the *digitization age* everywhere but in the productivity statistics.”

When you follow the discussion, you get the impression that economists are divided into two camps: techno-optimist – maybe headed by Carl Frey and Michael Osborn - and techno-pessimists – headed by Larry Summers and Robert Gordon –, arguing over whether or not digitization will create a boost in productivity in the future.

Digitization is cited in the academic argumentation of both, the reason of productivity slowdown as well as “new hope” for a resurgence of productivity dynamics.

According to techno-pessimists, the disruptive process of digitization and the connected massive structural change is causal for new digital technologies to weight on GDP growth and productivity due to fundamental structural changes.

At least in the short term, this “creative destruction” process can be particularly challenging for traditional businesses, where the competitive environment may discourage investments in disruptive innovation in the short run.

However, recent academic research, for example by Nicolas Bloom (Stanford Univ.) and Leonid Kogan (MIT) suggests, that in the long run the negative effect of creative destruction is outweighed by the positive effects of productivity enhancing innovations.

But this reflects the evidence on an aggregate level – for single enterprises or specific sectors these result might be different.

Some economists like Robert Gordon even argue that the productivity effects of the digital revolution will be far less pronounced compared to earlier technical innovations like the steam-engine, electrification, assembly lines or telecommunication. Others, like Brynjolfsson/ McAfee (The Second Maschine age) argue that the disruptive force – and, ultimately, productivity-effects – will be much more pronounced.

### **Measurement challenges**

Additionally, some economists like Hal Varian, Google’s chief economist, and Sir Charles Bean, Deputy Governor at the Bank of England, argue that there is a massive mismeasurement of production, trade and consumption of digital goods and services.

Indeed, the digital economy has created some new measurement challenges for macro-economic statistics and may have exacerbated some older ones, raising concerns about the scope and estimation of GDP.

First of all, there is a certain bias in price measurement with regard to new products or services, quality improvements or availability of digital services free of charge.

Other aspects like international trade in digital services also create new challenges for statistical offices and might bias GDP calculation.

However, the estimated size of this effect seems to be very limited [0,1 to 0,2 percentage points of GDP growth according to joint IMF/OECD analysis] and not sufficient to explain the actual productivity gap.

### **Structural Factors**

So, there must be some more fundamental, structural factors at work causing the productivity slowdown.

What could those factors be?

Well, today's presentations will touch on most, if not all relevant issues from my point of view:

One hampering factor for higher productivity gains might be a lack of complementary investments, like intangible or Knowledge Based Capital (KBC).

Empirical evidence suggests that current low TFP growth is driven by the fact that digitization is still lacking productivity-enhancing complementary investments.

A recent study by ifo Munich [Diermeier/Goecke (2017): Productivity, Technology Diffusion and Digitization, CESifo Forum,] finds high penetration rates for the digitization infrastructure and high technology adoption rates compared to earlier times. Digitization technologies in particular are a driver of this process.

However, follow-up technologies, applied by enterprises and individuals, are not totally diffused yet – according to this study.

Strikingly, a strong change in the diffusion of enterprises ICT empowerment seems to be productivity enhancing with some delay. In that case we could expect productivity to increase in the future.

Two recent studies cover a different issue with view to weak productivity, focusing on rising market power – possibly one of the most relevant factors related to digitization.

Digitization tends to intensify monopolistic trends due to positive network effects and winner-takes-all strategies.

One recent paper by David Autor, John Van Reenen et al. [“The Fall of the Labor Share and the Rise of Superstar Firms” NBER Working Paper No. 23396] finds that rising “superstar firms” enjoy increasing market shares and wide profit margins - in part because of their ability to capitalize on rapid technological change. This evidence is not only valid for the US, but also for OECD countries in Europe like France, Sweden and Germany.

In a different study, Jan De Loeckery and Jan Eeckhout unveil that markups of US companies - as an indicator for price setting power of firms - have soared from 18 percent in 1980 to 67 percent today [“The Rise of Market Power and the Macroeconomic Implications NBER Working Paper No. 23687].

Both papers argue that this rise in market power explains some of the most disconcerting economic and social trends: the long-run decline in labor’s share of income; the decline in low skilled wages; the decline in labor force participation; the reduction in labor market mobility both between firms and across regions; and lastly the slowdown in productivity growth since 2008.

### **The Role of Government**

How can the government facilitate and promote the digital change and release its productive potential, while ensuring social inclusiveness and safeguarding sufficient competition?

Let me highlight the in my opinion five most important points: Infrastructure, proactive regulatory environment, supportive business environment – especially for startups -, digital education and the right balance between data-protection and the possibility to use data – we call et “data sovereignty”.

**First** of all, good networks and internet connections are key for driving forward digital productivity potential. Thus, public investment in high-performance broadband networks is crucial.

Germany still has a long way to go: We spend only 50 percent compared to best performers in broadband infrastructure and ranks 28 out of 32 countries according to EC Commission statistics.

In our “Digital Agenda” the economics ministry proposed an investment fund for gigabit networks with a volume of 10 billion Euro in the period to 2025 in order to promote digital network.

**Second**, as a regulative requirement, the regulatory framework must find a balance between competition, antitrust law and consumer protection legislation in a way that allows firms to deploy digitization for productivity enhancing investment, innovation and new business models, while at the same time preventing abuse of dominant market positions, guarantee an open Internet and protecting the rights of the individual data. We need a dual, proactive competition policy.

Against this background, we introduced an additional transaction value element to **competition law** to allow the antitrust office – the Bundeskartellamt – to examine takeovers of companies with low revenue levels but strategic relevance (i.e. takeover of WhatsApp by Facebook).

In view of the rapid development and disruptive innovation processes, it is not sufficient for governments to wait for regulations to emerge from “normative force of reality”.

We actively need to adapt the regulatory framework to changing circumstances and prevent that regulatory uncertainties impede the adoption of new, productivity enhancing technologies. This is what we call – once again – a proactive approach.

This could be done by setting up “**regulatory test beds**” for new technologies and business models to improve and speed up regulatory learning.

We will present our approaches on such test beds in more detail this afternoon.

**Third** digital start-ups as the driver of the digital transformation need to be promoted. An important precondition for new businesses with high productivity potential to set up is venture capital.

The Federal Government introduced various instruments for founding and expanding innovative companies [e.g. the High-Tech Start-up Fund, the ERP/EIF Fund of Funds, the European Angels Fund, the ERP/EIF Growth Facility, the co-investment fund “COMPARION”].

In total, 2 billion Euro of additional venture capital will be offered by diverse funds and support instruments in coming years.

**Forth**, digital education certainly is key to deploy the productive potential of digitization and reduce social tensions.

New digital work will be more demanding and more complex. Thus, new qualifications and, correspondingly, new training content will be necessary.

According to a recent survey by the Federation of German Industries (BDI), 43 percent of the German “Mittelstand” rank a lack of know how of employees as the main obstacle with regard to digitization.

So, what we need is a *Digital Learning Strategy* covering schools, universities, vocational training and continuing education.

Our goal is that in 2025, every student at **school** will have basic knowledge in information science, how algorithms function and in programming.

**Universities**, the nucleus of digital innovation, will be strengthened by the establishment of additional academic chairs, in particular in MINT areas and information science.

We encourage closer cooperation with business, for example by means of third-party financing and foundations.

Moreover, we support programs for funding business formations at the universities (EXIST).

To align the **dual system of vocational training** with the demands of a digital economy, existing training programs and continuing education programs will be updated in conjunction with management and employee representatives with a view to teaching necessary digital capabilities.

Finally, to promote **continuing education** and lifelong learning, we work with trade unions and employers to create means of more flexible and individualized digital education to provide employees with industry-wide, practical IT-related basic knowledge.

These and other measures, I did not touch upon, are laid out in the Digital Agenda of the German federal government, which is implemented together with the business community, the social partners, civil society and academia.

To conclude: while a boost to long-term growth and productivity could arise from digital transformation and from an increase in the quality of products and services, empirical evidence for now is very ambiguous.

Nevertheless, policies that yield higher returns from education and workforce training, encourage innovation, deepen inclusive information and promote both tangible and intangible capital and a proactive competition policy can potentially have a high impact on future productivity dynamics.

Digitization is the most important driving force behind future productivity progress - let's see if we can find ways to tap the productive potential of a digitized world together.

I am looking forward to interesting discussions and presentations

I am now happy to welcome the executive vice president, chief economist and chief strategy officer of The Conference Board, Bart van Ark, to present his personal views on "The Productivity Paradox of the New Digital Economy".

Dear Mr. van Ark – the floor is yours.

Thank you!